A Pedagogical Design Framework to Engage At-Risk Youth

Proefschrift

ter verkrijging van de graad van doctor
aan de Technische Universiteit Delft,
op gezag van de Rector Magnificus prof.ir. K.C.A.M. Luyben;
voorzitter van het College voor Promoties,
in het openbaar te verdedigen op
donderdag 1 januari 2015 om 12:30 uur

door

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For Sofie (of course!)

"People who submit to the standard of others for the measure of their own personal growth soon apply the same standard to themselves. They no longer have to be put in their place but put themselves into their assigned slots, squeeze themselves into the niche which they have been taught to seek, and in the very process, put their fellows into their places, too, until everybody and everything fits."

(Illich, 1971, p. 40)

Declaration

This dissertation is the result of my own work and includes nothing, which is the outcome of work done in collaboration except where specifically indicated in the text. It has not been previously submitted, in part or whole, to any university of institution for any degree, diploma, or other qualification.

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SUMMARY

The percentage of young people that do not complete compulsory education constitutes a considerable social problem in Europe. The urgency of this problem is revealed by the individual, social and economic consequences. These youngsters have a higher risk of unemployment, face a higher risk of poverty, participate less in re-training, rely more on social support throughout their lives and tend to participate less in elections or other democratic processes. The EU faces a significant challenge to integrate and offer viable opportunities for at-risk youth. Education is often thought as an important contribution to these young people's lives, but despite substantial investments in non-formal and formal educational programs for at-risk youth, the literature is still inconclusive about how to address this growing problem in ways that are effective as well as scalable. Many programs focus on the short-term and teach practical skills, and make use of extrinsic incentives to motivate participation. These approaches often result in a learning experience that may effectively result in a diploma, but overlooks or even undermines the intrinsic motivation to learn, which renders these programs ineffective on the long run, as students do not develop the skills and attitudes necessary for lifelong learning. Programs that have been shown to be more effective, in particular bottom-up local initiatives and large-scale holistic programs, are difficult to scale. On the one hand, comprehensive programs are costly and need specialized experts, youth care, and extensive support and training, while bottom-up initiatives lack documentation and are often highly contextualized, making transfer of approach and replication of results more difficult.

The reAct project was a multilateral project approved under *'Key Action 3: Information and communication technology'* of the Life Long learning program of the European Union (reAct, 2010). The consortium consisted of experts and representatives from educational institutes in six European countries; the Netherlands, Portugal, Spain, Italy, Austria, and Greece. Its aim was to develop a new approach that addresses these two issues (effectiveness and scalability) by i) composing an approach based on theories about intrinsic motivation to learn, and ii) following a design-based research approach that involved local stakeholders. The result is a pedagogical design framework that, rather than an instructional template, contains design principles and guidelines that address local conditions, such as a diversity of needs, skills, and attitudes of participants, and enable participants to design an approach that takes advantage of local opportunities and strengths. The research paid particular attention to the potential role of the Internet (in particular Web 2.0) to facilitate the approach. The main research question that guided our research was ***"How to engage at-risk youth in different educational contexts?"***

We adopted a design-based research approach and case-study research methods to design and evaluate a pedagogical approach in different pilot contexts, in order to

arrive at a pedagogical design framework to engage at-risk learners. The development of the initial 'reAct approach' was approached from three angles. First, a thorough literature review was conducted that addressed both the systemic factors underpinning educational practice, as well as psychological factors related with intrinsic motivation and engagement. Secondly, we investigated two exemplary initiatives in the Netherlands with relevant experience in student-centered learning and teaching of at-risk youth. Thirdly, a stakeholder analysis was conducted that involved interviews with prospective or potential participants (teachers, students, and managers) in the six partner countries. The three perspectives combined resulted in a set of initial principles that constituted the core of the reAct approach. Furthermore, an evaluation framework was developed as well as implementation guidelines to ensure comparability of the different pilots. The implementation of the approach was described in case studies for each implementation context, resulting in eight case studies. A cross-case comparison and analysis was conducted to elicit further improvement of the initial framework and identify opportunities for further research.

The initial reAct framework focused on participatory design, collaboration, and creativity and learner autonomy as potential keys to the reactivation of the interest of learners who have not completed their education. It is based on investigation and consolidated processes, taken from informal learning, in which students *discover* by doing what motivates them, and through this process take a number of cognitive skills that allow them to act autonomously, tackling and understanding the learning situations as new opportunities. Its objective was to foster both a change in attitude towards learning or education, as well as to offer opportunities to develop meaningful skills that allow them to carry on learning throughout their lives.

As a general finding, we can conclude that giving learners a greater degree of autonomy to direct their own learning, providing them with opportunities to develop their creativity, and providing them with opportunities to collaborate both locally and internationally on projects led to increases in their motivation and the development of relevant skills (such as learning skills, sense of initiative, and media literacy) as well as their social and personal development. In several pilots, the effect of the approach on the learners was substantial. On the other hand, the research identified several organizational and pedagogical challenges with respect to the implementation of the reAct approach.

The comprehensive nature of the research allowed a systemic viewpoint to understand the educational process in each of the cases. A synthesis of the case-specific findings has led to the following conclusions, presented along two operational research questions on context and the use of ICT:

How were these principles applied in different educational contexts? The differences in context between cases include the 'institutional framework conditions' (the rules and restrictions regarding the curriculum); involvement of and support by

management; teachers' mindset towards reAct and understanding of the underlying problem (i.e. 'educational system', 'student environment and intelligence', 'society in general'); reported experiences with student-centered learning and/or ICT; common pedagogy (i.e. vocational 'workshop' training as well as subject-oriented and classroom-based teaching); curriculum (vocational topics, high-school orientation training); student type (disengaged students and dropouts, migrants, aspiring young adults); age; cohort size; and ICT infrastructure. The conditions in each of the pilot contexts largely explained the variety of implementation strategies and outcomes, which included the integration level of the reAct approach (how many hours were spent on reAct activities vs 'regular curricular activities'); the support for teachers and recognition of their efforts by management; the learning activities, content choice, and structure imposed or suggested by the teachers during different stages of the pilot; the (type of) assessment and feedback; and ultimately effects on engagement, skills, and overall appreciation of the approach.

What was the value of ICT in relation to the implementation of these principles?
In different pilots, teachers used ICT in different ways, and with different effects. ICT was used for social networking, interaction and collaboration, creative expression (videos, presentations, online posters, magazines), translating, document management, search and explore. An important issue was that in various cases, the use of ICT was seen as *an objective*, rather than as *an instrument* to facilitate the pedagogy, often lead to inappropriate use. Moreover, indiscriminate access to the Internet benefited those students and teachers who were creative, dedicated, and had clearly defined objectives, and worked against those without clear goals, dedication, and skills. Easily distracted students became more distracted, resourceful students became more creative, and socially oriented students became more social. The results highlighted the notion that different ICT activities and tools support different (learning) activities that require different skills, i.e. most students were easy to navigate social-networking sites and use online search engines, which had a positive effect on engagement that lasted one or two weeks. After the associated challenge and novelty dissipated, teachers found themselves unable to support students to advance to more complex (and challenging) tasks using ICT, such as advanced search, complex creative tools, online research, and online collaboration. There was too limited attention and awareness of the specific functions of tools, and the related (meta-cognitive) skills required to make use of these tools effectively. For example, you could argue that Facebook Groups could be used for collaboration in teams, but the use of Facebook Groups by students does not imply they possess effective collaboration skills. Rather than in-depth knowledge of each of the tools, it's more important to understand and be able to transfer these skills. The most common risks and barriers reported include i) Startup time required with each ICT session (logging in, finding passwords, etc.), ii) Distraction (especially among struggling students without clear purpose or goals), iii) Lack of basic ICT skills, iv) Lack of quality tools in a local language (most were in English), v) Facebook

dynamics and lack of (instant) feedback from other students, vi) Connectivity and reliability of the ICT infrastructure.

The research has resulted in an empirically validated approach that acknowledges different organizational and contextual conditions, participants, and objectives. It offers insights and design principles that facilitate the design and implementation of an effective and engaging pedagogical approach. The core of the framework consists of two principles, which are the principle of interest-based learning (*start from students' interests*) and the need to *focus on relevance*. These two principles are intertwined, and should be addressed in unity: students' interests have to be profound in order to keep students engaged. Our proposed framework identifies four dimensions of interest-relevance, including an interest in me (identity, self), interest in others (respect, acknowledgement, friendship, status), and interest in the curriculum (professional or academic interest), and an interest in society (altruism, societal topics).

Four *supporting* principles are proposed to facilitate the core principles, including *Creativity for learning, self-discovery, and engagement*; *Building towards self-guidance and ownership*; *Promoting and coordinating positive interactions*; and *Using ICT wisely*. Finally, we included two organizational principles to address and anticipate on the local educational conditions and stakeholders involved, which were *Convergence through co-creation*; and *Measure and improve*.

Each of the principles is explained using references to the original case studies, and contains a list of practical guidelines or design principles. With regard to the organizational principles, we have proposed an *input-process-output model* to facilitate a consistent and coherent evaluation of the implementation.

Acknowledgements

Thank you… Wim, Pieter, Sofie, Sasha, Amparo, Celia, Nick, etc.

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1 INTRODUCTION

This chapter outlines the complex problem of disengagement from learning and education of at-risk youth. It states the purpose of the research and the main research question, including the operational research questions.

At-risk youth constitute a considerable problem in terms of personal as well as societal consequences, and that this problem becomes even more protruding by the influx of large numbers of young migrants. Politicians and educators recognize this problem, and significant investments are made in educational, training and integration programs targeting at-risk youth. EU programs seem to be predominantly driven by extrinsic incentives (positive and negative), such as monetary incentives, diplomas and certification, social status and improved employability. Although these programs are well designed and carefully implemented, their effects appear to be poor on the long-term, leaving at-risk youth with a negative attitude towards learning itself. Failing to recognize the need to also focus on intrinsic motivation to learn, these programs fail to achieve the goals of helping to shape the future of these youngsters. They may obtain a certificate or temporary employment through these programs, but frequently fall short of providing students with appropriate skills and attitudes to become lifelong learners that help them to cope with changes in the (work-) environment.

This chapter also identifies organizational issues of implementing programs for at-risk youth. Large, comprehensive and holistic programs have been effective, as well as local bottom-up pilots carried by a small group of committed educators. Both these approaches are hard to scale up: the holistic programs are expensive and rely on external input and support (psychologists, counselors), whereas the local initiatives are difficult to replicate, due to their contextualized nature.

Finally, we describe the research context, which was a transnational European project called ‘reAct – re-activating teachers and learners’. Both the project and the

research objectives are stated, resulting in a set of research questions that have guided the research.

1.1 How Europe Deals with At-Risk Youth

The recent global economic crisis has provided an impetus for various policies and programs that support social inclusion, and to provide the right conditions for active engagement with lifelong learning and employment. A considerable concern are 'youth at risk' (also called 'youth left behind', 'marginalized youth', or 'disadvantaged youth'), which OECD identifies as *'young people who have several disadvantages, including the lack of a diploma, an immigrant/minority background, residence in disadvantaged/rural/remote areas, teenage motherhood, and a prison or foster-care background'* (OECD, 2012, p. 66).

Unqualified youth are of particular concern and constitute a considerable social problem in Europe. The urgency of this problem is revealed by its individual, social and economic consequences. Most dropouts, usually with relatively weak social backgrounds, have poor foundational skills, which prevents them from actively, effectively, and productively participating in society. They lack valuable social networks and cannot rely on an financial safety net or (academically) supportive family members, making them risk-averse and not choosing for formal higher education (Werfhorst, 2009). They have a higher risk of long-term unemployment, face a higher risk of poverty, show higher rates of criminal behavior and incarceration, participate less in re-training, rely more on social support throughout their lives and tend to participate less in elections or other democratic processes (Belfield & Levin, 2007b; EC, 2011). In addition to the personal consequences for these dropouts, the costs for society at large are significant. Dropouts pay less taxes and are more reliant on subsidies and public assistance; a research from the USA calculated that each additional high-school graduate would result in almost $400.000 social gains (Belfield & Levin, 2007a). Two other studies from Finland and the Netherlands estimate lifetime costs per dropout would amount to 1.1 and 1.8 million Euros respectively (EC, 2011). The percentage of young people that do not complete compulsory education is especially high in the South where in Portugal 34,9%, Spain 31,7%, Italy 19,6%, and Greece 14,4% of the students drop out of school. But also countries like the Netherlands 11,4% and Austria 10,2% are faced with young people leaving school without a certificate (Eurostat, 2008).[1] In

[1] To address the rationale for the research, we used data available *before* the start of the research in 2009. More recent numbers (2015) reveal an improved situation, but still large portions of the

Europe, youth unemployment (below 25) was 21,4% in 2009 as compared to 16,6% two years earlier (CEDEFOP, 2010). Globally, youth unemployed has increased sharply after 2007 and remains high, with over 75 million unemployed youth in 2014 as compared to 70 million in 2007 (ILO, 2015).

Young migrants constitute another important group at risk to be left behind, because they face similar challenges with respect to competence development and literacy. Language barriers, as well as discrimination, missing family members, poor financial conditions, and cultural differences contribute to the risk of leading a marginalized and insecure life, dependent on public welfare. Family mobility is also linked to poor academic development: children who experience multiple transitional moves have more difficulty in adjusting academically, socially, and emotionally to a new school environment (Rumberger & Lim, 2008). Migrant children, both first and second generation, face higher risks of dropping out of formal or non-formal education (Belfield & Levin, 2007a; EC, 2011; Quintini & Martin, 2006).

1.1.1 Disengagement: definition, rationale, causes, and solutions

Disengagement is considered the primary predictor for students dropping out, both in formal and non-formal education (Furlong & Christenson, 2008; Newmann, Wehlage, & Lamborn, 1992; Steinberg, Brown, & Dornbusch, 1996; Taylor & Parsons, 2011). Disengagement in school is linked with poor grades, low motivation and aspirations, truancy, negative behavior, poor relationships with teachers and other students, and low participation in extra-curricular activities (Newmann et al., 1992; Rumberger & Lim, 2008). Engaging disengaged students is considered *"one of the biggest challenges facing educators, as between 25% and over 66% of students are considered to be disengaged"* (Harris, 2008). It constitutes a central objective in recent educational policies and programs to *"re-engage or reclaim a minority of predominantly socio-economically disadvantaged students at risk of dropping out"* as well as to *"enhance all students' abilities to learn how to learn or to become lifelong learners in a knowledge-based society"* (Taylor & Parsons, 2011, p. 4). Engagement is a multi-level construct addressing academic, behavioral, cognitive, and affective factors:

"Academic engagement is reflected in the amount of time a student spends actually doing schoolwork or related projects in school or at home, the number of credits the

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youth populations in Southern Europe remain unemployed and unqualified (i.e. in Spain 21,9% of population between 18-24 years has at most lower secondary education).
Source: Eurostat (online datacode: edat_lfse_14) - http://ec.europa.eu/eurostat

student has accrued, and the amount of homework completed. Behavioral engagement is reflected in attendance, active participation in classes (e.g., asking questions, participating in discussions), and/or involvement in extracurricular activities Academic and behavioral engagement involves observable, less-inferential indicators. In contrast, cognitive and affective engagements are internal indicators that are less observable. Cognitive engagement, which refers to the extent to which students perceive the relevance of school to future aspirations, is expressed as interest in learning, goal setting, and the self-regulation of performance. Affective engagement refers to a sense of belonging and connection to and support by parents, teachers, and peers." (Furlong & Christenson, 2008, p. 366)

The premise of engagement is simple and self-evident: the more they spend on practice, the more feedback they get, the more adept they become. Engagement is an essential condition for learning and adds to the foundation of skills and attitudes that are of vital importance for leading a happy and productive life, in particular a capacity for continuous learning and personal development (Kuh, 2003). Likewise, lower engagement results in lower satisfaction, and often reinforcing disengagement. A focus on student engagement addresses the 'transfer potential' so learning can actually occur and diminishing disengaging factors reduces the risk of repeated dropping out.

Factors that lead to disengagement at school include *"personal and family issues, including conflict, violence and abuse; high family mobility requiring lots of "fresh starts"; family history of negative experiences with school; lack of transport; parents with physical or mental illness or drug related issues; financial pressures; trouble managing work and school; drug and alcohol issues; and mental health issues"* (Butler, Bond, Drew, Krelle, & Seal, 2005, p. 9). Janosz et al. (1997) ascribe a higher risk of dropping out for boys and students from ethnic minorities and low-SES (socio-economic status) with structural disadvantage (i.e., single-parent family, parents with a low level of education, large family size, other dropouts in the family, etc.) and families *"characterized by a lack of supervision, a permissive parenting style, poor aspirations regarding the schooling of their kids, and negative reactions to school underachievement"* (Janosz et al., 1997, p. 734). An increasingly diverse student body and a host of powerful distractions competing for time and emotional investment from students also play a role in decreased engagement on school (Newmann et al., 1992).

Factors that contribute to a process of disengagement in school are diverse and often beyond the scope or capacity of a school or institution to address. Nonetheless, how education is organized, the pedagogical approach and quality of teaching have a significant influence on both learning outcomes and engagement (Fredricks, Blumenfeld, & Paris, 2004; Furlong & Christenson, 2008; J. Guthrie, 2004; Newmann, 1992). Dropouts and those at-risk of disengaging from education often feel a lack of self-agency, a sense of being acted upon, of not being in control of

one's life and a sense of detachment, of not belonging (Lauxman et al., 2007). Such behavior is often reinforced in the dominant educational system, characterized by mechanized and bureaucratic conditions, with *"many prepackaged developmental expectations and interventions that are useful for sorting types of students"* (Hickman, Bartholomew, Mathwig, & Heinrich, 2008, p. 4). A strong focus on extrinsic incentives and on competition also causes disengagement, especially among those who are less able to keep up under such educational conditions (J. T. Guthrie & Cox, 2001). As noted by Dwyer (1996):

Early leaving is often more related to the push from a negative experience of school than the pull of a job or a clear idea of future pathways to adulthood ... Most of the young people's reasons had to do with wanting to get away from school, especially because the teacher/student relationship was a profoundly negative experience or they found the school environment and work uninteresting and uninspiring (1996, p. 15).

The competitive dynamic sustained in formal education results in a distinction between 'winners and losers' that permeates into society (Sterling, 2003). Negative experiences can create an attitude that discourages individuals to take risk and take responsibility for one's life. The unemployable tend to lack initiative and approach tasks passively, and are particularly in need for skills that allow them to become self-sufficient (Janosz et al., 1997). A key challenge in empowering at-risk youth is therefore increasing the level of agency of the individual, which relates to i) the subjective incentive of a motive resulting from interest or need and ii) the subjective expectation to achieve this goal by one's own action, that is the feeling of control and self-efficacy (A Bandura, 1982).

Central to most methods that address disengagement is a form of personalized learning that takes into account those factors that have led to disengagement or dropout behavior (KPMG, 2009; Redecker et al., 2011). Effective approaches and school policies to increase engagement don't just focus on academic output and behavior, but address the social and interpersonal aspects of school and development of supportive and trustful relationships between and among peers and teachers. In order to increase engagement, teachers try to create a safe learning environment where everyone feels free to ask questions, offers opportunities for dialogue and promotes interaction. Often, summative assessment practices make way for personalized, formative assessment approaches that involve students in a process of co-creation of assessment criteria (J. Douglas Willms, Friesen, & Milton, 2009). To increase the perceived relevance among students, teachers try to relate learning content to real-life, connect with experts, integrate topics across different disciplines, and use various media to convey the learning content using authentic scenarios as opposed to purely theoretical and text-based (Taylor & Parsons, 2011). They allow students to explore topics of interest with a degree of autonomy and beyond the boundaries of school or curriculum, and to discover and collaboratively develop solutions for relevant problems. These approaches, which rely on active

participation and peer-based collaborative learning, are constructivist by nature and demand a less hierarchical teacher-student relationship and strong, respectful relationships in the classroom as well as attention to inter-personal and communication skills (Kreijns, Kirschner, & Jochems, 2003; Sharan & Sharan, 1989). The shift from hierarchical knowledge-transfer to collaborative construction of knowledge changes the locus of control from teacher to learner, which can be favorable as well as detrimental for engagement (P. Kirschner, Martens, & Strijbos, 2004).

Active participation of students facilitates a process of identifying oneself with a the transition process, and the active construction of learning biographies (Walther, Bois-Reymond, & Biggart, 2006). It implies that participants should be provided with rights and resources to make meaningful decisions that guide their transition process. Among other things, this depends on having a choice between different relevant possibilities; building on strengths and interests rather than failure; and providing space for informal and non-formal learning in terms of experimentation and self-determined projects. Active participation follows from a certain degree of autonomy, which means that young people have the right to negotiate their path into adulthood (Pohl & Walther, 2007, p. 552). One of the challenges identified by a large-scale research on programs and policies targeting at-risk youth, was the limited extent to which young people's opinions and ideas were incorporated into these programs (Nevala et al., 2011).

1.1.2 Activation programs in the EU[2]

Failure in formal education often has an adverse effect on self-efficacy and sense of self and, subsequently, many maintain a negative association with learning throughout life. Still, many see formal or institutionalized forms of learning, including second-chance education and job-placement programs, as a *way up* (social class) or *out* (of misery) (EC, 2011; KPMG, 2009). Relative to their engaged peers, at-risk youth are more likely to be motivated by extrinsic factors such as money and independence, and extrinsic incentives are therefore often effective in the short run (Nevala et al., 2011). Current activation programs attend to this issue with a range of measures (trainee contracts, job opportunities, qualifications and direct payment, for example). In addition to extrinsic 'carrots and sticks', programs commonly address individual circumstances, such as family or psychological issues, and offer

[2] The term activation refers to a shift in social policies, through which individuals are given more responsibility for their own social inclusion. (Pohl & Walther, 2007)

personalized guidance and counseling (EC, 2011; Pohl & Walther, 2007). However, few programs attend to the intrinsic motivation to learn, and motivational strategies are often focused on what can be expected from attending or completing a program (positive as well as negative), rather than personal enjoyment or fulfillment of being engaged in learning (Day, Mozuraityte, Redgrave, & McCoshan, 2013; OECD, 2000). The learning itself is not understood as motivating, it is a means to an end.

A focus on outcomes and extrinsic factors can reduce intrinsic motivation to learn as soon as the instrumental goal is achieved or external pressure ceases (Deci, Koestner, & Ryan, 2001; Lepper, Greene, & Nisbett, 1973). Coercing students into learning, for example by providing negative extrinsic incentives (i.e. reducing social allowance), does not lead to improvements in attainment and participation (Sefton-Green, 2012). Intrinsic motivation drives learning (Illeris, 2007), and is an critical component for sustaining policy initiatives addressing at-risk youth (Pohl & Walther, 2007). Intrinsic motivation is associated with educational achievement, and that it is greater when individuals feel personally involved in tasks that include interaction with others in a social environment and they find relevant and meaningful (R. M. Ryan & Deci, 2000a, 2000b). It needs to be addressed to empower at-risk youth to adapt to new conditions in social and professional life.

A lack of focus on intrinsic motivation and the limited integration of psychological research can be (partially) explained by the lack of flexibility in most projects targeting at-risk youth, due to administrative and institutional requirements on teachers and administrators who are *'being bombarded with more and more protocols, procedures, rules, monitoring, and performance management tools'* (Weil, Wildermeersch, Jansen, & Percy-Smith, 2005, p. 167). These demands and the increased focus on 'performance indicators' can even *'contribute to the social exclusion of those who are already on the margins'* (2005, p. 78). 'Soft outcomes' are also important for young people who may face multiple disadvantages, such as for example increased self-awareness and an improved ability to cope with the challenges of daily life. *The above-mentioned issues indicate a need for educational programs and strategies that emphasize intrinsic motivation, agency and ownership to effectively (re-)engage at-risk youth into learning.*

Holistic programs that give participants a variety of options are less common (present in Denmark, Finland, and Slovenia) than workfare activation programs that specifically target students for specific jobs, but appear to be effective in reducing long-term unemployment (Pohl & Walther, 2007). However, such programs require much organization and resources (R. E. Slavin & Madden, 1989). On the other hand, pilot projects are often successful, because they take into account local conditions and are carried by highly committed staff with in-depth understanding of the needs of their target group, but this also makes these projects difficult to replicate (Nevala et al., 2011). The size of the problem of engaging at-risk youth,

not just in Europe but globally, demands for effective solutions that can be scaled across different countries and contexts.

An emphasis on student engagement has significant pedagogical implications and requires a different set of teaching and learning skills that challenge teachers. Most VET teachers traditionally worked alone and concentrated on disseminating knowledge to trainees, whereas today, "*teachers need to work in teams, they have to be able to guide trainees more than just transfer knowledge, and they must also be able to plan, describe and reflect on their own teaching practices*" (Cort, Härkönen, & Volmari, 2004). A focus on collaboration and interaction instead of transmission, adopting different assessment criteria and strategies, giving students autonomy to control or construct learning tasks, and deciding about the use of technology to support teaching and learning, constitute some of the challenges faced by educators (Kearsley & Shneiderman, 1998; Taylor & Parsons, 2011; Zepke & Leach, 2010). At the same time, teachers are faced with an increase in institutional and administrative demands that discourages them from developing new, more personalized approaches (Weil et al., 2005). *The above-mentioned issues demand for a lightweight approach that is both effective and scalable, implying that implementation can be organized and funded locally.*

1.1.3 New Opportunities to Engage Young Learners?

While the dynamics of the traditional classroom or training setting tend to reinforce competition between students, fresh perspectives and new opportunities for personalized and collaborative learning have emerged. The Internet constitutes an important driver for societal, social, and economic change, and at the same time offers new opportunities to deal with change. The variety of free and low-cost online technologies, in particular social media, and readily available information, enable creativity, sharing, self-organization, and collaboration (Mitra, 2014; Richardson, 2010; The New Media Consortium, 2008; Wheeler, Yeomans, & Wheeler, 2008; Wheeler, 2001). For some period of time, these 'new tools' were referred to as 'Web 2.0', because as opposed to 'Web 1.0', these technologies did foster creativity, collaboration, and social interaction (Musser & O'Reilly, 2007). The early Internet was little more than a collection of interconnected documents, without much media, slow to navigate, and accessing or contributing content would require some level of technical skills and ICT resources. With increased accessibility, higher bandwidth, lower costs, and an abundance of freely available ICT that supported creativity without needing technical skills, the transformative expectations for education were high (Brown, 2006; Oblinger & Oblinger, 2005; Tapscott, 2009).

Some thinkers popularized the notion that the Internet fundamentally changes how young people think and act (Prensky, 2001). It is argued that today's kids learn in a non-linear way, clicking and zapping to deal with information overload, and thereby improving their problem solving experience at a young age (Veen, 2007, 2009).

Non-linear thinking and learning patterns oppose the hierarchical, ordered, and sequential ways in which learning content is often presented, and which students find challenging to deal with (Kinchin, Cabot, & Hay, 2008). Jukes and others described learning as a process of discovery characterized by rapid trial-and-error, rather than systematic appraisal, which contrasts with ways how, in traditional learning environments, learning materials are presented and expected to be consumed (Jukes, McCain, & Crockett, 2010). Whether or not we are dealing with young people who *fundamentally* think differently, there is less debate about the notion that we have a generation of learners who, due to their exposure to digital technologies, behave differently, in terms of social interaction, expectations from life and school, and in ways how they use, create and make sense of information (Ainley, Enger, & Searle, 2008).

In response to Prensky and others who propose major and fundamental educational reform to accommodate the skills and interests of digital natives, many researchers argued for a more conservative approach. Bennett et al. argue that such calls *"have been subjected to little critical scrutiny, are undertheorised, and lack a sound empirical basis"* (Bennett, Maton, & Kervin, 2008, p. 776). Generalizations about young people learn are dangerous, they claim, because it does not take into account cognitive differences in young people of different ages and variations within age groups. In a comprehensive analysis of many of the assertions about the influence of ICTs on youth and the readiness of the education system to suit to their social, intellectual, and emotional needs, Rowlands et al. describe how *"much of the impact of ICTs on the young has been overestimated. […] although young people demonstrate an apparent ease and familiarity with computers, they rely heavily on search engines, view rather than read and do not possess the critical and analytical skills to assess the information that they find on the web"* (Rowlands et al., 2008, p. 290). Secondary school students do seem to be adept at routine ICT tasks, but only few feel comfortable with slightly higher-order tasks, such as creating a multi-media presentation, without assistance (Ainley et al., 2008).

However, what the authors found is the following. The information literacy of the 'Google Generation', although apparently at ease with technology, has not improved with the widening access to technology. The speed with which they go through information leaves little time to assess and evaluate the information, either for relevance, accuracy, or authority. Young people find it difficult to assess their own learning needs and to subsequently develop effective information and search strategies. The result is that in communication and search, kids express themselves in natural language rather than investigating which keywords are most relevant to use (2008, p. 295). Andrew Large describes how kids have unsophisticated mental maps of what the Internet is, ignorant of the fact that the Internet is a giant collection of many networks and providers. They rather see the search engine or social network as the primary 'brand' with which they associate the Internet (Large,

2006). Other common concerns include the notion that with the overload of 'facts' and information at their fingertips goes at the expense of creative and independent thinking (Dean & Webb, 2011).

What emerges is a diverse picture that shows that learners and teachers today have an ambiguous relationship with ICTs, which at the same time offer new opportunities for teaching and learning. Although the implications of digital technologies on young people's thinking and behavior have not yet been crystallized, they do represent new opportunities to engage young people in new ways using technologies. A specific interest of this research was to gain more insight into the potential benefits as well as risks and barriers of using ICT to engage at-risk youth into learning and education.

1.2 Research context

Governments, large corporations and politicians across the globe have expressed their commitment to reduce school dropout and to improve educational opportunities for at-risk youth. In the Reauthorization of the Elementary and Secondary Education Act (2010), the President of the USA, Barack Obama, stated the objective that every American should obtain at least a higher secondary certificate. The UN Millennium Development Goals (2000) make a plea for better-educated children as well. In Europe, at the Lisbon 2000 Summit, the member states agreed to becoming the:

most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion. (De La Porte, Pochet, & Room, 2001, p. 2)

In line with the targets established in the Lisbon Agenda (2000), and recently re-affirmed in EU 2020 targets, a major challenge for European Union policy-makers would be to decline the level of school dropout to a maximum average dropout rate of 10% by 2020. To address the diversity of problems and issues underlying early-school leave (ELS) and youth unemployment, a range of social, youth, family, health, local community, employment, and education policies are being developed (EC, 2011). Tackling these problems is high on the political agenda, as reflected in the Europe 2020 flagship initiatives *'Youth on the Move'* and *'Agenda for New Skills and Jobs'*.[3]

[3] More information about these 'flagship' initiatives are to be found here: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/flagship-initiatives/index_en.htm

Vocational Education and Training (VET) and a variety of non-formal educational programs have been developed to facilitate learning appropriate skills, such as entrepreneurship, literacy, and communication skills (Lyche, 2010). These programs have the objective of empowering at-risk youth to find employment, to certify specific skills, or enabling re-entry into the formal education system. Under its 'Youth on the Move' flagship initiative, the EU has set out a commitment to promote and recognize non-formal and informal learning. The OECD argues that *"recognition provides a way to improve equity and strengthen access to further education and to the labour market for disadvantaged minority groups, disaffected youth and older workers who did not have many opportunities for formal learning when they were younger"* (Werquin, 2010, p. 9).

1.2.1 reAct – re-activating teachers and learners

Given the problems and opportunities described above, in 2008 a consortium was formed, consisting of SERVEF (Servicio Valenciano de Empleo y Formación), Delft University of Technology (DUT) and educational institutions and schools from four other European countries with the aim of developing a contemporary approach that focused on (re)-activating disengaged at-risk youth in different formal and non-formal educational contexts. A proposal for a multilateral project was prepared and approved under *'Key Action 3: Information and communication technology'* of the Life Long learning program of the European Union (reAct, 2010). The proposal defined two principal target groups; younger learners between 16 and 24 (vocational actions - Leonardo) and older adults who never completed their compulsory education and are involved in retraining programs (adult learning actions – Grundtvig). It also targeted teachers and trainers involved who form a vital part of the context (adult learning actions – Grundtvig). The project, which was called 'reAct: re-activating teachers and learners', had multiple objectives:

i. The primary objective was to the design and implement a contemporary pedagogical approach for at-risk youth that taps into intrinsic motivation to learn.
ii. A second aim of the approach was to improve their employability and opportunities to participate in society by connecting to lifelong learning practices and addressing relevant learning skills. On the European level, activation policies have emerged from an understanding that, in times of globalization, social integration can only be secured if individuals take responsibility for their own lives and their own labor market value (Pohl & Walther, 2007).
iii. Thirdly, there was a particular interest with regard to the use of web-technologies, and their potential to facilitate the implementation of the pedagogical approach, taking into account that many of the participants,

both students and teachers, had limited to no experience with using ICT in education.

iv. Finally, the size of the problem in Europe demands approaches that are applicable across a wide variety of contexts, rather than just relying on bottom-up pilots across different nations. A particular concern, therefore, is the scalability and sustainability of the approach. This implied that the approach should enable implementation within different institutional and organizational contexts, and acknowledge the diversity in skills and backgrounds among the target population of students and teachers.

1.2.2 Implementation & Research context

The project was implemented in six countries, across a variety of formal and non-formal educational contexts, such as migrant, second-chance and dropout/re-integration educational programs as well as job-placement and re-training. In each country, two consecutive pilots were organized simultaneously. The student-participants (aged 15 -28 years) were at-risk youth from different backgrounds and with varying learning objectives and needs.

Participating teachers had diverse backgrounds as well. As was common for VET in Europe, several of the participating teachers and trainers came into training at-risk youth after a career in a particular trade, without formal pedagogical qualification or background and thus relied on their experience of apprenticeship and school as the basis for their teaching. Other teachers included self-employed professionals working part-time as trainers in non-formal VET as well as fulltime employed teachers in formal education. Few teachers were familiar with new technologies.

The details about the participants and conditions in each of the pilots are described in the case studies in chapter 4.

1.3 Problem Statement and Focus[4]

The key driver for reAct was the significant problem experienced in Europe, and worldwide, with respect to disengaged youth at risk of social exclusion. Many of the problems experienced by these youngsters relate with their home situation, out of reach for formal and non-formal educational institutions. However, school experiences do influence one's decision to drop out. How education is organized,

[4] To improve readability, references have been left out of the problem statement. The section does not contain new elements; rather it concisely summarizes the problem described in previous sections, which do contain references.

how learning is facilitated and the conditions created by teachers in a classroom have a significant impact on how these students perform, what they learn, and on the choice to stay in school, and get a diploma, or not. Failure in school influences students' attitude towards learning as a consequence impacts their employability. The lack of a formal diploma as well as a passive and risk-averse attitude due to limited self-confidence and self-efficacy reduces the chance on leading a self-sufficient, productive, and happy life, and it is unsurprising that many unqualified youth have a higher risk of long-term unemployment, face a higher risk of poverty, show higher rates of criminal behavior and incarceration, participate less in re-training, rely more on social support throughout their lives and tend to participate less in elections or other democratic processes. In addition to the personal consequences for these dropouts, the costs for society at large are significant. They pay fewer taxes and are more reliant on subsidies and public assistance.

Holistic, comprehensive programs that involve family counseling, intensive support and guidance, teacher training, and high quality resources, can be effective but costly and difficult to organize on a large scale. Bottom-up initiatives and local pilots have shown to be effective as well, because they emerge from a specific need, and are carried by dedicated local educators and administrators who have a thorough understanding of the problem. However, what works in one context, may not work in another, which makes it difficult to scale up successful pilots or transfer those to different contexts.

What remains is the dominant approach in Europe to address at-risk youth in activation programs, such as VET training, job-placement programs, second-chance education, and integration programs, including those targeted at migrant youth. Participation in these programs is driven by extrinsic incentives: the prospect of employment, certification or diploma, and recognition (or losing stigma). Many such programs prepare students for specific work, and narrowly focus the learning activities on teaching the skills required to do that job. Rarely, these programs integrate strategies and approaches that focus on intrinsic motivation. Intrinsic motivation drives learning, and is an essential condition for sustaining policy initiatives addressing at-risk youth, as it enables them to adapt to new conditions in social and professional life. Intrinsic motivation is associated with educational achievement, which is greater when individuals feel personally involved in meaningful tasks that include interaction. In this era, a linear life path is less and less common, and life is characterized by change, and adapting to change. This implies making decisions, and creating the conditions for at-risk youth to make their own decisions, especially with regard to learning, is, rather than a pedagogical feature, an economical and social imperative for a happy and self-sufficient life.

While the need to activate these youngsters and offer them opportunities to build a meaningful life is recognized, current approaches show poor effects in getting at risk youth on track, while more effective programs are either very expensive or not

scalable. As the recent economic crisis persists today, and its effects, including high numbers of unemployed and unqualified youth clearly present, approaches are required that are scalable as well as effective.

The Internet and web-based technologies that facilitate creativity, social interaction and collaboration, inquiry-based learning, challenge teachers, because they feel they need to adapt to these new technologies in order to create a relevant learning experience. On the other hand, appropriate use of new technologies can have significant benefits, and may allow teachers in traditional educational contexts to adapt and develop approaches that engage students more effectively and involve them in the learning process. As such, it could be instrumental for new approaches addressing disengaged at-risk youth in the EU.

These observations have led us to formulate the following problem statement:

Currently, there is no framework for activation programs in the EU that combine theoretical concepts and learning affordances of web technologies to design engaging and meaningful learning experiences for at-risk youth in different educational contexts.

1.3.1 Research Objectives

Given the problems stated above, the objective was to design, pilot, and evaluate an approach aimed at engaging at-risk youth in different educational contexts. The approach was supposed to address two key issues that affect the development of quality lifelong learning in Europe. The first of these is the question of learner motivation, and the second is the need for learners to be equipped with skills that allow them to carry on learning throughout their lives.

With the above project objectives in mind, our research objectives were as follows:

i. Firstly, the construction of a set of pedagogical design principles, rooted in theory and practice, focused on intrinsic motivation, student engagement, and lifelong learning;
ii. Secondly, describing the implementation of these principles across different contexts, with a particular focus on the use of ICT. Rich case descriptions offer unique and contextualized insights into the interpretation, application, and effects of these principles;
iii. Thirdly, through a comparative analysis of pilot contexts, results and experiences, a final, context-sensitive design framework will be created that includes pedagogical design principles as well as recommendations for the effective introduction, use, and evaluation of these principles in different educational contexts.

1.3.2 Research Questions

The above-mentioned research objectives have led to the following main research question:

"How to engage at-risk youth in different educational contexts?"

Answering this question required us to gain an understanding of the core concepts related with engagement in education. It has not been the focus of this research to discover a new theory of engagement, rather to use existing theories and insights to develop an approach for engaging at-risk youth. In addition, recent theories and insights shed a light on the skills and attitudes that enable at-risk youth to become self-sufficient lifelong learners. Theoretical perspectives have been used to create an initial framework, which was implemented and evaluated in different educational contexts. The implementation and thorough evaluation of the approach in different contexts, all based on the same initial framework, would enable us to identify favorable and unfavorable conditions for implementation and highlight effective and ineffective strategies to engage the target group. Based on these insights, design principles can be established to support school administrators as well as teachers to develop an approach that is locally relevant and avoids the pedagogical and organizational pitfalls identified in this research. Because the improved framework is context-sensitive, it would be easier to scale across the EU and facilitate local, bottom-up initiatives.

This led us to the following operational research questions:

1) What educational challenges are related with at-risk youth? (ch.1)
2) What are pedagogical design principles to engage at-risk youth? (ch.3)
3) How were these principles applied in different educational contexts? (ch.4&5)
4) What was the value of ICT in relation to the implementation of these principles? (ch.4,5,6)

1.4 Intended Audience

This study is primarily aimed at managers and educators in formal and non-formal education involved in educating at-risk youth. The empirical findings have led to the development of a framework that supports the design of an effective pedagogy that fits within the local conditions (participants, organization, institutions). It describes pedagogical design principles and highlights the potential benefits and risks associated with these principles. This research has resulted in neither a highly theoretical model that may be difficult to implement, nor a pedagogical or organizational blueprint that specifically prescribes specific steps to be taken. Individual case studies offer a more detailed look into implementation, and can offer an even richer picture of the pedagogical or organizational implications of the approach.

Secondly, national and transnational (EU) administrators tasked with devising policies and funding programs that target at-risk youth can benefit from this study. It contains interesting and relevant experiences that concern the organization and sustainability of projects, and the participative nature of our approach could offer a

solution for the scalability problem discussed earlier. Millions of euros are invested per year in these programs, which need to be evaluated in a consistent way. Individual case studies, such as the Italy case study, may offer a new perspective on the relevance of institutional and local regulations on the integration potential of innovative approaches.

Thirdly, researchers involved in educational science, motivation and engagement theory, and in projects addressing at-risk youth, can be inspired by the theoretical as well as practical value of the framework presented in chapter 6. Suggestions for future research, based on our experiences and insights, have been formulated in the final chapter, both to advance the framework as well as to improve the methodological aspects concerned with evaluating projects such as these.

1.5 Organization of the Book

This first chapter explains the complexity of problems regarding at-risk youth in Europe. It describes personal consequences and societal risks, and provides an overview of existing activation programs in Europe, and how many of such initiatives fail to address the problem in a sustainable way. Technology, and in particular the Internet, is described as a driver of societal and educational change that challenges educators, but also offers new opportunities to address the problem in new ways.

The next chapter describes the methodological approach, which is rooted in educational design research (van den Akker, Gravemeijer, McKenney, & Nieveen, 2006). A comparative case study research approach has been chosen to describe individual implementation contexts and outcomes as single units of analysis, and to capture generic patterns of relevant educational phenomena in real settings (Yin, 2003).

The third chapter provides the theoretical underpinning of the initial framework and the set of pedagogical principles through a comprehensive literature review addressing (dis)engagement and lifelong learning practices. In addition, it describes the implementation design and evaluation framework. The fourth chapter contains all the individual case studies, and in the fifth chapter a cross-case comparison is made. Chapter six synthesizes the findings, and feed back these findings in the design of an improved, empirically validated framework for engaging at-risk youth in different educational contexts. In the final chapter, we reflect on the research, its theoretical implications and limitations, and offer suggestions for future research.

2 Methodology and Research Design

In this chapter, we choose *Pragmatism* as our research paradigm, and *Design-Based Research* (DBR) as our research methodology. As an analytical framework, we chose a cross-case analysis, which, as we will argue, keep the contextual conditions intact, while offering opportunities to rise above the contextualized findings and produce pedagogical design principles.

After explaining our research approach, we provide a more detailed description of the research design, including the different phases, instruments, and outcomes. A research design is the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions. It allows the researcher to make inferences concerning causal relations among the variables under investigation. It also addresses the level of generalizability, hence, whether or not the outcomes can be generalized to a wider population or other situations. The research design is like a blueprint of the research, and includes questions to study, data to be collected, instruments and methods to be used, and how the data is interpreted (Yin, 2003).

2.1 Choosing a Research Approach

When considering the research paradigm and methodology, the following factors had to be taken into account.

Improving local practice and understanding: First, the research took place within a multilateral project with a clear goal of directly improving practice in each of the consortium partners' contexts. This meant that the research took place with very practical goals in mind as well as theoretical.

Indirect understanding of, and access to implementation context: The second factor we had to account for when designing the methodology was the indirect access to the research contexts. First, out initial understanding of the local context was limited and would always be less than local partners. Secondly, geographical as well as linguistic barriers would prevent us from directly following or measuring local implementation in each of the contexts.

Design principles and guidelines: Thirdly, within the European context, the approach had more significant and wide-ranging goals, which demanded the development of principles or guidelines that would inform educators in comparable contexts with similar problems.

2.1.1 Choosing a Research Approach

A research paradigm can be understood as a system of beliefs and practices that influence the selection of the questions to be studied as well as the methods that they use to study them (Morgan, 2007). Reinking and Bradley (2007) describe three dominant research approaches and related paradigms on studying interventions in educational contexts (classrooms); experimental, naturalistic, and the more recent approach which they name 'formative/design'. These three approaches, and the related paradigms, are described in the table below:

Table 1 - Educational Research Approaches (Reinking & Bradley, 2007, p. 24)

	Experimental	Naturalistic	Formative/design
Contextual Variation	Controlled, or viewed as nuisance and neutralized by randomization	Studied, analyzed	Studied, analyzed, accommodated
Dominant metaphor(s)	Laboratory	Lens, rhizome, jazz	Ecology, engineering
Stance toward intervention	What is best most of the time?	What is?	What could be?
Operative goal	Comparison (x vs. y)	Socio-cultural and ideologically positioned practice	Selection (x or y) and modification (x1 → x2 → x3 → x4 etc.)
Philosophy/Stance (epistemology)	Positivism, post-positivism, scientific realism	Social constructivism	Pragmatism
Theoretical imperative	General laws and reductionist models	Deep socio-cultural understandings	Workability
Methodological imperative	Internal validity (fidelity)	Interpretative trustworthiness	Ecological validity

	Experimental	Naturalistic	Formative/design
Participants	Pawns	Agents	Partners
Prototypical researcher	Chess-playing statistician	Butterfly-chasing ethnographer	Deal-making, mixed methodologist
Starting point for research	Theory-driven question or hypothesis rooted in a quest for attainable truth	Theory-driven question rooted in socio-cultural awareness	Pedagogical goal connecting theory and practice rooted in values
Relations and contributions to practice	Broad generalizations	Deep reflections	Specific suggestions

Recent decades have seen a rising interest in the 'experimental approach' (first column), particularly randomized controlled trials (RCTs) as a new 'Golden Standard' in educational research, hoping to replicate the successes of post-positivist methodologies in domains such as agriculture and medicine (Christ, 2014; Markauskaite, Freebody, & Irwin, 2011; R. Slavin, 2008). Even, in the USA, public funding agencies sponsoring educational research have been told to favor research proposals that include randomized controlled trials above other approaches (Christ, 2014).

In our research context, the formative/design approach clearly stood out above both the experimental and naturalistic approaches, with some of the reasons summed up below:

i. Firstly, the reAct project purposefully addressed similar, but different educational contexts and situations across different EU countries. It would be impossible to account for all the differences, which made a 'controlled' experimental approach unlikely to succeed. Randomization would also be unlikely to be feasible, due to the limited number of participants per context (10-30 students).

ii. Secondly, supposedly the contexts were comparable; then, significant resources would be required to train local researchers to correctly implement the intervention *and* collect the data. This same argument can be used against adopting a naturalistic approach, and in favor of a formative/design approach. In both the experimental and the naturalistic research approach, we would require 'local researchers' to satisfy 'our research needs', while the formative/design approaches consider local participants as partners who satisfy our research needs as well as their own practical needs. The formative/design approach always has the dual goal of refining both theory and practice (Engestrom, 2011), and thereby offers an incentive for local cooperation and participation.

iii. Thirdly, although some naturalistic approaches embrace the transfer of 'knowledge' and experiences to participants in order to improve practice, the formative/design approaches are more explicit in stating that research should result in actionable principles or knowledge (van den Akker, 1999). Moreover, rather than the 'transfer' of knowledge from researcher to local participant, the design/formative approach fundamentally sees this interaction as a cooperative process in which information and knowledge flows both ways, which, as we have argued, is necessary in our case.

The nature of the reAct, being an 'action-oriented' project, drew us away from both the experimental and naturalistic research approaches. Based on the above arguments, we were drawn towards adopting a design-based research approach rooted in a pragmatic research paradigm.

2.1.2 Pragmatism

Pragmatism, as a philosophy, was introduced by Charles Sanders Peirce (1839–1914), and then further developed by William James (1842–1910), and John Dewey (1859–1952) (Alghamdi & Li, 2013). The emphasis within pragmatism is on 'what works', *"and that truth is relative to the current situation"* (Given, 2008, p. 672). Pragmatism's democratic ideology was very much reflected in the reAct project's objectives and the societal problems it aimed to address. Pragmatism is critical of liberal democracies founded on technocratic principles, and posits that science is "not meant to rule but rather to help in concrete circumstances" (Given, 2008, p. 162). It is aimed at generating useful knowledge through concrete empirical observation. Early pragmatists portrayal of social reality as being in constant flux; knowledge as relative and shaped by multiple and instrumental goals; society as a form of discursive interaction; the self as a biographical project; science as will to meaning and power; and methodology as a form of situated inquiry resonated with more contemporary social and cultural theory thinkers (Given, 2008, p. 160) and seems an appropriate worldview for the complex issues concerning youth at risk in Europe. The ideas about education and educational change vested into the original reAct proposal (and which correctly reflected the ideology carried by its authors; i.e. reAct partners) could be well placed within the Dewey's ideas about reflective moralism, which favors empowerment over authority and traditional beliefs (E. Anderson, 2014). Dewey describes how moral values result from being in relation and interacting with the environment: although our actions are ultimately aimed at 'good life' (what do I value as good? – hedonism, ideals, informed desires), we do not live in isolation, and our actions are therefore constrained and reviewed by 'interested others', which gives rise to the search of principles of 'moral right' that are superior to 'moral good' (what is considered 'right'? – laws that govern behavior, authority, 'Thou shalt not…'). A third strand of moral ethic concerns virtue ethics, in which the quality of character determines morality, based on people's approvals and

disapprovals (e.g. children develop responsibility (and other desirable traits) through praising and disapproving their actions). People use these three sources of 'evidence' to develop moral values: our own (informed) desires, authoritative claims and demands about moral value by other people, and their approvals and disapprovals of our conduct. Pragmatism insists on treating these moral values as hypotheses about social reality, as tools that help us understand and become more aware of a wider set of consequences of our conduct, rather than accepting them as universal, transcendent authoritative criteria on how to live. It does not promote to act purely instinctively or to disregard everything that isn't in accord with one's own beliefs. Quite the opposite: it encourages a critical and reflective mindset that urges people to discover evidence about the good (ibid).

From an epistemological point of view, pragmatism takes a Darwinian understanding of inquiry as a process that helps organisms get a grip on their environment, and thereby provides a more ecological account of knowledge that places truth in context. Pragmatism does not assume one universal 'true world', rather it adopts a more inter-subjective approach based on experiences (Juuti & Lavonen, 2006). Classical pragmatism offers an account of the relation between truth, belief, and inquiry that puts it in line with naturalistic theories of truth (Hookway, 2015). The method of inquiry concerns itself with the identification of goals, interests, values, and consequences and implies that truth of a theory is evaluated by looking at the consequences for practice when the theory is considered true. Inquiry is therefore inherently interactive and contextualized, as suggested by Hilary Putnam (1995):

"For Peirce and Dewey, inquiry is cooperative human interaction with an environment; and both aspects, the active intervention, the active manipulation of the environment, and the cooperation with other human beings, are vital. …Ideas must be put under strain, if they are to prove their worth." (Putnam, 1995, pp. 70–71)

Social equality plays a significant role in Dewey's writings on reflective morality, further emphasizing its relevance in the reAct context. The 'ecological account' of knowledge seems particularly appropriate in a rapidly changing society, with science and technological 'progress' challenging fundamental beliefs and social structures, with migration and increased cultural and religious diversity, and increasing demands for people to deal with these changes and devise shared moral norms to regulate their interactions:

"All of these factors undermine appeals to traditional norms, which are not adapted to changed circumstances, presuppose a consensus that does not exist, and suppress rather than address interpersonal conflict. Nor is resort to traditional authorities any solution. People don't agree on their authority. Moreover, authority itself corrupts people's moral views:

> *It is difficult for a person in a place of authoritative power to avoid supposing that what he wants is right as long as he has power to enforce his demand. And even with the best will in the world, he is likely to be isolated from the real needs of others, and the perils of ignorance are added to those of selfishness. (E 226)*

Moral insights come from the demands of others, not from any individual's isolated reflections. And insights come from all social quarters. Intelligent revision of norms therefore requires practices of moral inquiry that stress mutual responsiveness to others' claims, and social inclusion of all members of society." (E. Anderson, 2014)

According to Dewey, progressive schools and a democratic society are the main institutions to facilitate this process of inquiry into social norms and moral values, the collaborative and open evaluation of their consequences, and to foster the 'extensive sympathy' required for people to adapt to new norms and values in light of new evidence (ibid).

To summarize, we argue that pragmatism offers an appropriate lens to conduct our research for the following reasons:

i. Pragmatism appropriately deals with 'social reality', as it acknowledges the crucial role of experiences and beliefs of teachers and local educators, because that is where the knowledge resides. It sees rigorous scientific methods not as fundamentally different from experience and reflection and places it in the same 'empirical realm' of inquiry: we evolve our first 'philosophy' from the logic of experience. It would be naïve to assume that we would understand and know the situation in each of the implementation contexts and pragmatism urges us therefore to avoid imposing a meta-physical reality about student engagement onto teachers;
ii. Subsequently, interaction with local educators and teachers is an essential element in the inquiry process, which has also clearly been accounted for in pragmatism;
iii. In addition, the interaction should lead to change, because 'truth' is evaluated based on its consequences for reality, implying a research approach that is not descriptive, but seeks to change the learning environment and understanding of its inhabitants – *"Pragmatism – at least Dewey's sort – [..] seemed to be teaching us how to transform the culture that is decaying around us, rather than just how to "cope" with its collapse"* (Sleeper, 1986, p. 1);
iv. Its emphasis on the process of inquiry and moral reflexivity, humanism, critical stance towards authority and knowledge, and the subsequent political philosophy with regards to education and democratic society make it particularly informative for interventions that address young people in a rapidly changing and increasingly culturally diverse society.

2.1.3 Design-based Research

Our approach is rooted in design based research (DBR), which is a systematic but flexible methodology aimed at improving educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings and leading to contextually-sensitive design principles and theories (Wang & Hannafin, 2005). Research approaches engaging design consist of three parties: (a) a designer (e.g. researcher), (b) a practitioner (e.g. teacher), and (c) an artifact (e.g. pedagogical design principles (Juuti & Lavonen, 2006). The main question in design research is *'Will it work?'* rather than, *'Is it valid or true?'* and draws on *'design causality'* to produce knowledge that is both actionable and open to validation (van den Akker et al., 2006).

Design-based research, sometimes referred to as 'development research' falls into the same methodological realm as 'design-research', 'design experiments', 'formative interventions', 'user-design research' and '(emancipatory) action research' (Engestrom, 2011; Herrington & Reeves, 2011; Juuti & Lavonen, 2006). Several differences between the various approaches are explained below (this list is not conclusive), including the role of the local teacher or educators and the theoretical grounding (based on: T. Anderson & Shattuck, 2012; Engestrom, 2011; Juuti & Lavonen, 2006).

User-design research engages practitioners to be responsible for designing the artifact with the objective of improving practice. Similarly, emancipatory action research makes teachers entirely responsible for developing, understanding, and evaluating actions. Anderson and Shattuck further argue that action research is predominantly carried on by the teacher, who thereby fails to benefit from the expertise and energy of a research and design team (T. Anderson & Shattuck, 2012).

User-design research papers rarely offer strong theoretical reflection or grounding, and emphasize the working and technicalities of the designed artefact (Juuti & Lavonen, 2006). In contrast, design experiments primarily focus on the theory development by comparing different designs. The impact on local practice is concerned insofar it contributes to theory development. Barab and Squire argue that the evolution of design principles differentiates design-based research from action research and formative evaluation designs in that *"the design is conceived not just to meet local needs, but to advance a theoretical agenda, to uncover, explore, and confirm theoretical relationships"* (Barab & Squire, 2004, p. 5).

Design-based research emerged from a need to bridge the gap between educational research and educational praxis and to focus on interactions and their effect in real-world contexts. The assumption at the start of the research is that all possibilities and even goals are yet unknown, and can only be uncovered through a cooperative process of inquiry that involves the actual learners and teachers.

Inquiry in DBR requires producing demonstrable changes at the local level, and considers changes in the local contexts as necessary evidence for the viability of a theory (Barab & Squire, 2004). Importantly, as we have discussed in the previous section on Pragmatism, impact on the actual learning experiences forms a crucial part of the justification or adaptation of the theory. In addition to impact on practice and theory building, it often starts or results with the development of design principles that guide, inform, and improve both practice and research in (similar) educational contexts (Herrington & Reeves, 2011).

Design principles represent synthesized and generalized findings from a variety of design cases and experiences that can facilitate new design (Rahimi, 2015). As will become clear in the third chapter, educational systems in the EU are becoming more decentralized, with more autonomy for schools and top-down accountability. Rather than implementing policies and 'innovations' in a top-down manner, this new reality demands for approaches that help local school leaders and educators design and evaluate their own innovative approaches grounded in practice as well as theory. Context-sensitive design principles can help in this process by offering suggestions on how to act and design for engagement. Such design principles are not 'recipes for success' but are used principally *"to help others select and apply the most appropriate substantive and procedural knowledge for specific design and development tasks in their own settings"* (van den Akker et al., 2006, p. 73). It challenges researchers to develop flexibly adaptive theories that remain useful in similar new contexts, or in a context of changing situational variables (i.e. most classrooms).

The inherent participatory nature of DBR avoids a significant pitfall of traditional methods. Through DBR, it is unlikely that interventions are unilaterally are imposed on teachers to be implemented, and that results and understanding disappear with the researcher after the intervention has been researched. Rather, *"a partnership is developed that negotiates the study from initial problem identification, through literature review, to intervention design and construction, implementation, assessment, and to the creation and publication of theoretical and design principles"* (T. Anderson & Shattuck, 2012, p. 17). DBR has proven its value in complex educational environments, the introduction of technologies and innovations in the classroom, interventions that target student engagement, and capacity development with regard to educational innovation (ibid).

Anderson and Shattuck sum up the main characteristics and criteria of a 'quality' design-based research (ibid):

i. Being Situated in a Real Educational Context — The 'real' context provides the sense of theoretical validity to the research as well as a practical and ecological validity;

ii. Focusing on the Design and Testing of a Significant Intervention — the selection and creation of the intervention is a collaborative task that involves

researchers and local practitioners, whereby an effective intervention is formulated as one that is *"able to migrate from our experimental classroom to average class-rooms operated by and for average students and teachers, supported by realistic technological and personal support"* (2012, p. 16).

iii. Using Mixed Methods: DBR is principally agnostic about the choice of methodologies and typically adopts a (pragmatic) mixed-methods approach using a variety of research instruments and techniques.

iv. Involving Multiple Iterations: DBR assumes to have limited knowledge of the actual implementation context and the creation of theory and useful artifacts or interventions therefore often happens through multiple iterations and cycles of refinement. It is also as much about the process as the product.

v. Involving a Collaborative Partnership Between Researchers and Practitioners: Unlike action research, where the educator is both researcher and teacher at the same time, DBR takes a more realistic position and recognizes that teachers are often too busy and ill trained to conduct rigorous research. Similarly, the researcher is often unaware of the complexities of the culture, technology, objectives, and politics of the implementation context to effectively assess the impact of an intervention.

vi. Evolution of Design Principles: Designs evolve from and lead to the development of practical design principles, patterns, and/or grounded theorizing. DBR attaches importance to reflection on the intervention outcomes to produce relevant and practical theoretical knowledge in the form of principles in which the contextual conditions are reflected. Such principles help design more effective interventions and adjust the context to maximize learning.

vii. Practical Impact on Practice: following Pragmatist thought that the value of theory is validated by its impact on reality, DBR intends to create value in the local context of study.

A concise description of the specific methodological phases, methods and instruments are presented in the following section.

2.1.4 The 'Designed' Artifact

In our research, the designed artifact is a design framework that is constituted of i) Pedagogical design principles, which are validated based on their impact on engagement and learning (of skills); ii) Implementation guidelines and suggestions that help educators and manage in similar educational environments with similar target groups to make use of the pedagogical design principles and develop a context-relevant intervention; and iii) A reflection on our methodological and evaluation approach resulting in recommendations and instructions for evaluation of the designed intervention.

2.2 Research Design: A Design Based Case Study Research

Design-based research usually follows an iterative process that is comprised of four phases (van den Akker, 1999):

i. Preliminary investigation: this refers to the identification of a complex real world problem in the research context by researchers and practitioners, usually through literature review; consultation of experts; analysis of available promising examples for related purposes; and case studies of current practices to specify and better understand needs and problems in intended user contexts.
ii. Theoretical embedding: this is a continuation of the preliminary investigation and concerns building a solution (design principles) and connecting that with state-of-the-art theories.
iii. Empirical testing includes the evaluation of the solution through data-collection and analysis, resulting in empirical evidence about the practicality and effectiveness of the intervention in relation to the target group and context.
iv. Documentation, analysis and reflection on process and outcomes to develop new and better design principles and construct theoretical knowledge.

Reeves (2008) proposes similar phases of design based research, but adds emphasis to the participatory and iterative nature of the design and inquiry process. He also adds that the iterative cycles of improvement that are not concluded until 'satisfactory outcomes have been reached by all concerned', which seems unfeasible in the context of reAct.

Analogous to the above phase model is the multi-grounded design research approach proposed by Goldkuhl and Lind (2010). They argue that theoretical, empirical, and internal grounding are necessary to justify design knowledge. Internal grounding involves reflecting and adapting the design knowledge such that it becomes an internally consistent and unified whole.

Yin (2003), in the context of case study research, follows a similar approach with the following stages:

i. Define and design: the theory development, case study selection, and data collection protocol
ii. Prepare, collect, and analyze: conducting the case studies and writing individual reports
iii. Analyze and conclude: drawing cross-case conclusions, modification of theory, developing policy implications, writing cross-case reports.

Based on the above phase/stage/grounding models, we established the following four phases of our research:

Table 2 - Research Phases and Corresponding Chapters

Phase	Goals	Approach + Instruments
1 (§1)	Providing an initial account of the problem.	Preliminary literature review Documentation analysis Collaborative problem definition with local partners (EU proposal)
2 (§3)	Building an initial set of useful pedagogical design principles and implementation guidelines.	Extensive literature review Stakeholders analysis (interviews with students, teachers, managers) Analysis of two exemplary initiatives (interviews and desk research) Collaborative design of the pedagogical principles Collaborative design of evaluation framework
3 (§4,5)	Implementing the approach in different educational contexts in two consecutive pilots, gather and document the empirical evidence for each context.	Case study analysis: Student questionnaires (pre, during, post) Student artifacts and projects Interviews (students, teachers, local partners) Teacher log books Weekly partner meetings (+minutes) Observations in the classroom
4 (§6,7)	Documentation and reflection, resulting in an improved set of pedagogical design principles and implementation guidelines. Suggestions for further research.	Cross-case analysis Reflecting on the research approach and methodology

As can be seen in the above table, we proposed a slightly adapted approach, accounting for the specific constraints and opportunities in our research context. The specific characteristics in our approach discussed in the following sections.

Phase 1 – Collaborative formulation of problem and goals

The original need for a solution to address youth at risk emerged from discussions within a small group of professional educators and educational leaders from Southern European countries – Spain (Valencia), Italy (Fano), and Greece (Evia) – which faced economic downfall and increasing numbers of disillusioned, disengaged and unemployed youth. The problem definition was originally formulated within the context of experiences and within this group, and then further elaborated using literature and documentation from trusted sources such as Eurostat, European Commission, UNESCO, World Bank and others. The basic outline for the research was established early in on the project, including the goals and a core set of questions that needed to be addressed, as a result from close collaboration between all project partners.

Phase 2 – Theoretical and practical embedding and development of the reAct approach

The second phase, as suggested by Van den Akker, originally focused on theoretical grounding and creation of an initial set of principles. In our research, we had the opportunity to build on experiences from an earlier project and used our connections in the educational field to qualitatively investigate another relevant educational initiative. In addition, we had the opportunity to combine our theoretical findings and ideas with the actual needs and ideas expressed by our target groups (teachers and learners) through an extensive stakeholder analysis. Hence, rather than approaching the construction of principles and guidelines from 'just' a theoretical angle, we made use of all these alternative sources of evidence (i.e. exemplary initiatives and stakeholders analysis) to come up with a comprehensive initial framework involving pedagogical design principles, methodological guidelines, and an evaluation approach.

Another reason to involve local partners at an early stage was to anticipate on the limited possibilities for iteration during the actual implementation phases. In order to increase the likelihood of acceptance and 'fit' with respect to local conditions, we decided to integrate insights and ideas from local stakeholders before implementation.

The methods used to conduct the stakeholders analysis as well as the analysis of relevant initiatives are explained in detail in the following section.

Phase 3 – Empirical testing and gathering of evidence

During the empirical grounding phase, we adopted a case study research approach to systematically document and analyze the individual cases and retain and acknowledge the specific contextual conditions that influence implementation. A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, particularly when 'the boundaries between phenomenon and context are not clearly evident' (Yin, 2003). In other words, describing and analyzing the context is an integrative part of the research, and not, as in lab experiments, controlled or minimized as much as possible. According to Yin (2003), most often, the case studies have been used to explain a certain phenomenon or describe causal relationships in real life that are too complex for surveys or experimental strategies. Furthermore, because there are many more variables of interest than data points, the case study inquiry relies on multiple sources of quantitative and qualitative evidence, with data needing to converge in a triangulating fashion.

Case studies need not always include direct, detailed observations as a source of evidence. It is suggested that, to avoid researcher-bias but also benefit from personal experiences, a researcher should aim to combine and contrast direct, subjective evidence and experiences with evidence gathered indirectly (Barab & Squire, 2004).

We were directly involved in just two cases (implementation contexts), and indirectly with respect to the other cases. Thus, this tension between researcher-bias and the potential of using personal experiences was naturally addressed by the configuration of the reAct project. As described in the individual cases, three out of six project partners were teachers or principle/manager in the implementation context (training center, school), and were directly involved in the educational process. The other partners, including us, were not formally affiliated with the school or center (implementation context), but acted as consulting researchers and were present on a weekly basis during the pilots. Our role, as well as the role of the local partners with respect 'own' versus 'the other' cases is illustrated in the table below, which also shows the level of involvement on the local level (partner as 'consultant' or partner as 'teacher/manager'). It also shows that the discussion of experiences and problem-solving was a collaborative, and weekly affair during online meetings. These meetings were well prepared and always started with a short discussion of experiences in each of the contexts, creating a kind of 'global awareness' among the partners about the reAct experiences. The minutes of these meetings were an important data point during the case analysis.

Table 3 - Researcher involvement - combining direct and indirect evidence

	'Own cases' (local)	'Other cases' (non-local)
Researcher	Indirect involvement: Consulting teachers/manager Observation, data collection Comparing experiences own/other cases	- Creating 'mutual awareness' and reflecting on each others' experiences - Discussing progress, planning, next steps, experiences, problems and solutions (weekly partner meetings)
Local partners	Direct involvement (3 partners): Creating/teaching/managing Indirect involvement (2 partners): - Consulting teachers/manager	

Case Study Framework

In case study design often the distinction is made between single and multiple case studies, and holistic and embedded case studies (Yin, 2003). The first distinction addresses the differences in approach between a single case study research versus the situation in which you are able to look at different case studies from the same lens. The latter is often considered more robust, since the outcomes have been drawn from different cases and situations. Single case studies are only appropriate when they are considered to be unusual or rare, critical, or revelatory (ibid).

Holistic versus embedded refers to the idea that the same case study may involve more than one unit of analysis. For example, this happens when attention is given to sub-units. The comprehensive nature of the approach drew us to establish the school

or cohort as the main unit of analysis, with teachers and students (in relation to engagement, skills, attitudes, and appreciation) and organizational support as the main sub-units of analysis.

Student questionnaires collected individual responses on questions (including open questions) addressing participation, appreciation, level of collaboration, frustrations, and more. By aggregating individual survey responses allowed us to picture the situation for the particular group under investigation. Quantitative and qualitative data from questionnaires were combined with several other data sources, including transcripts and summaries of interviews with students and teachers (translated by the project partners), students' projects and artifacts, Facebook chats and discussions, and minutes from the weekly partner meetings. A complete overview of the various data sources and methods and instruments used to answer our research questions are discussed in the next section.

After collecting and analyzing all the data, rich case descriptions were made to facilitate 'analytical generalization', i.e. supporting readers in *"making their own attempts to explore the potential transfer of the research findings to theoretical propositions in relation to their own context"* (van den Akker, 1999, p. 12). Case studies would be created from the data from single pilots, except when two consecutive pilots occurred in largely the same context (same teachers, same school). Then, the differences between the first and the second pilot were highlighted, and the two pilots were merged. Combining data from two similar pilots enabled us to make an internal comparison between the two pilots could be made and also more appropriately addressed the teacher as sub-unit of analysis.

We created the case study framework using a heuristic technique similar to explanation building (Yin, 2003). In short, this technique is a special type of pattern matching that focuses on explaining phenomena, which is to specify a presumed set of causal links about it. As illustrated below, we used an iterative approach to come up with a case study analysis framework that addresses all the relevant factors that ultimately influence the phenomenon under investigation (the reAct framework and ultimately student engagement) *and* accounts for the actual *available data* gathered.

- To identify an initial set of categories, we took an in-depth look into the actual data collected in one implementation context and reflected on its descriptive value in relation to our research questions;
- This initial categorization was then taken as a starting point for the analysis and description of a second case, which was also thoroughly investigated using all available data sources. Adaptations of the original case study framework (categories) were made.
- This was repeated for two more cases, resulting in further refinement of the case study framework to ensure that the available data corresponded with the structure to describe the case studies. Minor revisions were made afterwards.

Ultimately, we settled for a structure for the case descriptions with four essential components: context, implementation, results (impact on skills, attitudes, and engagement), and a reflective part. The first three components are descriptive (What happened?), while the last component is analytical and reflects on connections between conditions in the context, the participants, actual intervention (implementation), and the results (Did it work?):

i. *Context*: The context description included a general description of the center or school (implementation context), and factors and conditions that were likely to have some influence on the implementation of the reAct approach. We described participants (age, experiences, attitudes, goals, perception of the problem), the institutional factors (restrictions, rules, resources), group size, and topics in the curriculum. In addition, if applicable, the main differences between two pilots constituting the case are described.

ii. *Implementation*: The part on implementation addressed organizational and pedagogical choices and features per pilot. The organizational part included the integration level (how many hours per week were invested in implementing the approach), teacher support and training, role of the manager, and organizational resources to support the implementation. The pedagogical part included the local interpretation and design of the approach (intervention) in terms of learning activities, role of the students, didactic principles and features, assessment and feedback, and the use of ICT.

iii. *Results:* This section described changes in student engagement over time, attitudes, and skills. Also, it describes the impact on teachers, and how they have changed perspectives or their practice in the course of the pilot.

iv. *Conclusions & Reflection*: Summarizing approach and reflecting on relevant contextual conditions, organizational factors, pedagogical design and implementation approach in relation with student engagement and other results.

The diagram below comprehensively illustrates the approach.

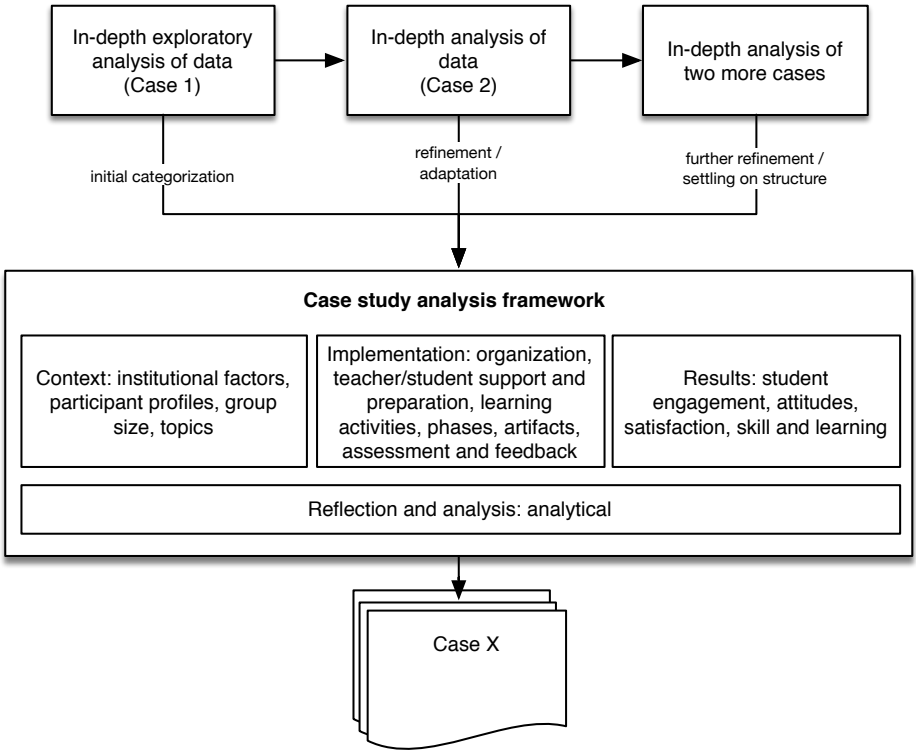

Figure 1 - Building a Case Study Analysis Framework

Data Collection

Case study research methodology relies on multiple sources of information, for instance documentation, archival records, interviews, direct observations, participant observation and physical artifacts. Relevant data are gathered, organized, evaluated, and generalized (Yin, 2003). Through methodical triangulation, i.e. using more than one method to gather data, the validity of the research is increased. In our research context, this was both essential, as for most cases, we depended on the willingness and expertise of our partners and teachers to conduct the data collection; and logical, as the implementation itself would already result in numerous data points of different kinds. Only through the combination of different sources of data a comprehensive and reliable image can be created of the actual implementation and outcomes per context. The table below provides an overview all the data sources and research methods and instruments we have used to address our research needs expressed in the previous section. Due to local circumstances and personal (extra) efforts by partners, there were slight differences in the actual data gathered between cases. The actual instruments and methods deployed per case are described in each of the case studies.

Table 4 – Research methods and instruments

Research methods & instruments	Description	Context	Implementation	Results

Research methods & instruments	Description	Context	Implementation	Results
Interviews	Appendix I: Stakeholder Analysis – interviews with potential and prospective participants (managers, teachers, students) Appendix II: Semi-structured interviews with partners about implementation context (preparation/design). Appendix III: Semi-structured interviews with partners after the second pilot (evaluation). Appendix IV: Semi-structured and open interviews with teachers reflecting on outcomes (post). Appendix VII: Focus group sessions and interviews with students about experiences after each pilot (using questionnaire data).	x	x	x
Questionnaires	Appendix V: Teacher questionnaires (P2) – pre-during-post Appendix VIII: Student questionnaire (P1 and P2) – pre-during-post Appendix IX: Partner evaluation questionnaire after the second pilot	x	x	x
Artifacts, student projects and presentations, wiki page	The artifacts and student projects offered were a qualitative source of information that reflected technology used, didactic choices, students' interests, level of collaboration, conformity to the formal curriculum and more. Their 'quality' was assessed as a measure of effort put into it by students. The number of projects uploaded to the wiki was an indicator for activity per cohort.		x	x
Teacher log books	Appendix VI: A rich source of information containing teacher logs about the implementation. Used for qualitative description of the approach and teachers' perceptions of its impact.		x	x
Partner meetings log/minutes	Appendix IX: Each week, pilot experiences, highlights, pedagogical and organizational issues and intermediate results were discussed and logged into the meeting minutes. Document contains 35.475 words.		x	x
Personal notes	Partners had regular informal meetings with involved teachers and managers to discuss the approach and prepare for next steps. Some partners kept personal notes that were used as a data source for pilot reports.	x	x	x

Research methods & instruments	Description	Context	Implementation	Results
Facebook group(s) content (chat, links, discussions)	There was a general FB group for all participants during the entire pilot, and students/teachers started their own local FB groups. Focus on what was being shared, team formation, interaction and activity level, and collaboration.		x	x
Observations during class hours	We observed and assisted during several class hours in both pilots, as did two other project partners. Three project partners were more directly involved as teacher or manager inside the location and were present most of the time. Notes were made and pictures were taken.		x	x
Internet, websites	Websites about the institutions and schools.	x		
Internal communication and documentation	Relevant internal communication was preserved and used (Basecamp messages and email). These contained additional examples, questions, and issues during the pilot.		x	x

All partners were supported in making a pilot implementation report after each pilot, using all the available data sources and following a structured format that was established and accepted by all partners. The pilot report format is described in the next chapter, under section 3.6.4. Both the original data (see above table) and the pilot reports were used as input for this research.

Phase 4 – Data Analysis

A general analytic strategy for data analysis shows the priorities on what to analyze and why. Two approaches to developing such a strategy are common: relying on theoretical propositions and developing a case description (when theoretical propositions are absent). In our research, the comprehensive nature of the approach as well as the many 'unknowns' with regard to the implementation contexts made it difficult to make explicit theoretical propositions. Moreover, the principles were diverse, and at the start of the project, it was an open question which of these principles were easy to implement, which would effectively address disengagement or specific attitudes and skills and under which circumstances, what background and skills were needed, or how these principles interrelated. There were too many open questions and the expectation was that an exploratory approach would be appropriate.

During the analysis (but also for other purposes of the study), we made extensive use of 'mind-mapping', which is an analytical technique that can be used to organize information in a visual manner.[5] A mind map is often created around a single concept, drawn as an image in the center of a blank page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those. It is a non-linear but hierarchical constructive technique that facilitates creating categories and sub-categories as well as relations between concepts. It has even been found that it significantly improves understanding (Cunningham, 2005), facilitates constructing knowledge and knowledge retention more effectively than reading and summarizing (Nesbit & Adesope, 2006). Because we used the digital, open source tool 'Freemind', we were able to quickly re-organize, delete, and combine information snippets and ideas into a comprehensive and coherent map. As compared to other techniques we used (including TAMS (Text Analysis Markup System); a qualitative analysis tool to identify themes in across a diversity of data sources (web pages, interviews, field notes, videos), mind-mapping was by far the best choice: easy to use, very fast, and a very natural way of summarizing and analyzing concepts and identifying interesting relationships. One of the mindmaps is shown below (reduced, otherwise it would not fit), which also illustrates the process of creating the initial case study framework based on the Italy pilots. Although the rough categorization remained more or less the same, to get to a more specific and detailed initial case study framework, four iterations were required that involved combining and re-arranging data, questioning the validity of individual data points, completeness of the data, annotating questions and ambiguous results (for further consultation with the partner), and describing what the data actually 'told' us about the implementation and outcomes of this particular case. The third and fourth iteration were done after the framework established after the second iteration was applied to other cases, which gave new insights that were 'fed back' into the Italian case study. All case descriptions in this study have an accompanying mind-map (not shared due to privacy concerns of the containing data).

[5] See https://en.wikipedia.org/wiki/Mind_map for more information and a list of available tools.

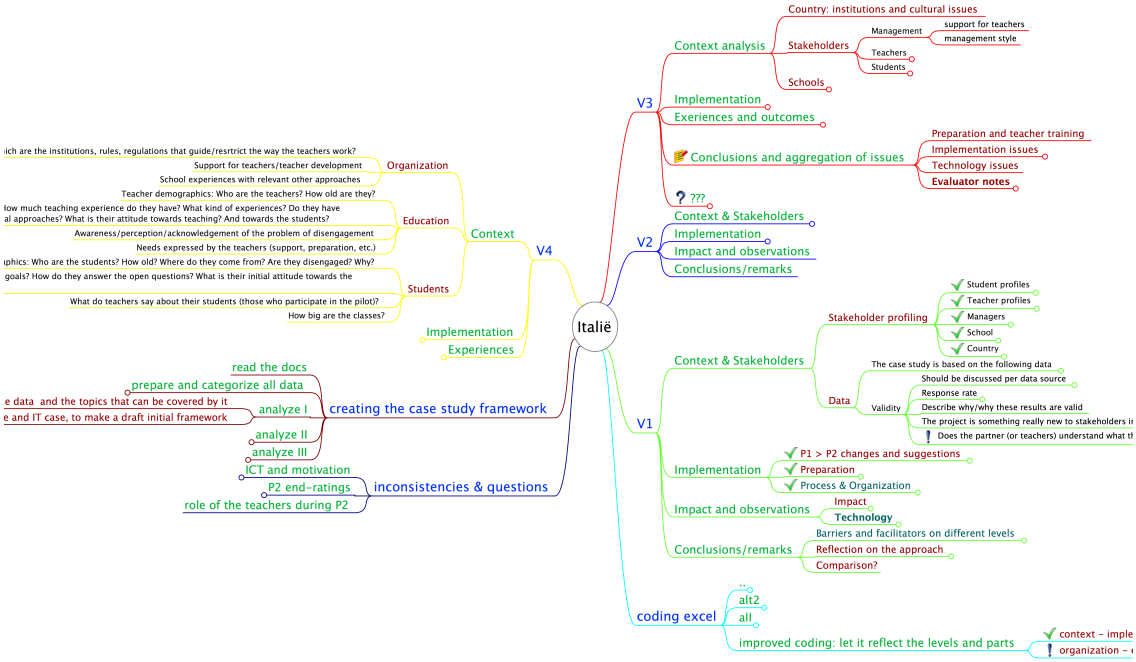

Figure 2 – Example mind-map showing the analysis of the Italian pilots and the development of the initial case study framework

As for the quantitative data, we used various simple descriptive analytics to summarize outcomes, perceptions, and interpretations, and to compare those with other cases using Excel and R. However, recognizing that these quantitative data could only be understood in the context of the pilot, we were very careful to draw any inferences from this alone.

Two other important tools that were used for data analysis were F5 (an open-source tool to transcribe interviews and highlight interesting parts and a Google Script that uses Google Translate to automatically translate open question entries within Google Spreadsheet.

When all cases were finished, we conducted a cross-case analysis by tabulating the case data, using the same categories that were established for the case study analysis framework. Then, using mind-maps, a comparative analysis was conducted, leading to theoretical insights and improvements over the original approach. The outcomes were contrasted with our initial set of principles and additional literature was found to explain the most interesting phenomena.

The entire research flow is illustrated by the diagram below, whereas the red delineated boxes indicate parts of the research that were done in collaboration with partners, or where we, to a significant degree, relied on our partners to collect or interpret the research data.

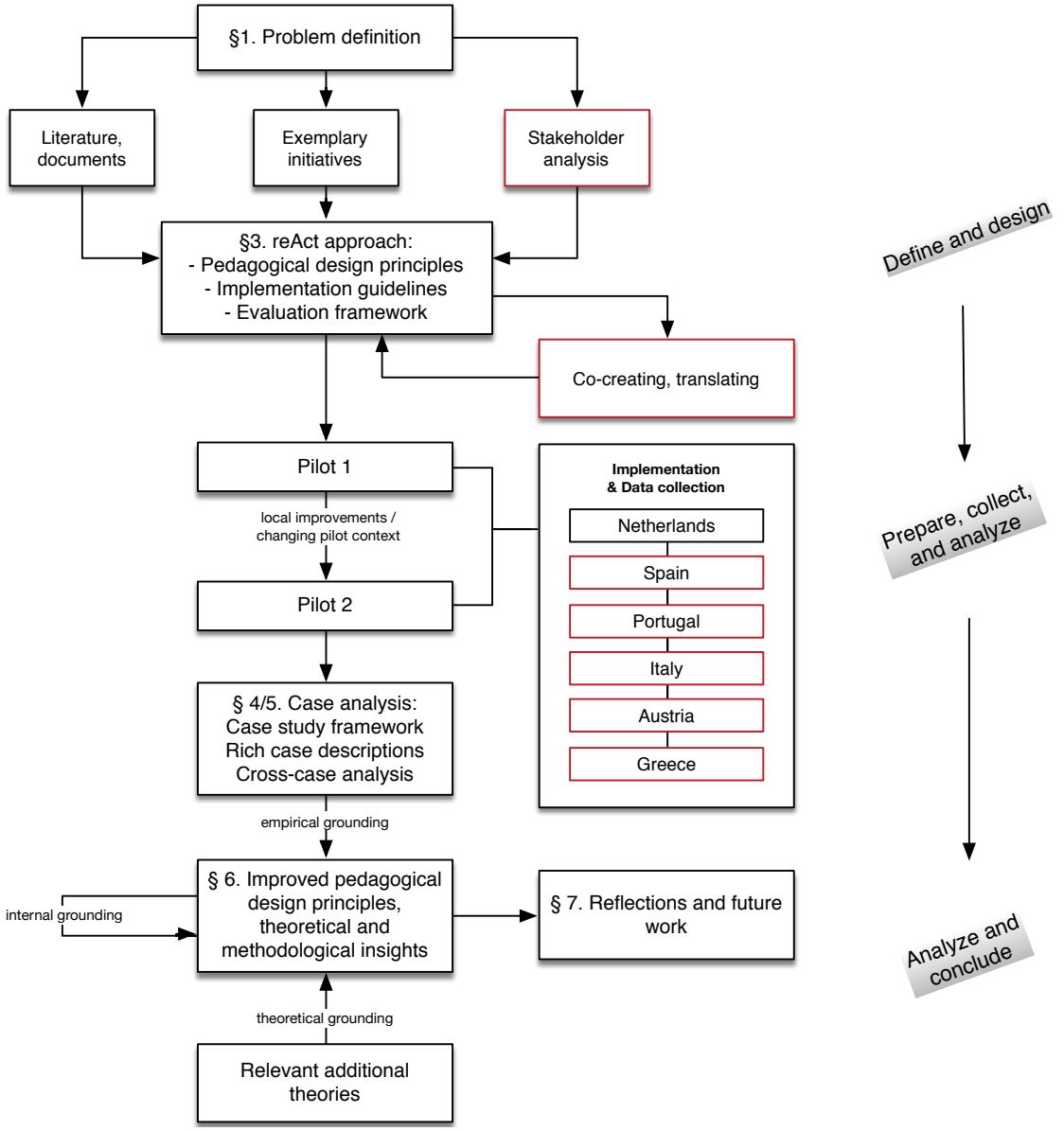

Figure 3 - Research flow

2.3 Collaborative and Iterative Nature of the Research

As can be seen in the research setup, in our research we relied on contributions of partners, their implementation, ideas and support. In addition, interaction and collaboration with local partners is a core part of the methodological approach. It helps to highlight a number of deliberations and experiences with regard to the organizational project-structure (which was a typical EU project) and how that influenced the research:

- **Less control**. In this research, we were only able to directly influence and experience the implementation of the approach in two pilots in the Netherlands. Geographical, cultural, and linguistic barriers as well as a lack of local knowledge created a dependent relationship with local partners and participants.

- **Context**. With diminished control over the setup and execution (or even interpretation) of the theoretical framework, the relevance of context and knowledge about application becomes even more important. The data cannot be expected to be comparable across pilot contexts, but information about the local contexts would allow us (and others) to interpret the outcomes and infer more general conclusions from it.
- **Comprehensive approach**. The above has led us to adopt a more holistic research approach that focused on the interpretation of the model and its application in local contexts, rather than narrowly focusing on the effects of the approach on student engagement. It was also considered a more interesting research focus, because the intention was not to find new principles, but to test existing knowledge and theories in new contexts: interpretation and implementation are then essential to understand the outcomes.

One of the clear limitations of the research was that there was only room for one real iteration of the approach. The duration of the project allowed us to experiment with the approach for one year, which meant two consecutive semesters. There was no time for small-scale preparatory cycles, but on the other hand, the approach did not emerge from just theory: it *was* based on previous projects.

Juuti and Lavonen suggest that *"designers should accept the situation of uncertainty of the strategy and they should be ready to change totally tentative strategy. This emphasises the seeking of the dynamic balance through iterative design and testing - phases."* (Juuti & Lavonen, 2006, p. 60)

Due to limited time and resources, and also methodological reasons (less 'comparability'), we would not radically change the approach after the first pilot; however, we did facilitate for local interpretation and collaborative design as follows:

i. **Stakeholder analysis**. In order to strengthen and improve the theoretically grounded principles and ideas, all partners executed a stakeholder analysis that assessed the problem from a local perspective and resulted in suggestions and requirements for the approach.

ii. **Discussions and meetings**. Weekly online meetings before, during, and after the project discussing all relevant issues, brainstorming solutions, and if necessary, adapting the planning or elements in the approach.

iii. **Co-creation**. Using Google Docs, local partners were invited to contribute to the initial reAct approach. Local teachers were not involved in this process due to two reasons: it was yet unknown who was going to participate (the initial design had to be ready first to propose to interested teachers) and only few spoke sufficient English to effectively participate in the co-creation process. Nonetheless, they were interviewed and asked for suggestions by partners. The co-creation process was directed at designing the initial reAct

approach, the implementation guidelines, pilot structure and content (i.e. teacher training, familiarization phase), and the evaluation framework (including the questionnaire- and interview-questions).

iv. **Translating**. Many supporting documentation was produced, as well as questionnaires and other evaluation materials. The act of 'translating' was considered very useful, because it required interpretation and therefore facilitated deeper understanding of the approach.

v. **Generic principles + specific examples**. As will become clear in the following chapter, our aim was to develop principles that were generic enough to account for local differences, while providing useful examples that allowed teachers to design their own learning activities.

3 CONSTRUCTING THE REACT APPROACH

In this chapter, 'reAct approach' and 'reAct framework' are used inter-changeably. The difference between the two is that the 'approach' refers to the more general and often *implicit* thoughts, philosophies, and ideas that underpinned the reAct project, while the *explicit* translation into pedagogical design principles, implementation design, and evaluation framework constitute the reAct framework. Clearly, the idea is that the framework explicitly supports local partners and teachers to implement reAct (practice), which in turn increases local understanding of its more fundamental ideas (theory). Later, in chapter 6, this framework will be revised based on the comparative analysis of all of the cases.

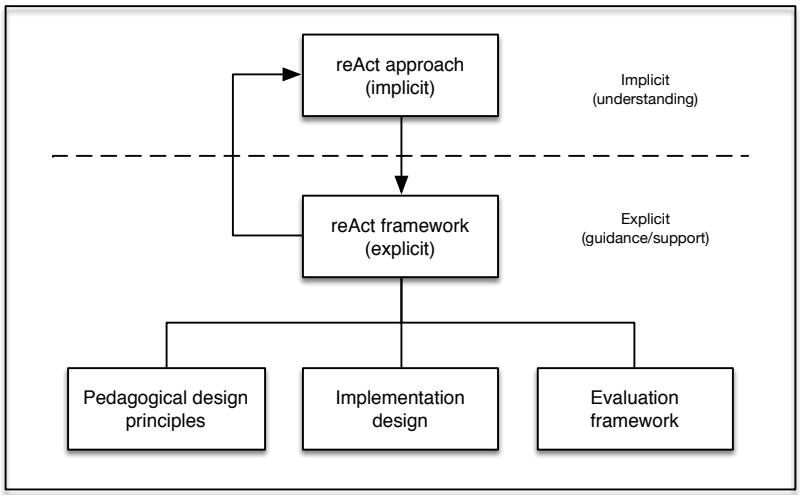

Figure 4 – reAct approach versus reAct framework

In the first chapter, major challenges were identified regarding current approaches and programs addressing at-risk youth of social exclusion. Our focus is on

educational programs that aim to provide at-risk youth with better opportunities to lead more productive and satisfactory lives. Many of these programs focus on improving employability through job-placement programs or vocational training and education. However, the focus on practice and the use of extrinsic incentives to encourage (and sometimes enforce) participation renders these programs only effective on the short term (Vries & Hennis, 2013; Vries, Santos, & Hennis, 2012). These programs offer incentives for participation, such as a certificate, qualification, and even employment, but they often do not address intrinsic desire to learn. This is problematic, because many participants, especially dropouts, carry with them a negative association with learning itself, due to failure in formal education. In addition, if students fail to learn how to learn, they are less able to cope with and adapt to changing labor demands and to become self-sufficient. A need for a different approach to engage at-risk youth in educational contexts was identified in chapter one.

Although it has underlying causes, disengagement is a problem in and of itself: learners who are spending time on school, learning rather *for school* than for themselves, or completely disengage from formal education, develop a negative association with 'the idea of learning' and do not acquire the knowledge, attitudes and skills for further education and employment. Contrasting to that, engaged learners take pride in what they achieve in school, and make a psychological investment in learning, which is focused on understanding the content, rather than focused on earning the formal indicators of success (i.e. diplomas and grades) (Newmann, 1992). It is engagement with learning that leads to higher understanding and developing a rich and fertile ground for success in education, work, and life, whether you drop out or not. Engaged learners find their learning more rewarding, develop relevant academic, cognitive and social skills and behaviors, are better able and more likely to pursue higher education, and achieve better results (Marks, 2000; Newmann et al., 1992; Shernoff, Csikszentmihalyi, Shneider, & Shernoff, 2003).

This chapter describes how we developed the original reAct approach. The development of the reAct framework was approached from three complementary directions:

1) *A literature review* (§3.1, §3.2, §3.3). A critical look at the formal educational system resulted in the generic conclusion to develop an approach based on trust on all levels (administration, teachers, learners). Furthermore, a review of literature on lifelong learning and the underlying philosophies resulted in a number of relevant skills, attitudes and pedagogical implications. These include a focus on identity and agency, collaboration, and creativity, supported through Web 2.0 tools. Then, theories on motivation and engagement were inspected, which described a number of relevant pedagogical principles and criteria.

2) *Examples of best practice* (§3.4) were investigated for two reasons. The first reason was to better understand the practical implications of the concepts and theories described in literature. Secondly, in doing so, we were able to provide pedagogical principles, and relevant ideas and suggestions to participating teachers. The examples could therefore contribute to local implementation and design of activities.
3) *A participatory approach* (§3.6) to facilitate local implementation, ensuring the appropriateness of the reAct framework, and fostering a sense of responsibility and ownership among local participants. Two measures were taken. First, all partners executed a stakeholder analysis, resulting in a better picture of the local situation, the target group, and issues and criteria brought up by them. Secondly, every local partner in the project took part in a co-creation process (details can be read in chapter 2.3).

The diagram below captures the creation process of the reAct framework, the core of which comprises of a set of pedagogical design principles, thereby answering the second research question, which was **"What are pedagogical design principles to engage at-risk youth?"**.

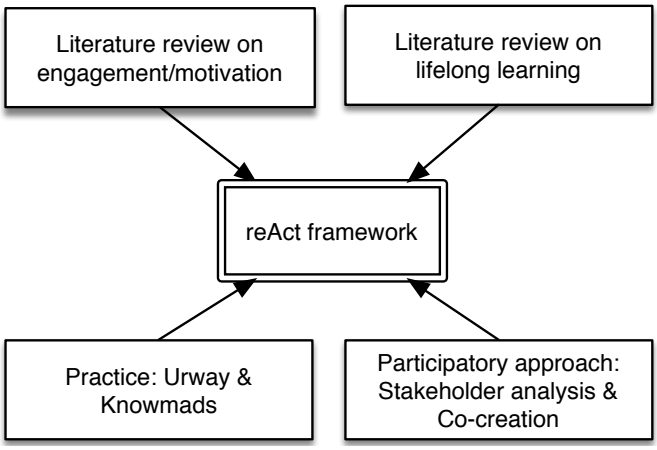

Figure 5 – Creating the reAct Framework

3.1 Formal Education, Learning, and Engagement

3.1.1 Society and Education: What At-risk Youth Should Learn

The idea of schooling as the main instrument for economic progress, rather than personal development or the advancement of democracy, is the reason that education is compulsive in most countries in the world (Illeris, 2007). School represents society as it teaches what society chooses to remember, what is considered important today, and what is believed to be relevant tomorrow. The objective of schools is to *"shape the minds and mentalities of young people and encourage them to understand and act in society in particular approved ways"* (Williamson, 2013, p. 3). Or, more cynically; *"schools are the advertising agency which makes you believe you need society as it is"* (Illich, 1971, p. 48). Bourdieu

repeats this same notion, and describes the formal education system as 'symbolic violence' that ensures that society's dominance and power structures are accepted and internalized by the individual (Bourdieu, 1998). He also argues how school's qualification and sorting functions maintain and legitimize exactly the phenomenon that it is supposed to reduce, which is social inequality.

Schools carry a normative view of the future, in the sense that policy, shaped by societal events, largely determines its design, organization, curricula, and culture. For example, in the aftermath of the successful launch of Sputnik in 1957 by the USSR, schools in the USA experienced increased pressure to raise academic standards, and to focus more on mathematics, science and foreign language courses (E. Smith, 2005). Curricula change, albeit usually at slow pace, to accommodate to changing demands in society. Centralized governments feel responsible for educating its citizens, and consequently the educational system has developed into an institutional monopoly organized by means of test-based accountability measures (Hout & Elliott, 2011; Illich, 1971). Curriculum design, even today, relies on assumptions that characterize the twentieth-century industrial era of mass production, centralization, and organized hierarchy. Essentially, it assumes a predictable and controllable world that progresses slowly.

The advent of the Internet further challenged these assumptions. Williamson (2013), in an examination of how ideas about learning in an emergent open educational commons are linked to questions about the curriculum, sketches an emergent 'curriculum ideal' of networked connections, complex systems, and open education:

"The current era is characterized by the plasticity of information, the perpetual beta, an open, decentralized approach to information, and open-source politics, all powered by the Internet's centrifugal forces. In such a smart decentralized world of networks, it is argued that the dynamic and the mobile are challenging centralized bureaucracy, dialogue and cooperation are preferred to hierarchical authority and order, flexibility seems more important than routine, and a counter-culture of the Internet geek has taken over for the dark-suited manager of the big firm. […] Network-based technologies introduce new possibilities for interaction, common dynamics, and participation into everyday life and learning", which *"is increasingly decentered and dispersed in time and space, horizontally structured, networked and connective, and convergent across many different media. In a networked world, learning can take place online as well as in high schools, museums, after school programs, homes, business, broadcast media, public libraries, and community settings. The emphasis is increasingly on dispersed, decentralized, and virtual learning taking place fluidly across lifetimes, social sectors, and media, with the Internet itself imagined as a learning institution. Such arguments are set against schools understood as innately conservative institutions that continue to rely on structured hierarchical relationships, a static print culture, and*

old-style transmission and broadcast pedagogies that are at odds with the networked era of interactivity and hypertextuality." (Williamson, 2013, p. 32)

Tuomi (2007) further addresses this complex relation between society, digital technologies, and the education system, by referring to Luhmann's 'social categories'. Society invents social categories to simplify the world and manage its complexity (Luhmann (1995), in: Tuomi, 2007). Education, traditionally, creates these categories, but the *"historically unparalleled pace of developments in information processing technologies has during the last five decades guaranteed that complexity can increase faster than predictability"* (ibid: 2007, p. 238). This makes it more difficult to establish professional and vocational categories that appropriately address future demands, with the risk of delivering students who are ill-prepared to function effectively in the modern world, often referred to as an information society (ibid).

In contrast, many of today's students still face the traditional instructivist, teacher-centric pedagogy, characterized by *'strict rules, discipline, and obedience for norms and orders laid out by society'* required to serve the 'military-industrial-administrative machines' that governed 19th and 20th century empires (Mitra, 2014, p. 549). Current approaches in the classroom are predominantly based on a world-view in which information and knowledge are scarce resources. In such a world, the economics of education are fairly simple: Learners create a demand for knowledge, which could only be 'delivered' by a few experts through lectures. Nowadays, no one can deny the abundance of information available online[6] and through other sources; the traditional 'pedagogy of scarcity' should therefore be reconsidered in the context of the complexity of a networked, information society (Weller, 2011). Rather than a narrow focus on knowledge and vocational skills, this new societal context demands approaches that encourage learners to make decisions, confront the dilemmas and uncertainties of life and to take risks in order to deal with changes in their environment (Barnett, 2002).

Since it becomes more and more difficult to predict the future, education should prepare students to flexibly adapt to changes in a complex society. Such calls are not new. Decades ago, Illich argued that, in order to counter further increases in the institutionalization of values, we must investigate conditions that do precisely the opposite, and that *"we need research on the possible use of technology to create*

[6] It should be noted that according to the World Bank, in 2015 still less than half of the world's population is connected to the Internet. Source: http://data.worldbank.org/indicator/IT.NET.USER.P2

institutions which serve personal, creative, and autonomous interaction and the emergence of values which cannot be substantially controlled by technocrats" (Illich, 1971, p. 3).

The complexity of this interplay between information, technology, society, and education is captured in the illustration below, in Figure 6. It shows how external 'forces', such as information increase, technology, and globalization change societal and economic conditions that frame education. Education, in turn, delivers alumni, dropouts as well as new ideas, knowledge, and cultural values that shape, create, or reinforce these conditions. This happens in a highly dynamic context of constant change, with new opportunities and challenges. The illustration shows how education 'reacts' on society, and, with a delay, tries to influence it. The quality of education depends on the quality of the output, in other words, whether or not it has a positive effect on social and economic conditions. Education brings forth people who create the conditions in which education is framed, as described by Illich: *"People who submit to the standard of others for the measure of their own personal growth soon apply the same standard to themselves. They no longer have to be put in their place but put themselves into their assigned slots, squeeze themselves into the niche which they have been taught to seek, and in the very process, put their fellows into their places, too, until everybody and everything fits"* (Illich, 1971, p. 40).

The complex society-education relationship can be a virtuous cycle, if designed well, or a vicious cycle that kills creativity and innovation and threatens democracy, well-being, and economic progress. Schools have been successful in transmitting 'a common core' set of knowledge and cultural beliefs, but have generally failed in preparing students for life, in particular with regard to critical and creative thinking for problem solving and decision-making, resulting in a system that is one of the prima sources of stability, or pattern maintenance, in society: *"Public education's overwhelming success as a pattern maintenance institution is at the heart of its failure to match changing societal expectations"* (Betts, 1992). One of the major instruments that sustain public education as a 'pattern maintenance institution' is test-based accountability, which is discussed in the next section.

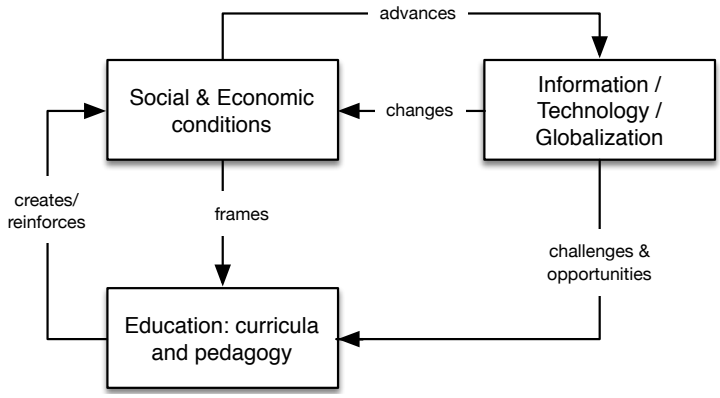

Figure 6 – The dominant hierarchical educational system

3.1.2 Addressing At-Risk Youth through Accountability, an example from the USA

One of the primary instruments of quality assurance in education is through 'test-based accountability' systems, described as *"potentially powerful but blunt tools to influence what happens in local schools and classrooms"* (Hout & Elliott, 2011). It constitutes *the* essential policy instrument to sustain the hierarchical model of education, and has been for more than 50 years. There are different interpretations of accountability and different accountability policy models, but the model that dominates today is performance driven, test driven, measurable, and statistical in nature (Lee, 2008). Education is framed and conditioned through positive and negative incentives integrated in policies that hold educators and students accountable for meeting specific educational targets and measurable goals. Test-based accountability depends on a highly standardized (national) curriculum, and the clear classification of topics, desired outcomes, and the measurability of outcomes for all public schools. Although goals are often the same for similar schools, less restrictions apply to the means on how to reach those goals, but one can imagine that strict and specific requirements on outcomes influence not just what is taught, but also require a particular pedagogical approach to achieve these outcomes.

To understand the implications and risks associated with the hierarchical model, and the policies that maintain it, we investigate the 'No Child Left Behind' Act in the USA (*No Child Left Behind Act of 2001*, 2002). NCLB is chosen here as an example of similar, top-down test-based accountability measures and policies across the world, including the EU. It is a highly-debated and well-researched policy measure, and its relatively recent introduction, only 15 years ago, make it an appropriate case to highlight the potential risks and flaws of similar policies. In the following sections, we make the argument that test-based accountability measures often result in strategic behavior and incentivizes a narrow, rather than holistic, approach to learning, leading to disengagement and other undesired effects.

In his campaign for US presidency, George W. Bush promised to 'close the achievement gap' in education, by introducing the NCLB as a means to accomplish high academic standards and to promote equity, justice, and social citizenship among all youth. It particularly targeted students at risk of dropping out, which were predominantly children and young adults from ethnic minority groups and low-SES areas. The then President Bush exclaimed, when signing the bill, that *"As of this hour, America's schools will be on a new path of reform, and a new path of results"* (Rudalevige, 2003).

Few would, or did, oppose the Act's laudable objectives, or even the general idea of holding schools accountable. However, many condemned the means by which to achieve these objectives, which entailed the introduction of strict national standards on educational accomplishments for schools, and punishing or rewarding schools on

their performance (including Crawford, 2004; Elmore, 2003; Kohn, 2000; Rudalevige, 2003; J. E. Ryan, 2004). Early critics warned that the market-based paradigm, on which NCLB was based, would be harmful for society, diversity and social equality. Moreover, the targets were deemed unfeasible and impractical, and particularly affect disadvantaged youth.

Giroux and Schmidt (2004) described how strict test-based accountability practices emerge from a market-oriented paradigm, encouraging a competitive individualism that subjects students to a competitive ethic that allows them to distinguish themselves from others, and encourages teachers to outperform their peers to get their rewards:

"What becomes increasingly clear, however, is that schools are seen less as a public benefit than as a private good, teachers are largely deskilled, knowledge is stripped of its critical functions and matters of equity and funding are given a low priority. Accordingly, they are concerned less with the demands of equity, justice and social citizenship than with the imperatives of the marketplace and the needs of the individual consumer. Whatever conception of agency, citizenship, and democracy does exist becomes synonymous with market-based notions of choice, high-stakes testing hyper-competitiveness and individual student mobility. Achievement is structured through a narrow notion of individual success rather than as an appeal to critical learning linked to expanding civic education and investing democratic public life with vibrancy. Turning schools into test-prep centers becomes the ultimate measure of quality teaching with an emphasis on annual testing, parental choice and drill and skill teaching." (Giroux & Schmidt, 2004, pp. 213–214).

NCLB was also criticized for being ineffective and unrealistic (E. Smith, 2005). Guisbond and Neill argued that the Act would be ineffective at most, and probably counter-productive, by challenging two basic assumptions that underpinned the policy (Guisbond & Neill, 2004); i) that standardized test scores are a valid representation of learning, and ii) poor student performance was the result of poor teaching, and that by punishing poorly performing students and teachers, performance would go up ultimately. Critique concerning the first assumption came down to the idea that NCLB would encourage educators to focus on the tests, which would undermine efforts to provide high-quality education to all students, and would move away focus on less objectively measurable activities that contribute to more complex, but important educational goals, such as responsible citizenship and economic self-sufficiency. NCLB further established the idea that *"education consists of pouring knowledge into empty receptacles"*, rather than helping students become proficient learners (Kohn, 2004, p. 575). The focus on testing would also be at the cost of capacity building (Elmore, 2003), disempower teachers and reduce diversity of instructional practices and opportunities for genuine learning (Giroux & Schmidt, 2004).

The second assumption was that unsatisfactory student performance was the result of poor teaching. By introducing threats and sanctions, schools and their teachers are inclined to focus narrowly on boosting test scores, which fails to address underlying problems such as family poverty and inadequate school funding. In NCLB, a link is established between standardized testing and sanctions through the 'adequate yearly progress' (AYP) formula, which was deemed unrealistic as well as too rigid and not grounded in any proven theory of school improvement (Guisbond & Neill, 2004). As suggested by Elmore, it would likely exacerbate the problem it was trying to fix by destroying capacity and expertise: *"The AYP requirement, a completely arbitrary mathematical function grounded in no defensible knowledge or theory of school improvement, could, and probably will, result in penalizing and closing schools that are actually experts in school improvement"* (Elmore, 2003, p. 7).

Another relevant objection, in the context of our research, was that test-based accountability, by identifying those individuals (and schools) who fail the yearly test, further stigmatize and discourage groups at risk (Guisbond & Neill, 2004). It would also more strongly affect those with poor language skills (Crawford, 2004). Finally, test-based accountability actually incentivizes to get rid of those who contribute to lower achievement:

"Coupled with a pervasive culture of punishment, enforced through existing zero tolerance policies, high stakes testing provides a further rationale for getting rid of students with disabilities and those poor white, black and brown students who pose a threat to schools that model their success almost exclusively on measured forms of achievement" (Giroux & Schmidt, 2004, p. 215).

Kohn (2004) called for resistance after pointing to pragmatic as well as fundamental flaws and risks associated with the new policy:

"Ultimately, we must decide whether we will obediently play our assigned role in helping to punish children and teachers. Every in-service session, every article, every memo from the central office that offers what amounts to an instruction manual for capitulation slides us further in the wrong direction until finally we become a nation at risk of abandoning public education altogether. Rather than scrambling to comply with its provisions, our obligation is to figure out how best to resist" (Kohn, 2004, p. 576)

The controversy and opposition to NCLB was followed by a significant number of studies that evaluated outcomes and implications. It became clear that little to no positive effects were measured during the 14 year life-span the policy was in place, and that by no means it helped reduce the academic gap (McCluskey, 2015). One of the most important outcomes, across various studies, was that high-stakes testing (i.e. exit exams) did not improve conditions for disadvantaged and low-achieving students, but actually increased the gap it was intended to close (Tyler & Lofstrom, 2009). A large study of 271,000 students enrolled in high-poverty high schools in Texas (USA), demonstrated how test-based accountability measures contained

perverse incentives that run counter to the original objectives of the policy. Rather than leading to equitable educational possibilities for all youth, NCLB was shown to put the most vulnerable youth (i.e. poor students, poor language proficiency, ethnic minorities) at risk of being pushed out of their schools, such that the schools would comply with formal standards (McNeil, Coppola, Radigan, & Heilig, 2008). Ethnic profiling of test-scores, one of the elements in the NCLB policy, even contributed to further stigmatization of under-represented groups resulting in a higher number of dropouts among African-American and Latino kids, *and* they dropped out at an earlier age (Walden, 2008). Most schools with a relatively large non-White student population from low-income families were low-performing and under-funded; rather than improving opportunities for at-risk youth, these schools were more likely to be punished, resulting in even less funding, making it practically impossible to improve learning conditions (Darling-Hammond, 2007).

Poor grades, rather than encouraging to do better next time, may induce a process of disengagement among under-performing students belonging to specific groups, because students may fear to confirm an existing negative stereotype about 'their group'(McMillian, 2003). As a way to protect self-esteem, students no longer identify themselves with academic achievement. Test-based accountability, especially when group differences in test scores are emphasized, contributes to unconscious cognitive interference for students (Steele & Aronson, 1995). High-stakes tests puts disadvantaged students under high levels of pressure, and implicitly labels underperforming students as liabilities, which undermines their sense of belonging, furthers stigmatization, and negatively effects school engagement and performance (Aronson, 2004). Performance on standardized tests is closely linked with language proficiency, which implies that these tests are biased in favor of those with proficient language skills (often more academically oriented families), and disadvantages those with limited proficiency (migrants and kids with illiterate or less literate parents) (Crawford, 2004). Not just under-performing kids were experiencing negative effects of the strict, standards-based accountability. High-performing kids were also found to be in a disadvantage: as schools were implicitly encouraged to get as many students above the established minimum grade threshold, less attention was paid to those who performed well above average (Payne-Tsoupros, 2010).

Labeling schools as 'under-performing' further stratified teaching quality across schools: as under-performing schools found it more challenging to attract or retain high-quality teachers, it happened that struggling students, often with limited learning support at home, were taught by less experienced teachers with limited subject- and pedagogical knowledge (Darling-Hammond, 2007). Teachers, many with yearly contracts, were assessed based on their students' test results, which many concerned unfair and based on factors out of their control (Grissom, Nicholson-Crotty, & Harrington, 2014). NCLB encouraged a process of narrowing of

the curriculum, and undermined teachers' creativity and autonomy, and hindered possibilities to foster meaningful relationships with students (CEP, 2005; Crocco & Costigan, 2007). In a comprehensive review on the impact of accountability policies on teachers' workplace relations, Mausethagen (2013) concluded that more testing leads to less attention to caring and relational aspects, which seems paradoxical, since numerous studies point to the essential role of social relationships in the learning process. In addition, he found a diminished collegiality in educational environments controlled by test-based accountability. Before the introduction of NCLB, Stecher and Barron (2001) demonstrated the effects of state-wide test-based accountability on classroom behavior and teaching strategies. They compared the behavior of teachers who were teaching subjects that were 'officially tested' in a particular year with i) other teachers in that year, and ii) the behavior and strategies of that teacher in years when their subject was not 'officially tested'. They found that, consistent with the incentives promoted by the test-based accountability system, teachers spent more time teaching topics that were part of the official test, which seems positive. However, it also significantly reduced time and effort invested in other topics of the curriculum. In addition, the focus was much more on proximal goals to meet the official standards rather than distant goals the policy was intended to promote. In fact, teachers merely focused on reported measures than the broader core constructs that were being measured (e.g., mathematics and writing), and *"emphasized the specific performance methods used in the assessments rather than the range of performances that characterize the underlying domain"* (2001, p. 278). NCLB and the test-driven instructional culture it promoted turned many schools into 'test-prep' factories and created poor teaching conditions, resulting in higher disengagement, especially among disadvantaged youth. Faced with challenging, and sometimes unachievable academic goals, confronted with their own failure to succeed in a competitive environment, they became disillusioned and lost respect for school and for teachers, leading to negative behaviors in class, which contributed to the already reduced teacher morale (Byrd-Blake et al., 2010).

3.1.3 Placing NCLB in a European Context

In Europe, educational systems have seen a significant shift towards decentralization and growing school autonomy, combined with increased focus on accountability (EC, 2008). Teachers were assigned new responsibilities to account for the increasingly diverse student population as well as students with special needs. Increasingly influential on educational policy reform have been international student assessments, such as PISA (*Programme For International Student Assessment*), which compare educational outcomes globally (Grek, 2009). In practice, however, decentralization efforts have primarily focused on administrative, human resource management and financial autonomy, but these rarely resulted in more teacher autonomy. Paradoxically, transferring tasks and responsibilities to schools reduced the capacity of individual teachers to take their own classroom

decisions, and obliging teachers to cooperate with content, timetable, and assessment in ways that inhibit individual classroom independence (EC, 2008). Top-level authorities still largely determine conceptual frameworks that govern the educational system, which means that in virtually all EU countries, compulsory curricula remain restrictive and an increased emphasis on external evaluation of teachers, rather than internal assessment procedures.

Test-based accountability and transparency (making results publicly available) are becoming increasingly common policy instruments to encourage competition between schools, foster educational innovation and improve educational quality (Fuller, 2008; Hout & Elliott, 2011; Sahlberg, 2010). However, the evidence is controversial with regard to whether or not intended objectives of educational quality are met through policies that evaluate performance using standardized knowledge tests. An analysis of the effects of PISA on educational policies concludes that numbers are frequently used as an impetus to drive through ideologically informed policies: *"In this era of accountability-by-numbers, the elevated status accorded to large-scale external assessments such as PISA results is symptomatic of a trend towards data-driven policy initiatives in education, and the need for regular sources of outcome data to constantly feed narrow indicators of accountability"* (Froese-Germain, 2010). Decentralization and efforts to move responsibilities from central governments to schools should therefore seen as an attempt to foster competition and to align educational policies with a neoliberal mindset and 'New Public Management'[7], rather than as being informed by pedagogical imperatives.

Making schools accountable through standardized tests and other data-driven school improvement approaches seem to negatively affect students' conceptual learning, creativity and innovation, and encourage all stakeholders to game the system and focus on the short-term to create an appearance of improvement that keeps high-level administrators and politicians happy (Froese-Germain, 2010). The idea of data-driven improvement is, of course, not wrong. Indeed, many fast-growing and successful organizations employ rigorous data-driven approaches to improve their services or products. However, it depends on the interpretation and ethical use of the data, and understanding the implications of attaching consequences to results.

[7] New Public Management (NPM) is a management/development system that is utilized in companies, agencies and countries in their entirety and assumes that ideas used in the private sector must be successful in the public sector. It regards citizens as customers and administrators as 'public managers', who have more autonomy in the fulfillment of their duties, making accountability increasingly important. Source: https://en.wikipedia.org/wiki/New_public_management

In an increasingly complex and data-driven society, just and ethical use and interpretation of data becomes more important. Educators face the significant challenge of differentiating assessment–for–learning from assessment–for–accountability (Macfadyen, Dawson, Pardo, & Gašević, 2014). Fundamentally, the process of quantification is a process of reducing or transforming reality to be better comprehensible and comparable. Often, numbers miss the point and distort the learning and teaching process, thereby reducing the relevance and weight of teachers' moral judgment and professional responsibility (Hargreaves & Shirley, 2009). In most EU countries, funding is tied to educational performance on standardized tests, resulting in the same kind of strategic behavior and undesired system dynamics that have been described above, and hence, higher levels of disengagement and more narrowly focused curricula and pedagogical approaches. Decentralization has, rather than increasing classroom autonomy, induced teachers into a more competitive professional environment that is more demanding and leaves less time for teaching (EC, 2008).

3.1.4 The Limits and Flaws of Test-based Accountability

The discussion about test-based accountability, and in particular the undesired and perverse behavior it can promote, is fundamental to our understanding of disengagement. Without the broader picture about what drives contemporary educational practice, it's difficult to devise and implement sustainable practices that effectively engage youngsters. Before we start constructing the reAct framework, it helps to summarize the fundamental flaws and potential negative effects reported in the previous sections.

Test-based accountability, as a way to improve educational opportunities for all, is based on the following two assumptions. First, it incorrectly assumes that student performance on standardized tests results directly from the efforts put forth by teachers. Hence, by attaching consequences performance in tests, teachers will be motivated to work harder, resulting in better performance, more educational innovation and eventually reduce achievement gaps. We have shown that these incentive schemes indeed 'motivate' teachers, but in unanticipated and often counter-productive ways. Hence, test-based accountability does work as an instrument to facilitate change, but it may not be the desired change. The second assumption is that tests are adequate measures of essential academic goals, and that performance on tests accurately represents students' long-term proficiency in relation to those goals. Possibilities of 'gaming the system' are often overlooked; rather, proponents of text-based accountability belief that these schemes are the right incentive for schools to adopt a long-term, consistent, and comprehensive strategy that incorporates the broader content domains (e.g. critical thinking, creativity) these tests are intended to represent.

Although the concept of test-based accountability is easily understood and appears common sense, the enacted policies produce undesirable results. Most importantly, there are serious doubts about its effectiveness, as there is little evidence to support the claim that test-based accountability leads to higher student achievement, and frequently leads to even higher dropout rates and fewer graduated students (Volante, 2007). Moreover, it seems to be especially detrimental to struggling students and those belonging to minority groups, who experience higher levels of anxiety in response to standardized testing (Dorvil, 2011; McMillian, 2003; Steele & Aronson, 1995). Teachers under strict standards-based accountability schemes are less able to connect to students and establish meaningful relations with them, which severely affects their teaching potential (Mausethagen, 2013). Teachers are encouraged to focus on a limited set of skills/outcomes only, which often results in a less comprehensive curriculum as well as a less diverse pedagogy aimed at repeating and recalling facts rather than deep understanding (Stecher & Barron, 2001). Similar to students, high-stakes tests increase stress and reduce morale among teachers, and the public availability of test scores drives the most talented teachers away from schools with larger populations of struggling students (Hargreaves & Shirley, 2009).

Educational systems are value systems. Even in educational systems that are purely focused on delivering able workforce, students learn more than just the skills required for a particular trade. They internalize the dynamics, rules, and values of the educational system, which in turn shape our beliefs about society (Sterling, 2003). When, in such a system, learning is equaled with a competitive process for high grades and diplomas, the result can be a narrow-minded vision of what society is, or should be. Those who succeed in such a system will apply the same standards to others, maintaining the dynamics of the system that shaped them. Those who fail to perform according to these standards are seen as 'patients' who need treatment, or lazy individuals responsible for their own lack of success. A normal 'remedy' is then to offer these youngsters 'a second chance' to succeed, and to increase pressure as well as the level of support, such that they will fit in, and conform to the established educational norms and requirements. Such a narrow definition of failure or success also overlooks the fact that many who succeed, still fail to develop the sense of responsibility, attitude, and behavior that is truly necessary in our complex and dynamic information society. To ensure that we appropriately educate youth, the fundamental principles that shape the dynamics of 'modern' education and society need to be questioned. We therefore agree with Giroux and Schmidt, who warrant a reflection on values that underpin pedagogical practice:

"Refusing to analyze the values that frame the manner in which authority is constructed and leadership defined as a critical political and democratic pedagogical practice, educational reforms result in celebrating the rules of management, regulation

and control at the expense of substantive democracy, critical citizenship and basic human rights." (Giroux & Schmidt, 2004, p. 221)

ReAct promotes the idea of fewer control mechanisms, but trusting school managers, teachers, and students to self-adjust to local and personal needs. Through the implementation of an innovative approach in relatively traditional non-formal and formal educational contexts, conditions and factors that influence the effect of the approach can be identified and which inform future designs and iterations of innovative pedagogy in a decentralized, self-organizing educational paradigm based on trust, as depicted in the illustration below (as opposed to the one-directional and hierarchical model in Figure 6).

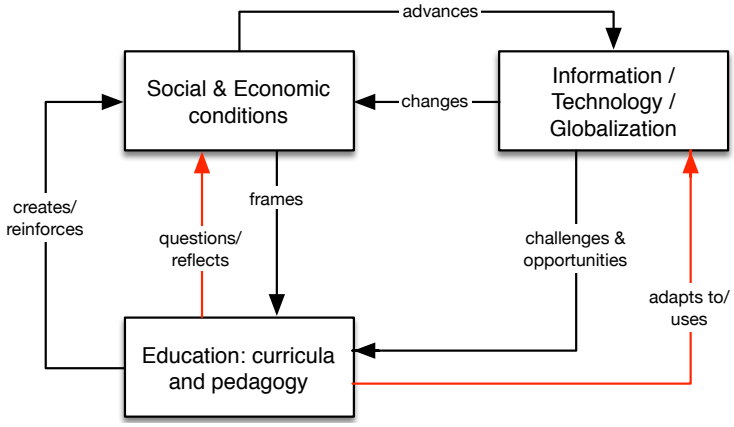

Figure 7 - A participatory educational system model

3.1.5 Transition to a Learning Environment based on Trust

Fundamental, systemic change processes require shared ownership between all key players (Reigeluth, 1993). From both a practical perspective and belief (as explained in the previous section), the reAct project was not aimed at designing and implementing a single intervention in a top-down manner. Rather, to account for the different contexts, and to promote a process of transition, a participatory approach was adopted that involved local stakeholders, including partners, managers, teachers, and students, in the process of exploring and integrating the reAct approach. Indeed, we agree with Betts, who argued that *"the old system is no longer adequate to the task, [..] and that no amount of fine-tuning of the old system will produce significant improvement"* (Betts, 1992, p. 40).

At the same time, we acknowledge that the standardized test-based accountability policies are well established within educational regulatory frameworks and are unlikely to disappear anytime soon. We concluded, therefore, that the objective for reAct was to develop an approach and supporting framework that can mitigate between these two seemingly conflicting educational paradigms, as illustrated in Figure 8 below.

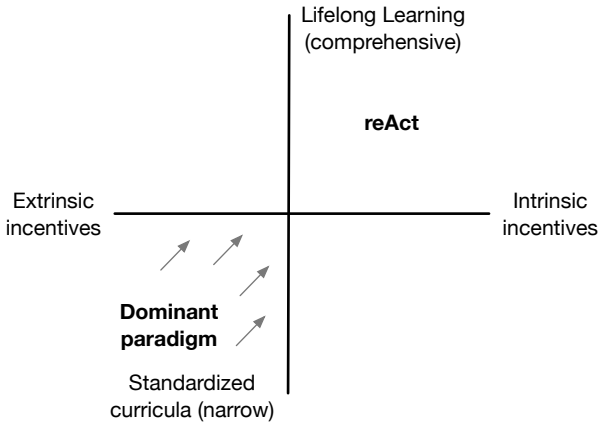

Figure 8 – Traditional paradigm and the reAct approach

The reAct project can be understood as a pilot project to test a new paradigm in the context of an existing teaching practice based on the traditional paradigm. The partners and participating institutions agreed to (temporarily) replace the existing paradigm and teaching practice with the reAct approach and the paradigm it represents. The arrows represent the desired 'transition process' the reAct framework intended to facilitate. An important part of the transition process was to involve the actual stakeholders (managers, teachers, partners, students) in the reAct design process as well as implementation of the pilots. More about this was described in the previous chapter (section 2.3). Another component was the analysis of two exemplary initiatives, UrWay and Knowmads, which are described in section 3.4.

3.2 Learning Process and Content

Based on the description of the dynamics of formal education, and how these affect marginalized at-risk youth, we proposed trust as a central principle of the reAct approach. In this section, we first provide a theoretical frame for conceptualizing the learning process of reAct. We then describe learning in the context of a changing society, by discussing lifelong learning and various 21st century skills frameworks. We conclude with a section on the role of technology, and its role within the reAct project.

3.2.1 Framing the Learning Process

In order to establish and choose a set of appropriate principles, we used Illeris' learning triangle: a comprehensive theoretical framework that captures interdependent and complementary learning theories. The framework connects three interdependent realms of learning theories addressing motivation, content, and a social dimension. Illeris (2007) describes learning as a process that comprises of an internal, mental process and an external, interactive process of the learner with the environment.

The internal process, or the acquisition process, consists of a content dimension (that what is being learned.) as well as a motivation or incentive dimension, which drives the individual into and during the acquisition process. Content is defined deliberately broad; in addition to knowledge and skills, it also includes personal qualities and dispositions such as independence, self-confidence, responsibility, ability to cooperate, and flexibility. Following Illeris, we employed the broad definition of learning as a psychological process of elaboration and acquisition in which new impulses are connected with the results of prior learning.

The interactive process refers to the concept of situated learning, which means that learning takes place in a certain context that influences both the learning process and its results. *"Knowing is inherent in the growth and transformation of identities and it is located in relations among practitioners, their practice, the artifacts of that practice, and the social organization"* (Lave & Wenger, 1991, p. 122). Although Lave and Wenger mostly refer to professional or organizational contexts, the concept of situated learning is broader and has a dual nature: it is the social, direct or immediate learning context (i.e. school, family or workplace) as well as the societal context (with norms, rules, institutions, culture) in which learning takes place (Illeris, 2007). There are several distinct 'contexts' in which learning takes place, sometimes strictly divided, but often (inter-)related and with permeable boundaries. These contexts, or 'learning spaces' can be described as (i) everyday and informal learning, (ii) the educational or school space, (iii) learning in working life, (iv) online learning, (v) leisure time and grassroots activity (ibid). Often, you will also find a combination of working life and educational space, called alternating education and aimed at promoting transversal learning, including learning to learn, social and civic competence, initiative taking and entrepreneurship, and cultural awareness and expression (EC, 2012a). Each of these spaces has distinct characteristics that relate to one or another kind of learning. For example, learning in the everyday and informal space is something that happens all the time and is embedded within daily life activities. Also, it is often personal and without explicit pedagogy or curriculum (Greenfield & Lave, 1982). The other spaces are more organized and structured, most significantly the educational space.

In summary, all learning always includes three dimensions – the cognitive dimension of knowledge and skills, the emotional dimension of feelings and motivation and the social dimension of communication and cooperation – all of which are embedded in a societally situated context (Illeris, 2003). The 'How' in our main research question therefore refers as much to the content (which skills, attitudes), as the incentives component, and the social and societal context, with a particular interest in the instrumental role of (web-)technologies. The reAct approach must be comprehensive, rather than just focused on one of these aspects. Figure 9 below illustrates these three dimensions, including the specific interests and objectives of the reAct project.

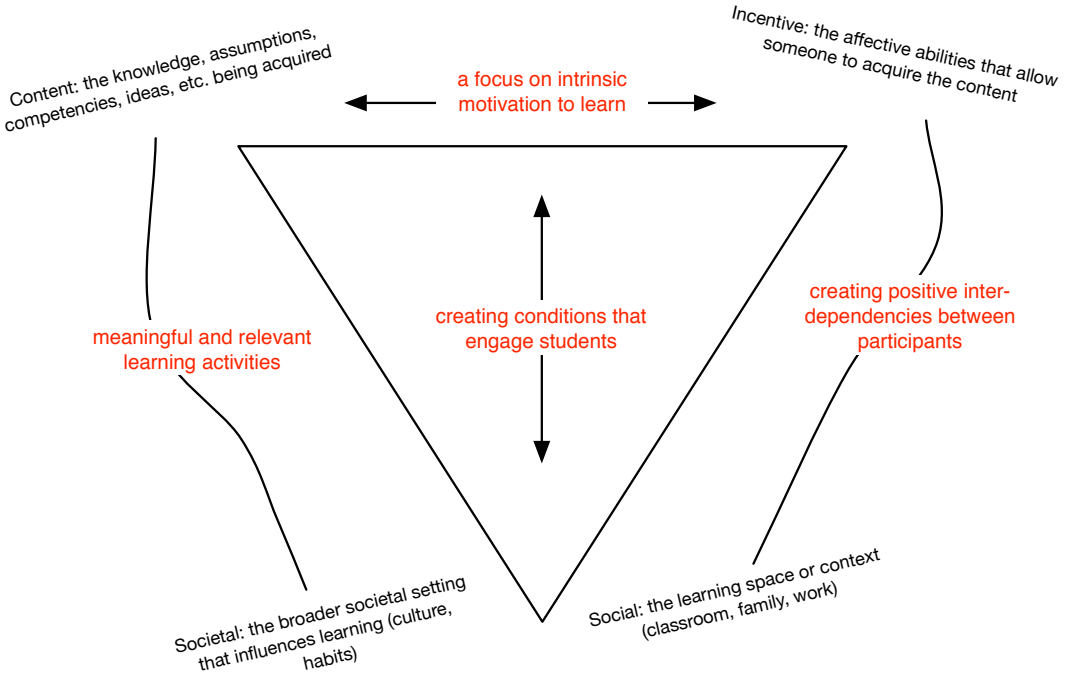

Figure 9 - Placing reAct within Illeris Comprehensive Theory of Learning

3.2.2 Lifelong Learning in an Information Society

The next step in developing the set of pedagogical design principles is an exploration of the content dimension. Here we focus on the concept of lifelong learning and 21st century skills, which are related with important reAct goals, such as employability and ability to be(come) self-sufficient in a complex and changing society.

As discussed in section 3.1.1, the process of learning has always been intricately linked with societal needs and demands in a particular moment in time. In primitive societies, almost all learning was integrated into everyday life, with hardly distinction between leisure time, work and learning. With the industrial revolution, rise of capitalism, and the Enlightenment, societal work became wage labor, which had a separate place in society and required specialized qualifications with regard to skills and knowledge. The needs for skilled labor formed the initial impetus for compulsory education, leading to a more diverse range of disciplines and schools to accommodate for an increasingly complex world (and industry). The industrial revolution laid out the foundations for the current 'knowledge society', which places learning at the core of economic growth and global competition (Illeris, 2003). The knowledge society refers to economic systems where ideas or knowledge function as commodities, as opposed to the earlier-mentioned 'information society' metaphor that is more concerned with the implications of the abundance of information on economy, education, and society at large (Voogt & Roblin, 2010). Benkler describes how in a 'networked information society' new opportunities for production arise that are not just based on traditional market-based incentives:

"In the networked information economy, the physical capital required for production is broadly distributed throughout society. Personal computers and network connections are ubiquitous. This does not mean that they cannot be used for markets, or that individuals cease to seek market opportunities. It does mean, however, that whenever someone, somewhere, among the billion connected human beings, and ultimately among all those who will be connected, wants to make something that requires human creativity, a computer, and a network connection, he or she can do so—alone, or in cooperation with others. He or she already has the capital capacity necessary to do so; if not alone, then at least in cooperation with other individuals acting for complementary reasons. The result is that a good deal more that human beings value can now be done by individuals, who interact with each other socially, as human beings and as social beings, rather than as market actors through the price system." (Benkler, 2006, p. 6)

Manuel Castells characterizes the network(ed) society by a shift from groups and hierarchies to networks as the dominant social and organizational model that maintain more flexible arrangements of human affairs through the use of information technologies (M. Castells & Himanen, 2004). Praising the Finnish education model, he states that education policy is central to everything, but not *"any kind of education or any kind of policy: education based on the model of learning to learn along the life cycle, and geared towards stimulating creativity and innovation in the ways and goals of applying this learning capacity in all domains of professional and social life."* (Manuel Castells, 2005, p. 18)

Especially in an information society, people are expected to have a number of essential skills, such as i) Knowledge construction; ii) Adaptability; iii) Finding, organizing and retrieving information; iv) Information management; v) Critical thinking; and vi) Team work (Voogt & Roblin, 2010). As people change their professions more frequently, and, due to demographic changes, have a longer working life, there is a growing need for people who are able to accommodate to changing demands and job opportunities, and who can pro-actively design their career (T. Malone & Laubacher, 1998; Redecker et al., 2011). Professional careers become more flexible and the competence that enables one to develop oneself and seize relevant formal and informal learning opportunities fundamentally drives lifelong learning:

Global competition for skills, technological advances, the impact of the Internet and new media on employment, learning and private lives, the growing diversity of our societies – all are forces, which are reshaping our education systems and changing the content of and approaches to teaching and learning. To face the current crisis, increase productivity and encourage growth, education systems have a crucial role in building the right 21st century skills and competences. (EC, 2012a)

The European Commission proposes the following four complementary objectives with regards to 'lifelong learning': i) personal fulfillment; ii) active citizenship; iii) social inclusion; and iv) employability/adaptability. These objectives are reflected in the definition they proposed, which conceptualizes lifelong learning as;

"all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective". (EC, 2001, p. 9)

The definition addresses the relation between lifelong learning and 21st century skills. 21st century skills or competences constitute the individual and collective *learning capacity* to learn, adapt, innovate, and contribute to the values considered pivotal for a democratic and sustainable society. These values are normative and based on a desired future state of society, and to change to this desired state, lifelong learning programs and policies are developed. However, as we've seen, the existing social and societal fabric creates the conditions that allow individuals to make use of these opportunities. The illustration below aims to capture these interrelated elements.

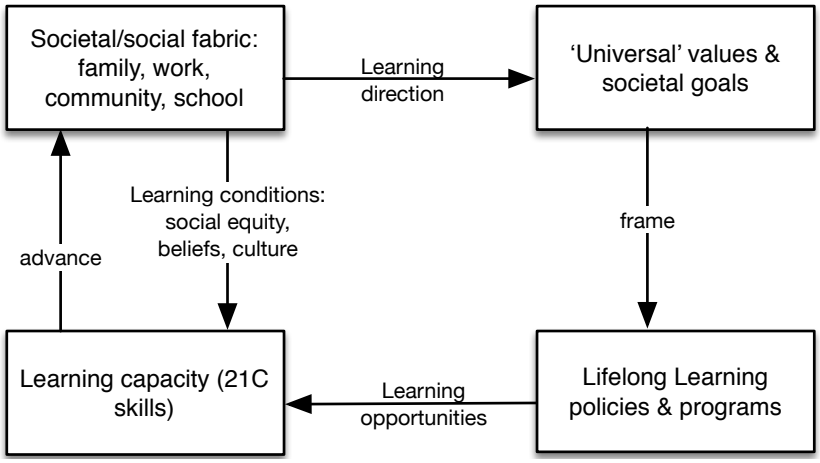

Figure 10 - Lifelong Learning and 21st century skills - learning direction, opportunities, and conditions

Lifelong learning policies offer a frame for *defining the objectives of formal and non-formal education*, the *structure of provision*, the *content, quality and relevance*, for *resource provision and management*, and finally for *roles and responsibilities* of all stakeholders and participants (OECD, 2004). Relevant learning opportunities should be provided in ways that engage individuals and improve their capacity to learn in a self-organized manner. The development of curricula, content, programs, and activities should be viewed from these three perspectives (relevance, engagement, learning to learn). In addition, educational opportunities should reflect the different, interrelated learning settings, such as the work-life, leisure time, and home setting, and encompass formal, informal, and non-formal learning. The

structure of learning content, activities, curricula, and programs should be in a way that creates the right linkages between these settings.

Traditionally, lifelong learning policies address formal learning arrangements at young age, which are organized within institutional frameworks, and have a strong emphasis on curricula and content. Gradually, learning moves into the direction of more self-organized, informal and workplace learning, strongly facilitated by ICTs (Veen, van Staalduinen, & Hennis, 2010). Lifelong learning is a complex phenomenon that addresses the importance of connecting different learning contexts and a variety of learning skills and attitudes with the objective of building a competitive, sustainable, democratic, and inclusive society. Key competences that have been proposed in relation to lifelong learning policies are included in the table below[8]:

Table 5 - Key competences as proposed by the European Commission (EC, 2012a; Gordon et al., 2009)

Key competence	Explanation
Communication in the mother tongue	Communication in the mother tongue is the expression and interpretation of concepts, thoughts, feelings, facts and opinions in both oral and written form, and to interact linguistically in an appropriate and creative way.
Communication in foreign languages	Communication in foreign languages broadly shares the dimensions of communication in the mother tongue but particularly emphasizes skills such as mediation and intercultural understanding.
Mathematical competence and basic competences in science and technology	Mathematical competence is developing and applying mathematical thinking in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Competence in science refers to the willingness to use the body of knowledge and methodology employed to explain the natural world in order to identify questions and to draw evidence-based conclusions. Competence in technology is viewed as the application of that knowledge and methodology in response to perceived human wants or needs. Competence in science and technology involves an understanding of the changes caused by human activity and

[8] The table contains the generic definitions of key competences. For the respective definitions of knowledge, skills and attitudes, please see EU Recommendation http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11090_en.htm

Key competence	Explanation
	responsibility as an individual citizen.
Digital competence	Digital competence involves the confident and critical use of Information and Communication Technology (ICT) for work, leisure and communication. It is underpinned by basic skills in ICT.
Learning to learn	Learning to learn is pursuing and persisting in learning, organizing one's own learning, including through effective management of time and information, both individually and in groups.
Social and civic competences	Social competence covers all forms of behavior that equip individuals to participate in an effective and constructive way in social and working life, and particularly in increasingly diverse societies, and to resolve conflict where necessary. Civic competence equips individuals to fully participate in civic life, based on knowledge of social and political concepts and structures and a commitment to active and democratic participation.
Sense of initiative and entrepreneurship	Sense of initiative and entrepreneurship refers to an individual's turning of ideas into action. It includes creativity, innovation, risk-taking and ethical values, as well as the ability to plan and manage projects in order to achieve objectives.
Cultural awareness and expression	This refers to the creative expression of ideas, experiences and emotions in a range of media, including music, performing arts, literature, and the visual arts. It includes an appreciation of the importance of this creative expression.

Arguably, these competences are those that *'all individuals need for personal fulfillment and development, active citizenship, social inclusion and employment'* (2009, p. 12). Cross-curricular key competences are considered to be those competences that focus on integrated learning and have a focus in all subjects and activities in a school, represent common goals and are mutually complementary. The development of core-subjects should therefore *'be supported by transversal skills such as critical thinking, creativity, initiative, problem solving, risk assessment, decision-making, and the constructive management of feelings'* (2009, p. 11). In and out of work situations, it isn't as much the knowledge itself, but the way it is put in practice that is important. The ways in which we apply knowledge and develop problem-solving skills ultimately depends on less well-defined personal characteristics: *"our capacity for empathy, for co-operation, as much as our initiative and our autonomy; our capacity both to evaluate risk and to take risk; our ability to place actions in context, long and short-term"* (Carneiro, 2015, p. 109).

Lifelong learning is not *just* about serving economical progress or professional careers (Medel-Añonuevo, Ohsako, & Mauch, 2001). Lifelong learning policy, as suggested by the OECD, should cover *all purposeful learning activity*, and is characterized by the following four main features (OECD, 2004): (i) A systemic

view, which covers all learning happening in formal, non-formal, and informal learning. Learning opportunities must be created for all three learning contexts and these contexts need to be 'interlinked'; (ii) Secondly, the centrality of the learner is crucial, shifting away from the supply side of education to the demand side to meet each learner's needs, (iii) Thirdly, motivation is central to learning that continues throughout life and relates to the capacity for 'learning to learn' and self-directed learning, (iv) Fourthly, lifelong learning recognizes multiple goals of education – including personal and knowledge development, and economic as well as cultural and social objectives, with priorities shifting during a lifetime.

Nan-Zhao describes four perspectives on the notion of 'key competence' (Nan-Zhao, 2006). From a socio-psychological viewpoint, key competences are described in terms of *effective interaction to the physical, social, and cultural world*, whereas philosophers focus more on reflection and define competences as being independent of culture, context, and personal characteristics. Sociologists see competences as empowerment of individuals and groups to preserve autonomy and exercise their rights without violating others, and economists take a more practical interpretation that relates to productivity, income maximization, and an emphasis on knowledge and skills. This distinction between the economic viewpoint and the sociological can also be seen as the distinction between competency and competence. Mark Smith argues that competency is similar to 'skill', and in contrasting with 'competence' it is *"a narrower, more atomistic concept used to label particular abilities or episodes"* (M. K. Smith, 2005). In contrast, competence is linked with the Greek notion of arête, which means moral goodness, virtue, or general sense of goodness. It concerns the capacity of persons, their deep understanding, rather than just the skills they possess and the training they have enjoyed.

This broader focus toward lifelong learning is necessary, because global competition, technology, and other drivers of change, *not only* have an economic impact, but influence the social and cultural features of society as well. Being able to build and maintain strong democratic societies, in which a diversity of cultures and ideas is valued, a broader focus is required than just on competences, knowledge and attitudes needed for economic growth and global competition. It includes *'not only the key competences that relate to traditional school subjects but also those more cross-curricular (or 'transversal') key competences that enable people to pursue learning throughout their lives, contribute to democratic societies and to succeed in today's and tomorrow's world of work with its demand for high skills combined with creativity and the ability to innovate'* (EC, 2012a). Still, an important challenge for educators

remains, which is the establishment of accepted assessment procedures to evaluate meta-cognitive and critical thinking skills and attitudes (EC, 2010, 2012a; Gordon et al., 2009; PISA, 2007; Sharples et al., 2012; Spencer, Lucas, & Claxton, 2012).

In a discussion paper written for Kennisnet[9], Voogt compares five influential 21st century skills frameworks, and concludes that most seem to be driven by private business interests and economic imperatives. She states that *"there seems to be a conflict of interests between societal and individual needs as driving forces for 21st century skills. While economic and social needs are strongly stressed by most frameworks, the goals of individual learners and equity issues related to the right of every citizen to be prepared for society are less emphasized"* (Voogt & Roblin, 2010, p. 13). Similarly, there appears to be less emphasis on the educational rationale, which concerns the relevance of these 'new' skills in terms of educational quality, social relations in class, and other factors that influence the learning process and outcomes.

Equity and pedagogy are two essential components underpinning our research. Resilience and adaptability also depends on students' lifelong learning competencies, such as learning to learn, which requires teaching strategies and roles that are different from the traditional classroom setting. The influential UNESCO publication "Learning: The Treasure Within" rightly captured the comprehensive nature and the role of public education: *"A broad encompassing view of learning should aim to enable each individual to discover, unearth and enrich his or her creative potential, to reveal the treasure within each of us. This means going beyond an instrumental view of education as a process one submits to in order to achieve specific aims (in terms of skills, capacities or economic potential), to one that emphasizes the development of the complete person."* (UNESCO, 1996, p. 86)

It further offers a useful framework that illustrates the comprehensiveness of learning, which at the same time captures the core challenge for education. It states that learning must contribute to the all-round development of each individual and describes four fundamental principles of learning (Gordon et al., 2009; Nan-Zhao, 2006; UNESCO, 1996):

- **Learning to Know**. This implies 'mastering the instruments of knowledge themselves', and presupposes learning to learn. It includes the development of

[9] Kennisnet is the public organization for Education & ICT in the Netherlands, funded by the Ministry of Education, Culture and Science. It maintains a national ICT-infrastructure for education, and offers support and advice to the government and public educational institutes. More information can be found at https://www.kennisnet.nl/about-us/

the faculties of memory, imagination, reasoning, problem solving, and the ability to think in a coherent and critical way. It can be described as 'a process of discovery' and deep learning, involving genuine investigation of the information that is delivered through subject teaching. It sees learning as both means and end, as process as well as substance.

- **Learning to Do**. Learning to do, as expected, is more closely linked to practice, vocation, and work skills. However, it goes beyond the factual knowledge and skills, and includes the capacity to deal with a variety of situations, often unforeseeable, to work in teams. It is proposed that such competence and skills are more readily acquired if pupils and students have the opportunity to try out and develop their abilities by becoming involved in work experience schemes or social work while they are still in education, and highlights the importance of alternating study with work.
- **Learning to Live Together**. Developing an understanding of others, their history, traditions and cultural and spiritual values is essential for managing future conflicts in an intelligent and peaceful way. Called 'a necessary Utopia', it commits to better understanding of other people and the world at large and harmony – the very things that are most lacking in our world today.
- **Learning to Be**. In the 21st century people need to become independent and develop a stronger sense of personal responsibility for the realization of common goals. It underlines that no talent hidden in each individual should be left untapped, including the faculties of *'memory, reasoning power, imagination, physical ability, aesthetic sense, the aptitude to communicate with others and the natural charisma of the group leader, which again goes to prove the need for greater self-knowledge'* (UNESCO, 1996, p. 23).

The notion of comprehensive learning is not present in most existing programs in the EU that intend to prevent disconnection and marginalization. Many of these job-placement and reintegration programs use extrinsic, like payment or the possibility of a job at the end, to motivate youngsters. In most instances the motivation to learn is not addressed and the effect of these programs has shown to be rather limited (Vries & Hennis, 2013). Intrinsic motivation to learn is, as shown in the first chapter, essential for lifelong learning, and requires programs to not just look at 'knowing' and 'doing', but has to address 'being' as well. Every individual has a need for self-fulfillment, which *"consists in carrying to fruition one's deepest desires or one's worthiest capacities. It is a bringing of oneself to flourishing completion, an unfolding of what is strongest or best in oneself, so that it represents the successful culmination of one's aspirations or potentialities. In this way self-fulfillment betokens a life well lived, a life that is deeply satisfying, fruitful, and worthwhile."* (Gewirth, 1999, p. 3)

Addressing the need for self-fulfillment in education is especially relevant for the reAct target group, as personal issues as well as external conditions and factors puts them at risk of leading an unsatisfying, and possibly even destructive life. Self-

fulfillment is the ultimate goal of human striving: other goals and values are only relevant and have value insofar they serve human self-fulfillment. Self-fulfillment and an understanding of one's desires and ambitions enable people to take responsibility for their own future. Effectiveness of educational policies and programs aimed at fostering awareness, democratic values, religious and cultural diversity, aesthetics, and other realms of value depends on how well they contribute to the development or fruition of the human self of the individual participants (Gewirth, 1999). Self-fulfillment refers to 'some ideal' (end), often unattainable, and thus should be understood as both the 'ideal' goals and the development process wherein people achieve goals by unfolding some of their latent powers' (ibid). Self-fulfillment, hence, has extrinsic (obtained goals) as well as intrinsic (development process) characteristics that exist in education.

Programs must include provisions that ensure that participants are able to reflect on identity, desires, ambitions and personal characteristics that fosters a connection between 'what is taught' and 'what is thought'. On the other hand, a singular focus on self-fulfillment risks excluding other values, including those goods and rights of other people, which brings us to the third principle defined in Delors's seminal report, i.e. 'Learning to Live Together'. Interaction and collaboration and putting your 'self' and your ideas and desires in an intercultural and multicultural context is necessary as it contributes to social cohesion.

We decided to focus on developing an approach that would address 'Learning to Live Together' and 'Learning to be', following the argumentation below:

First, we described that engaging and effective learning depends on a variety of aspects and conditions that are beyond the direct influence of schools, including family background, welfare and social support systems. Lacking the time or divine power to enforce systemic change, the consortium decided to focus on developing an approach that focused on activities and processes that could be organized within classrooms and schools. A set of guiding principles was developed and discussed with local partners to ensure sustained involvement and local understanding. All stakeholders agreed that these principles should focus on intrinsic motivation, with the aim of reducing psychological barriers and obstacles to learn and to foster self-esteem and a more positive attitude towards learning, crucial in terms of lifelong learning.

In the context of lifelong learning, a focus on identity (learning to be) and social intercultural interaction (learning to live together) seems justified for addressing issues faced by at-risk youth (i.e. issues with belonging, self-esteem, learning skills, and attitude towards learning/education). Such an approach would give students the opportunity to explore their identity, *with* others and *within* a learning context. If successful, such an approach would benefit young people searching for a meaningful place in society, and, especially in the context of the current social crisis

in Europe, offer a more sustainable alternative to 'ordinary' programs focused narrowly on vocational training and education, second-chance education, or social integration.

Learning to Be: Identity and Agency

In the opening keynote of the International Congress of Lifelong Learning (November 2011), the head of the commission responsible for the UNESCO report, Jacques Delors, reflected on the seminal work (Delors, 2013). While addressing the problem in Europe with unemployed and uneducated youth, he argued that 'Learning to Be' remains the pivotal challenge in education:

"Learning to be is the most difficult thing of all: fully developing the creative potential of each individual, in all its richness and complexity. [..] The lack of self-confidence is a central issue for dropouts. A lack of self-confidence is also a lack of self-esteem. This means that learning to be at school is about enabling people to understand themselves better, without sinking into despair or delusion." (2013, p. 323). He concludes that lifelong learning is indeed about work and life, success in work and in the community, but *"on a deeper level, it is about knowing oneself better, I cannot stress this enough, gaining a kind of self-esteem to help us deal with the risks and constraints of life, and acquiring the ability to take control of our own lives."* (2013, p. 329)

'Learning to be' emerges as an essential, but often overlooked component in education, especially with respect to the problem of youth at risk of social exclusion.

Identity is defined here as a construct that consists of the following two components: i) a stable, core identity that has been largely constructed in the early years of life, and subsequently reinforced through continuous personal reflection, one's role in a family, organization, and other spheres and through attribution of significant events to a personally 'curated' biography, and ii) a more flexible and interactive structure of identity components that adapt and enrich identity based on more recent events and the environment that constitutes the self-understanding of personal identity (Antikainen, 1998; Illeris, 2007). The concept of identity here is relevant for three reasons.

i. First, from a psychological perspective; many youngsters in Europe are at risk of becoming marginalized citizens and living an unfulfilling live. Their identity is affected by a negative educational history, an inability to get employment, and other factors. This can ultimately harm their ability to advance socially and economically. By allowing these individuals to be engaged in activities that relate with a part of their identity that is more positively significant to them, and doing this in a learning environment, may help them overcome a negative association with learning. This process can appropriately be explained by self-affirmation theory (G. L. Cohen & Sherman, 2014). Starting from personal values, interests, and beliefs therefore is an important starting point for a process to reconstruct a more

positive image of self and an identity they are proud to manifest in public. An improved self-confidence further sustains and drives exploration and lifelong learning.

ii. Secondly, identity is relevant in the context of educational innovation. Addressing identity remains a pivotal pedagogical and educational challenge that is overlooked in formal educational systems – students often do not get opportunities to explore their interests, ambitions and skills. A focus on identity requires teachers to rethink their practice and to innovate.

iii. Thirdly, from a systemic perspective, we posit that a lack of interest in issues of identity within formal education has societal implications. The dynamics that drive education are imprinted in someone's identity, and drive the individual's mode of thought, emotion, and action, and ultimately find their way into society. Rather than technical reproduction (i.e. reproducing qualified workers), education also has the function of social reproduction, which addresses the social fabric of society and values, such as equality and equity.

Young people grow up in an era that is different from the world experienced by previous generations. The advancement of technology and the pace at which new information and knowledge is created, changed, and challenged, there is less certainty and growing insecurity (Giddens, 1991 in: Ross & Gray, 2005). Life is becoming complex for young people, as they have to negotiate a new set of hazards that affect on all aspects of their day-to-day lives, including social and societal issues such as weaker institutions, changing labor market conditions, and a decoupling of education and employment. Transitions from education to work have become more prolonged, diversified, unstable and uncertain (Pohl & Walther, 2007). Under these conditions, self-identity becomes fragile and subject to constant reinterpretation (ibid). Giddens calls this constant reinterpretation and construction of personal biographies in the light of changing experiences as a 'reflexive project'.

Rudd and Evans (1998) investigated the influences of structure and agency in young people's lives and their perception of 'control' over their own academic and professional futures. Structure is here defined as inputs from organizations at a national and local level, the effects of labor markets, and influences of broad social characteristics such as gender, social class and ethnicity and agency is the input from young people themselves on an individual basis. They found that young people, from different socio-economic environments, all attached *"considerable importance to individual effort and expressed an optimistic belief that if they worked hard and achieved suitable qualifications then they should be able to follow their own independent pathway through further education and into appropriate employment."* (1998, p. 61)

This supports the concept of agency, which recognizes young people as having a past and an imagined future both of which guide and shape actions in the present. This sense of agency is especially relevant in the context of young people considering opportunities and possibilities during the re-entry and reintegration process. In many cases, agency has already been expressed by the choices young people make to join a re-integration or training program (Ross & Gray, 2005). Agency is an important reAct principle, as it is considered central to young people's ability to change, make pragmatic choices, take responsibility for their transitions, and maintain aspirations when faced with considerable life challenges. Pohl and Walther use the term 'biographicity' for the *"competence needed to navigate through individualized and uncertain life courses and to construct meaningful biographies"* (Pohl & Walther, 2007, p. 535). It requires individuals to constantly assess and reflect on the balance between personal interests and needs on the one hand and external demands and opportunities on the other, and to integrate new experiences into a coherent learning biography (ibid).

Agency also relates with intrinsic motivation, and is explained by two factors: i) the subjective incentive of pursuing a certain goal resulting from interest or need; and ii) the expectation one has to be able to meet this goal by one's own action, hence control and self-efficacy (Rotgans & Schmidt, 2011). It is expected that agency (or autonomy) is expected to motivate students, because it allows them to engage cognitively with the task at hand.

As has been emphasized several times in this chapter, classroom practices should be placed in a educational system context: providing choice to young people (agency) does not overcome social inequality, because opportunities to make decisions that help move forward in a transition phase relates with the number as well as *the value* of available choices (structure), i.e. access to resources, networks and subjectively meaningful life perspectives. This is contingent to: *"having a choice between different options; starting from individual strengths and interests rather than from deficits and failures; keeping processes of guidance and counseling open rather than channeling job-seekers to low-status routes from the beginning; providing space for non-formal learning in terms of experimentation and self-determined projects; and addressing young people in a way that allows them to develop trust in institutions and professionals"* (Pohl & Walther, 2007, pp. 551–552). As suggested by Jang and others, engaging students in learning activities requires not autonomy support *or* structure, but autonomy support *and* structure (Jang, Reeve, & Deci, 2010).

The pedagogical implications of 'Learning to Be' were as follows: as a consortium, we decided to focus the approach on facilitating activities that supported students in *exploring their interests*, building *identity* in a social context, and to *take ownership* through a project-based approach that would explicitly give responsibility to students in choosing subject, direction and pace. Every student would be allowed to start a personal project, and they would be able to work on it individually or in a team. Gradually, through a *negotiation*

process between teachers and learners, connections would be made between the students' interests and the formal curriculum or formal requirements.

Learning to Live Together: creating positive interdependencies

"Learning to live together" adds a global, humanist lens to education and sees individuals as global citizens. It underlines UNESCO's mission to support people in understanding each other and working together to build a safe and peaceful world. In an increasingly multi-cultural and globalized Europe, which is challenged by political tensions, economic recession, social inequality and exclusion, learning to live together becomes ever more topical.

Although not at the center of the reAct approach (which is 'to engage at-risk youth'), interaction between participants from different contexts and environments was deemed appropriate for several reasons. The first is that inter-culturally competency helps them navigate through the complex heterogeneous environments in which they grow up. They are prepared to appreciate diversity as well as to manage conflicts in accordance with the values of pluralism and mutual understanding. The reAct consortium decided to follow the suggestion in *the Delors report* and introduce an international element to the project, with the intention of contribution to this mission:

"Learning to live together, by developing an understanding of others and their history, traditions and spiritual values and, on this basis, creating a new spirit which, guided by recognition of our growing interdependence and common analysis of these risks and challenges of the future, would induce people to implement common projects or to manage the inevitable conflicts in an intelligent and peaceful way" (UNESCO, 1996, p. 22)

The international component, in reAct: the *'International Project'*, was also expected to contribute to the motivation of participants, as has been shown in other research on motivational factors in mobility programs, such as the opportunity to meet new people and improving one's language skills (Novak, Slatinšek, & Devetak, 2013). The learning processes imparted by 'Learning to Live Together' then follows the interpretation in a more recent UNESCO report, which is to facilitate a process of *'discovery of others'*, which sets out to foster mutual understanding among students; *and* an *'experience of shared purposes'*, whereby students work together towards common goals.

3.2.3 Constructivism, Connectivism, Constructionism, and the Role of Technology

Developments in web technologies and more interactive and interconnected learning environments have resulted in the rise of three fundamental shifts in technology-enhanced learning: (i) a shift from a focus on content to communication, (ii) a shift from a passive to a more interactive engagement of students in the educational process, and (iii) a shift from a focus on individual learners to more socially situated learning (Rahimi, van den Berg, & Veen, 2013). ICT enables

learners to become more proactive to learning, not viewing their educational institute as the sole place where they can learn. They connect with peers, online and offline, and are participating in a process of building new knowledge and constructing their own online presence (Aresta, Pedro, Moreira, & Santos, 2011). Technology is key to the development of activities that generate and encourage collaborative learning and carry significant potential to increase engagement, such as taking initiative and responsibility for learning, using resources wisely, time on task, and having interest and desire to pursue information and learn in and beyond classrooms (Taylor & Parsons, 2011).

Spaces for socialization are particularly important in the context of reAct, as collaborative learning is often based on social constructivist tenets. The essence of learning, especially in the context of reAct, is not a process of transmitting and receiving information and knowledge, rather as a process of 'changing the relationship between a person and the world' (Limberg, 2007 in: Markless, 2009). The relevance of the social constructivism in the context of lifelong learning is clear when you consider the increased opportunities for collaborative and networked learning, participation in communities, peer-based learning. From an individual constructivist perspective, the ability to effectively judge, collect, ignore and use online information becomes increasingly important.

The central point of social-constructivism is an individual's making meaning of knowledge within a social context (Vygotsky, 1978). At the same time, the need to construct knowledge on students' prior knowledge appears more complicated in an increasingly interconnected information society and requires individuals to develop 'sense-making' abilities, or in a broader sense: information literacy. Many 21st century skills frameworks emphasize the need for ICT skills or information literacy, which can be defined as the capacity to access information efficiently and effectively, to evaluate information critically and competently, and to use information accurately and creatively (Lau, 2006). It demands interpersonal communication skills, visual literacy, an ability to deal with nonlinear knowledge representations, personal information management literacy, multimodal information processing, and navigational skills (Voogt & Roblin, 2010). From a functional perspective, three main roles can be identified for the implementation of technology in a learning environment: technology can be used to *support learning*, to *deliver education*, or as *part of the curriculum* (learning about technology) (ibid).

Given the rise of interactive network technology, the logical direction for education and learning to develop, as society ever more embraces the uniqueness of each individual, is for the process of learning to become more natural. As people can learn from any new experience, and what they learn often is unpredictable, there isn't a real way in which the optimum level of development for each individual can be reached through structured education. Accepting that the outcome of learning cannot be controlled up front, would lead to a more natural form of learning.

Technological advances have made it possible for people to start learning this self-regulated, non-linear way; our most natural way of learning (Siemens, 2006), by pursuing personal goals in changing learning environments. Importantly, various researchers have demonstrated that self-directed learning and complex information spaces can result in high levels of cognitive load that could lead to disengagement (Brennan, 2013; P. A. Kirschner & Clark, 2006).

Inspired by advances in information and computing technology, newer theories and pedagogies have emerged that emphasize the importance of making connections with ideas, facts, people, and communities (Bell, 2010; de Laat, Lally, Simons, & Wenger, 2006; Downes, 2005; Siemens & Matheos, 2010). Networked learning focuses on interconnectedness between people and between people and resources (de Laat, 2006). Not just memorization and deep understanding, but the importance of learning how to find information and where. Connectivism explains learning as a distributed and networked process: because knowledge is distributed across a network of connections, learning itself is defined as the ability to construct and traverse those networks (Siemens, 2005). It extends the notion of learning as a personal, internal change (Illeris, 2007) to a network change: Non-human elements act as actors in the network and the medium itself is part of wider networks. To be able to work in a network, an individual must be able to outsource tasks, must be able to keep track of connected resources, must be able to value information, context and sources, and must be able to cooperate with others. Because learning practices and social practices are interconnected, the learning is characterized by emergence rather than instruction: learning is not designed, but rather designed for, and variation in levels of expertise can expand the group's learning. This implies a pedagogy that seeks to describe 'successful' networks, as identified by their properties, such as diversity, autonomy, openness, and connectivity; and seeks to describe the practices that lead to such networks, both in the individual and in society (Downes, 2005).

Digital technologies have long been heralded as opportunities to foster creativity in educational contexts and as tools for social change.

As for creativity, the use of technology in education can be conceptualized within constructionist learning theories. Constructionist learning is inspired by (social) constructivism, as that both consider learning as a process of constructing mental models to understand the world. However, constructionism posits that that learning happens most effectively when people are creative and involved in *building* and *sharing* objects (Papert & Harel, 1991). It can therefore also be phrased in relation with experiential learning. A pedagogy that aims to foster creativity should be based on intrinsic motivation and as little as possible on extrinsic incentives (Spendlove, 2008).

As an emancipatory tool, a young Paolo Blikstein beautifully phrased his vision about the role of technology *"for mobilizing change in schools and empowering students. I posit that the rapid penetration of computers into learning environments constitute an unprecedented opportunity to advance and disseminate a Freirean aesthetic in schools. Digital technologies, such as computers, robotics, digital video, and digital photography, could play a central role in this process: they are protean machines that enable diverse and innovative ways of working, expressing, and building. This chameleonesque adaptivity of computational media, I argue, enables the acknowledgement and embracing of epistemological diversity, engendering an environment in which students, finding their own voice, can concretize their ideas and projects with motivation and engagement"* (Blikstein, 2008, p. 2)

The principle of 'learning to be' and the concept of self-fulfillment can be related to Freire's definition of humanization as a process of 'authentic liberation'; becoming more fully human and struggling against oppressive manipulation and control. Freire's so-called 'ontological vocation' takes the human capacity to change as a central point of departure in his pragmatic educational philosophy, and resists objectification and oppression of people by encouraging critical dialogue with and about their everyday environments (Ramos & Freire, 2009). In a pre-Internet era, Illich imagined how technologies would support learning communities, a vision about a 'convivial society'[10] that appears to be materialized online, but has not yet found its way to the formal education system:

"But the idea remains the same: they should be able to meet around a problem chosen and defined by their own initiative. Creative, exploratory learning requires peers currently puzzled about the same terms or problems. Large universities make the futile attempt to match them by multiplying their courses, and they generally fail since they are bound to curriculum, course structure, and bureaucratic administration. In schools, including universities, most resources are spent to purchase the time and motivation of a limited number of people to take up predetermined problems in a ritually defined setting. The most radical alternative to school would be a network or service which gave each man the same opportunity to share his current concern with others motivated by the same concern." (Illich, 1971, p. 10)

In the context of reAct, we considered to focus primarily on the *instrumental value of*

[10] Convivial education proposes that people should learn by pursuing their own interests with others who have similar interests, for the sake of expanding their understanding and imagination and ability to relate more deeply to the things of the world, and not for the sake of certification and securing a high paying position.

technology, and, through practice and experience, to *learn about* the technologies used. As supportive technology, the focus would be on technologies that would allow students to create artifacts, connect with peers (independent of distance), collaborate, and explore interests using the Internet. The potential to support creativity, interaction, sharing and collaboration, and inquiry-based learning would be the main criteria on which tools would be selected.

These criteria are likely to be met by so-called Web 2.0 tools and social media, which have been briefly discussed in the first chapter (section 1.1.3), as technologies to facilitate the construction of personal learning environments (PLE). PLE is a concept based on socio-cultural and constructivist theories of learning and knowledge building and are considered to have the *"potential to support collaborative learning, communities of practice, personal development, self-directed and lifelong learning"* (Rahimi et al., 2013, p. 2223). PLEs allow student to have control over the educational process, which is essential in the context of exploring one's interests *and* discovering the utility and usefulness of various tools. Ultimately, it is expected that learner control is more intrinsically rewarding. On the other hand, some point to concerns related with the use of the Internet, and how 'having facts at your fingertips' can be at the expense of creative and independent thinking (Rowlands et al., 2008).

3.3 Motivation and Engagement

Two essential concepts in this research are motivation and engagement. First we explain different definitions and then suggest a way to integrate the two interrelated concepts, which is then followed by a more extensive elaboration of the relevant theories.

3.3.1 Motivation versus Engagement

Motivation is the psychological feature that arouses an organism to act towards a desired goal and elicits, controls, and sustains certain goal directed behaviors (Cheng & Yeh, 2009). Motivation may be rooted in a basic impulse to optimize well-being, minimize physical pain and maximize pleasure. It can also originate from specific physical needs such as eating, sleeping/resting, and sex.

Engagement is the extent to which students identify with and appreciate learning outcomes, and the level of participation in academic and non-academic school activities. Engagement represents both a psychological component (attitude) and the behavior (Jon Douglas Willms, 2003). The psychological component refers to school commitment and sense of belonging (Furlong & Christenson, 2008), and to the perceived relevance of the education: whether or not it will benefit them personally and economically. Engaged learners show sustained and persistent behavioral involvement in activities accompanied by a positive emotional tone (Rotgans & Schmidt, 2011). In the context of learning, these include selecting tasks at the border of their competencies, initiating action when given the opportunity, and exerting effort and concentration in the implementation of learning tasks; they show generally positive emotions during ongoing action, including enthusiasm, optimism, curiosity, and interest (Skinner & Belmont, 1993).

Newmann, Wehlage, and Lamborn state that engagement implies more than motivation, and define it as a learner's *'psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote'* (1992, p. 12). Shernoff et al. approach engagement from the perspective of flow theory (Csikszentmihalyi, 1990) and define it as a function of concentration, interest, and enjoyment in an activity (Shernoff et al., 2003). Cambourne argues that engagement is a merger of multiple qualities that entails holding a purpose, seeking to understand, believing in one's own capability, and taking responsibility for learning (Cambourne, 1995). Engagement, in the context of reading, is a merger of motivation and thoughtfulness: *'Engaged readers seek to understand; they enjoy learning and they believe in their reading abilities. They are mastery oriented, intrinsically motivated, and have self-efficacy'* (J. T. Guthrie & Cox, 2001).

So, what then is the difference between a motivated learner and an engaged learner? Although engagement can be defined narrowly as a particular psychological state of focus or involvement in a moment of time, we opt for a broader definition that emphasizes the importance of *being and acting engaged over time* in order to discriminate it from motivation. It makes a distinction between those who learn for school and *those who learn for life*. Engagement refers to both the psychological state and the resulting behavior (being engaged/disengaged), whereas motivation is the psychological condition underlying engagement. In other words, motivation leads to engagement (Irvin, Meltzer, & Dukes, 2007).

3.3.2 Intrinsic versus Extrinsic Motivation

In motivation theory, and in this study, the distinction is made between extrinsic and intrinsic motivations. If you are intrinsically motivated while doing a certain (learning) task, it means that you are motivated because of the inherent satisfaction you get from the activity itself (R. M. Ryan & Deci, 2000a). It emerges from psychological needs, personal curiosities, and innate strivings for growth. Extrinsically motivated people do something because of external incentives, rewards or pressures. Extrinsic motivation can be less sustainable because it decreases as soon as the instrumental goal is achieved or external pressure ceases (Deci et al., 2001).

People are driven by intrinsic and extrinsic motivations all the time. For example, food can be enjoyable (intrinsic); it keeps you from being hungry (extrinsic), or both (you eat something delicious when you are hungry). 'Not eating', on the other hand, is nearly always extrinsic (losing weight, risk on food poisoning, lack of food). Intrinsic and extrinsic motivations interact, sometimes positively, and sometimes negatively (Cameron, Banko, & Pierce, 2001; Deci et al., 2001; Lepper et al., 1973). Malone and Lepper propose four characteristics that are common to all intrinsically

motivating learning environments: challenge, fantasy, curiosity, and control (T. W. Malone & Lepper, 1987).

Lepper argues that intrinsic motivational orientation may have significant instructional benefits (Lepper, 1988). Although extrinsic incentives can be effective in directing learners and providing strong incentives to perform, there are several benefits for focusing on intrinsic motivations. Extrinsically motivated learners could minimize their effort to do a certain task when the reinforcement stops, while intrinsically motivated learners are more likely to select challenging tasks (Cheng & Yeh, 2009). Moreover, (i) learners learn and apprehend more when intrinsically motivated (R. M. Ryan & Deci, 2000b), (ii) gain better conceptual understanding and promotes greater creativity (Spendlove, 2008), (iii) and intrinsic motivation is associated with greater pleasure and more active involvement in the tasks (Stipek, 1996). The *intrinsic* nature of engagement is important, because it leads to a more sustainable interest in learning (Pohl & Walther, 2007).

The distinction between intrinsic and extrinsic motivation is relevant in the context of engagement: motivation can result in engaged behavior, but not necessarily engaged being. The distinction can also be placed within literature on structure and autonomy support. Structured learning environments are more likely to result in behavioral engagement, while autonomy support (teachers who take students' personal interests and goals into account and foster curiosity) is more likely to foster cognitive engagement (Jang et al., 2010; Rotgans & Schmidt, 2011). The diagram below aims to depict this relation.

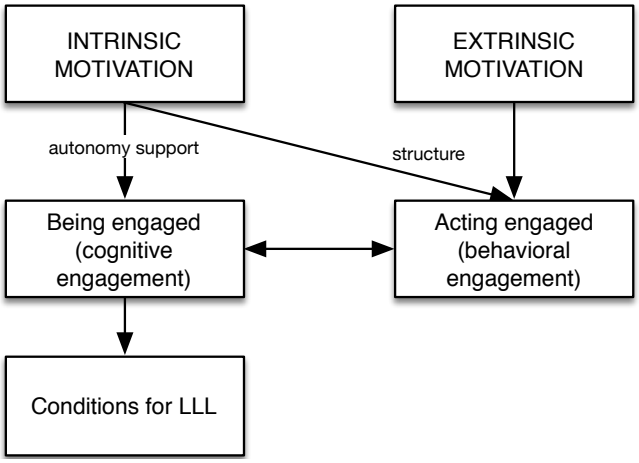

Figure 11 – Motivation versus Engagement

The motivations for people to behave as they do are described by theories that address human needs. The most famous example of such a theory is Maslow's hierarchy of needs theory (Maslow, 1943). In it, he describes different needs: (1) physiological needs; (2) safety needs; (3) love and belongingness needs; (4) esteem needs; and (5) needs for self-actualization. He argued that the needs form a hierarchy and that they need to be addressed accordingly: first the lower order

needs have to be satisfied, before the higher order needs will become relevant. Various researchers have criticized the notion that lower order needs have to be satisfied before higher order needs (i.e. Geller, 1982), but the ideas conceptualized in his theory of human needs persist (L. Cohen, Manion, & Morrison, 2007; D. W. Johnson & Johnson, 2009; R. M. Ryan & Deci, 2000a). Reeve restructured and improved Maslow's theory of human needs with the following types of needs: physiological needs (thirst, hunger and sex), psychological needs (autonomy, competence and relatedness) and social needs (achievement, affiliation and power) (Johnmarshall Reeve, 2008).

Most people have the intrinsic need to feel competent (White, 1959), and the need to feel self-determining (R. M. Ryan & Deci, 2000b). Self-determination refers to the idea that people want to believe they can choose to engage in activities of their own volition. Choice and task ownership are important ingredients to support self-determination. It identifies three human needs, which, when satisfied, increase self-motivation, personal growth and well-being. These are the needs for competence, relatedness, and autonomy (R. M. Ryan & Deci, 2000b):

Competence relates with the idea that social-contextual events (e.g., feedback, communication, rewards) that make individuals feel competent enhance intrinsic motivation. The pedagogical implication is that teachers need to formulate or create optimal challenges for students and be sensitive about the way feedback is provided. Students need to feel that the progress they make is due to their own competence, rather than following instruction. It relates with *autonomy*, which is the choice students have, acknowledgements of feelings and respectful treatment of ideas and suggestions, as well as offering opportunities to take ownership and guide the learning process, leading to higher levels of intrinsic motivation, curiosity, and less risk-avoidance. Self-regulated learning emphasizes responsibility of students to take charge of their own learning (Paris & Winograd, 2003). It relates with (social) constructivist learning theories and follows from research into learner's motivation (i.e., self-efficacy, self-determination, goal-setting) (Montalvo & Torres, 2004). They argue that learners should be active participants in the learning environment and in the learning process. As we have seen in the previous section on lifelong learning, such skills are considered critical to successfully navigate a complex, networked society. In relation to resistance to learning, Illeris commented that *"it is a fact that young people and adults are far more prepared to mobilize the mental energy necessary for accommodative and transformative learning processes if they, themselves, can play a part in deciding what the learning is about and the forms of activity that are utilized. It is also inherent here that their attitudes will typically be less defensive."* (Illeris, 2007, p. 245)

Finally, *relatedness*, concerns the environment in which is learned, which should be secure and trusting environment that fosters social belonging. Relatedness is feeling special to someone or having a positive relationship with someone. It gives one the

feeling that, if things don't work out, or the outcomes are not as expected, he or she is able to fall back and be supported. It promotes exploration, creativity and engaging with others freely (Furrer & Skinner, 2003).

A trusting learning environment is one that makes a learner feel accepted and comfortable to say anything. Teachers as well as peers should be aware of their presence and behavior, and the influence this has on the overall level of trust. A trusting environment is also one in which teachers and students make an effort to increase their self-confidence and confidence in others. It puts responsibility of learning tasks in the hands of learners and addresses the *self-efficacy* of learners. Self-efficacy is one's belief in the ability to perform a specific task, and is central to human motivation (Albert Bandura, 1997), but also predicts the likeliness that a learner shares its knowledge with others (Endres, Endres, Chowdhury, & Alam, 2007). Learners who have a high level of self-efficacy are more likely to choose challenging tasks and use strategies to accomplish those tasks (Schunk & Zimmerman, 2003). The availability of strategies to deal with the task at hand increases the self-efficacy of learners, who otherwise will be frightened by the task. *Giving trust* to a learner to organize one's own learning should therefore be combined with the provision or teaching of learning strategies. The focus is less on content (what should be learned), rather on how can be learned.

3.3.3 Principles to Engage Learners

Engagement is conceptualized as 'a state of being' that is highly influenced by contextual factors and conditions – home, school, and peers – in relation to the capacity of each to provide consistent support for student learning (Wentzel, 1998). Learners engage with a learning activity, when they belief that (i) they are potential doers or performers of the learning activity that lies ahead of them, (ii) engagement with the activity will improve their lives, and (iii) they can engage free from anxiety and fear to be reprimanded or reproached (Cambourne, 1995). The probability of engagement to occur increases when the following conditions are optimally present:

- Ability to immerse oneself in functional, realistic, and non-artificial ways;
- Demonstrations given by someone the learner trusts and respects;
- Expectancy to be able to successfully participate in or finish the activity;
- Ability to take responsibility for choices;
- Getting feedback in a timely, effective, nonthreatening, and appropriate way.

Following constructivist learning approaches, Kearsley and Shneiderman developed an engagement theory in which they propose three basic principles for engagement into learning: (1) Relate: learning through collaboration, (2) Create: learning using a project-based approach, and (3) Donate: learning using an outside (authentic) focus (Kearsley & Shneiderman, 1998).

The first principle, *relate*, discusses the importance of collaboration in the learning process. Kearsley and Shneiderman believe that educational activities must

emphasize team efforts that involve communication, planning, management, and social skills. The authors further explain that when students are able to discuss and defend their ideas a student's motivation to learn increases.

The second principle, *create*, describes the need for project-based learning. A *"creative"* and *"purposeful"* activity is a critical component of engaging learners. Through defining, organizing, and completing their own project, students establish a sense of ownership of the project and of their own learning. This aids in the motivation to continue learning and to develop academic and social skills.

The third principle, *donate*, identifies the need for projects to have a meaningful and realistic focus. Ideally, each project has an authentic, real customer, such as a study group, community organization, school, or local business. Through the addition of realistic projects, students can be better prepared when they enter the workforce in a given field.

Following several motivation theories, and with a focus on instructional design, Cheng and Yeh created the ARCS model, which identifies four subsequent steps or conditions that need to be met in order for people to become or stay motivated in learning (Cheng & Yeh, 2009).

- The first prerequisite or condition is to gain and sustain *attention*; this can be achieved through the introduction of unexpected events to arouse the learner's curiosity and interest.
- What follows is *relevance*; the learner is more likely to be motivated if he or she can relate to the content of the instruction or that it corresponds to his or her perceived needs. However, relevance doesn't just concern the content (topics) itself, the delivery methods and strategies can also be perceived as relevant (i.e. the use of social software in the classroom).
- The third condition is the learner's *expectancy to succeed*, similar to the abovementioned expectancy condition (Cambourne, 1995). Expectancy theories relate with being in control, self-confidence, self-determination, and self-efficacy (Albert Bandura, 1997; Jang et al., 2010; R. M. Ryan & Deci, 2000a; Stipek, 1996 and more).
- Finally, the model describes the *promotion of satisfaction* as an essential element of motivation: if learners feel good about their achievements and they are consistent with their expectations, their motivation may result in engagement.

Other research points to a multitude of factors that influence engagement and motivation of learners, including the learner's sense of relatedness at school (towards peers en teachers) (Skinner & Belmont, 1993), a focus on cooperation rather than competition (R. T. Johnson & Johnson, 1994), attendance of teachers to not only knowledge requests, but also to social needs and issues (Allison M Ryan, Gheen, & Midgley, 1998). Teacher support refers to the extent to which students perceive their teachers value personal relationships with them and the teacher's

ability to take away anxiety or nervousness related with disappointing learning outcomes (A. M Ryan & Patrick, 2001). Taylor and Parsons propose a number of similar categories related with student engagement, which are i) Interaction: Positive relationships, respect, interdependence, connections beyond school; ii) Exploration: inquiry-based, problem-based learning; iii) Relevancy: real-life scenarios, authenticity, personally meaningful, connecting with long-term goals, cultural sensitivity, responsibility; iv) Multimedia & Technology: global interaction, creativity, taking ownership; v) Assessment for learning: co-creation of assessment criteria, personal feedback (Taylor & Parsons, 2011).

It's important to understand engagement as a function of the learning task at hand: some tasks are more engaging than others, because they offer different levels of autonomy (Rotgans & Schmidt, 2011). For instance, listening to a lecture is predicted to be less cognitively engaging, because it allows for limited autonomy, while searching for information on the Internet or engaging in discussions and working in groups are likely to result in higher levels of engagement. With respect to group work, the group dynamics are essential: groups with a few dominant players are less likely to result in engagement than groups that have a more collaborative way of working. Teachers may need to ensure that team members establish a common goal and in structuring tasks (R. T. Johnson & Johnson, 1994).

This chapter addressed the core topic of our research, which is engagement. We started with an attempt to untangle motivation and engagement, and established the relationship between intrinsic motivation and 'being engaged' or cognitive engagement (which contrasts with 'acting engaged' or behavioral engagement). Teachers should aim to create the conditions in which students develop an attitude that intrinsically motivates them to 'learn for life' rather than to 'learn for school'. We combined the pedagogical principles and strategies from our literature review and linked those with basic human needs and emotions (following Johnmarshall Reeve, 2008), resulting in the overview below.

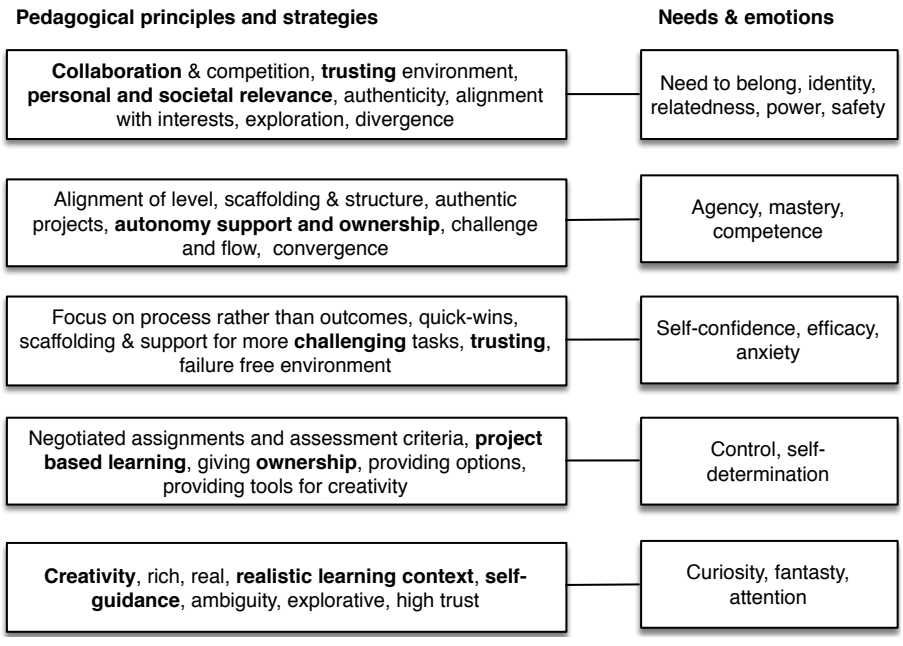

Figure 12 – Needs, emotions and pedagogy

3.4 Exemplary Initiatives

A third step in the development of the reAct framework was the investigation of a small number of relevant projects and initiatives through interviews and visits. The idea behind this exercise was to develop a better understanding of the practical implications of terms like 'agency', 'identity', 'trust' or 'entrepreneurship' in an educational setting. Moreover, these initiatives would provide partners and local teachers with relevant input and inform the development of activities.

We chose two exemplary initiatives based on their pedagogical 'formula', which had to have considerable overlap with the initial results from the literature review.

i. The first initiative we chose to include was UrWay, a project headed by Veen[11] and based on pedagogical principles of the successful UK-based NotSchool project.
ii. The second initiative we chose to investigate was Knowmads, which had its roots in the well-known Danish initative KaosPilots. In an earlier research, we followed students and interviewed teachers and the managers of the Dutch KaosPilots branch. During reAct, we found out that the school had 'pivoted' into a new school in Amsterdam, called Knowmads, which was based on a similar set of pedagogical principles.

Combined, the initiatives offer an interesting perspective on self-organization, trust, agency, collaboration, and use of ICT in different educational contexts and for different target groups.

3.4.1 UrWay – Trust, identity, and self-esteem

UrWay.nl was an online learning facility for youths of schooling age (secondary education), who were demonstrably failing within the regular school system. The UrWay.nl program aimed at getting school dropouts to enjoy learning again. Instead of 'pushing' knowledge towards the school dropouts, the UrWay concept invited them (seduced them) to explore their own interests and expand their own capacities. By letting go of the 'obligation to achieve', participants experienced the relaxedness and freedom to explore and develop their own qualities, at their own pace. This allowed them to regain confidence in their own capacities, and provides a

[11] Prof. Veen, as the main promoter, was responsible for the supervision of this research and the reAct project. He was approached to be part of the reAct project for this reason.

basis for further growth and development. UrWay's success was based on the following principles:

- UrWay was always available;
- UrWay approached everything positively;
- UrWay aimed at what participants can do well;
- UrWay worked with coaches with relevant (educational) backgrounds;
- UrWay provided relaxedness and safety.

Target Group

UrWay was targeted at generally vulnerable youths that have become dislodged or discouraged within the current education system and for whom other solutions have failed. Many were challenged by psychological problems or disorders. UrWay offered a safe, failure-free, online learning environment and community. Online coaches from all around the Netherlands worked together with a regional support organization that was located close to the youths themselves. Through the interaction between coach and participant, a custom learning route was gradually developed that fit with the personal interests (and thus the intrinsic motivation) of a participant. Participants construct their own portfolios to show which competences and skills they have developed during their time in UrWay.

For teenagers that apply to UrWay, regular education is not an option, either due to personal circumstances, or due to circumstances in the teenager's direct environment (e.g. teen moms, chronic illness). UrWay targeted school dropouts that had not attended school in a long time; had structural problems with no chance of immediate return to school or work; had the commitment of at least one parent or caretaker, and stability in the home environment; and were aged 15 to 17 years old.

Coaches and Organization

Coaches at UrWay were educational professionals, who were certified teachers in a subject matter *and* who had received additional training in coaching. They provided individual guidance and provided the participants with assignments based on the participant's interests. For this they use email and chat; they worked from home (or some other place), but in any case they never met the participants personally. This was intentional; coaches had some degree of anonymity, which in online communication actually lowered the threshold for personal contact between participant and coach. Coaches tried to find the interests of the participants, and used those to suggest opportunities for 'research' and learning, to explore opportunities, and to challenge the participants.

UrWay was organized into a National Team that focused on coordinating activities, and a Local Team – the regional support organization that housed close to the participant's home region(s). At the regional level, the Local team accompanied a maximum of sixty participants and ten coaches. Every coach guided about six

participants. The Local Team was managed by the National Team that oversaw finance and HRM.

The Local Team tried to build a relationship with the participants and their family, in order to be both accessible and approachable during (family) crises, but also to celebrate participant's personal successes. The Local Team hotline was available 24/7. The Local Team reviewed the weekly reports of the coaches to filter any important events or happenings.

Pedagogy: No pressure, semantics, and equality of topics

The starting point of UrWay was that all children want to learn, but that not every child fits within the regular education system. UrWay.nl assumed that all children have an intrinsic motivation to learn that has been damaged over time. To transform the suspicion of learning into a trust of learning, positive feedback was used. UrWay offered a failure-free environment that doesn't revolve around correcting errors, but was focused on appreciating the achievements of participants. UrWay was free of external pressure to perform.

Self-guidance was an important component of UrWay: participants determined for themselves what they learn, because learning from your own talents and passions is highly motivating. UrWay trusted on the abilities of the participants to know what they wanted to learn, and that they were able to take responsibility for their learning. Every participant's unique interests and capabilities were valued and used to facilitate the development of personal learning trajectories.

Participants were not assessed for a grade; evaluation followed from what each individual actually did. Every participant was allowed (and encouraged) to ask for informal certification for something they had done. There was a sense of equality of subjects: language and math were treated as equally important as fashion or online games. It all depended on what the participant desired to focus on.

Semantics were important: school-terminology was minimized as much as possible; a 'researcher' referred to a student, 'work' or 'research' was used instead of 'assignment', and learning was 'doing research'.

The use of ICT

UrWay used a learning arrangement that was heavily dependent on ICT. The idea behind it was that the virtual community created a necessary distance to other participants and coaches, and thereby reduced the threat of interacting with them. UrWay.nl was experienced as being comfortable and safe at the same time.

UrWay.nl can be described as a closed online community and learning environment that was available 24/7 (using an Internet connection). This learning environment (FirstClass) was the central hub of the UrWay concept. All participants in the UrWay.nl project were given a PC, a printer, a webcam and a broadband Internet connection.

Research Approach and Results

These results have been established based on ten interviews with coaches and experts involved in the project, and members of local teams. Half were conducted by telephone, the other half during a face-to-face meeting. In addition, ten case studies have been created from ten individual participants that describe the background of each participant, his/her behavior within UrWay, the results and possible follow-up. These case studies were made using quantitative and descriptive data as well as interviews with the participants.

All interviews were recorded on video. The interviews were open, semi-structured interviews and addressed the following issues:

i. UrWay effects
ii. Changes within the participants (learning, attitude, family situation, anything)
iii. Comparing the learning in formal education with UrWay
iv. How students deal with the relative high level of freedom
v. The local team
vi. Applicability of the UrWay approach
vii. Avoiding UrWay dropouts

The most remarkable outcome was that all students expressed a strong desire to learn. However, few of them were able to clearly express their learning goals right from the start; proactive consultation and interaction by the coaches was more effective than waiting until the students came with their own questions. The concept, after students had formulated their interests and goals, and in particular the online environment, seemed to work very effectively. Students were intrinsically motivated to participate, and most were logged in for about 30 hours per week, chatting with coaches and with each other, and giving each other advice. There was a strong sense of belonging, as all participants initially felt 'outcasts' of society. The biggest obstacle for learning was the stigma, often attached to them at a young age, that they weren't good learners. The pressure from the formal system was gone (by participating in UrWay, the students were not obliged to participate in formal education). In most cases, the family situation improved significantly, due to the absence of school-related stress.

The relative distance of coaches was important to foster a community of learners. Furthermore, coaches deemed it essential to be aware of the underlying problems of each individual participant, but in their advice and interaction, to address these issues only when necessary. A positive psychology attitude was adopted to stimulate the participants and focus on what works, not on what doesn't work. In time, this resulted in a more positive image of self, and more self-confidence and self-esteem. Nearly all participants demonstrated enjoyment and an increasingly positive attitude and demonstrated improved social skills online and at home. The participants

became more aware of their own future and started to think about what kind of life they want for themselves. They reflected positively on their own ability to learn.

One of the challenges identified by the coaches was that finding relevant and appropriate content was difficult. The interests expressed by the students were diverse, and although these interests were covered in part by Internet sources, it wasn't as sufficient. In some occasions, connections with local schools and organizations, and with experts, were useful in developing learning tracks that aligned with their interests. Another challenge was the transition from UrWay – as a protective area – to 'the real world', such as high school or work.

Through UrWay, 71% of the participant found work or went back into education. A small number went into professional care, and 10% disengaged from UrWay without specific plans. For most of the participants who left UrWay without a plan, and those who disengaged during the year, factors were identified that had no direct relation with UrWay.

UrWay differs considerably from reAct in terms of support (coaches, local team, comprehensive support using coaches, local experts, 24/7 hotline, continuous monitoring), target group (all dropouts with significant personal or psychological issues), and environment (online community, outside school). Still it offers considerable lessons for reAct, in particular with regard to the following principles:

- Start from students' interests, but try to mitigate between available and appropriate content and purely interest-based learning;
- Online community – an online environment should be available at all times to all participants to chat and interact safely ('mediated interaction' can feel safer). Local online communities could be used to facilitate interaction between teachers and their students;
- Formative assessment based on what students have actually done, not what was supposed to do – celebrate achievements, use informal certificates to help students gain confidence;
- Positive psychology, positive pressure (in the beginning), fail-free environment to foster trust;
- Semantics: avoiding school terminology;
- Finding relevant content is challenging.

3.4.2 KaosPilots and Knowmads – entrepreneurship and self-organization

Knowmads is a small, low-budget private school Amsterdam for social entrepreneurs[12]. Students are explicitly involved in co-creating and managing the learning environment, ranging from creating the curriculum to promoting the school

[12] http://knowmads.nl

among potential newcomers. It is a business school where education students co-create their own education, and where learning happens by doing projects collaboratively in a real context. The institution operates in a network of companies and individuals, who support the program with challenges, projects, people, and methodologies. The school is founded after – in 2010 – KaosPilots NL ended, assuming many of the same core principles.[13]

Organization and Program

The core program (methods and tools) of Knowmads is taught using a core group of (about 10) teachers, and additional activities organized by the students or by external experts. It is a business school, and part of the curriculum is filled through collaboration with relevant external organizations.

Once or twice a month, relevant experts (such as Seth Godin or Itay Talgam) give a lecture that challenges students and their beliefs. The lecture can be about anything (i.e. conflicts, marketing, Nietzsche & Buddhism) and is aimed to inspire and initiate thinking. Lecturers are invited by staff, students, or some even come at their own volition.

Several methodologies are used in the program, including Startup Wheel, e-marketing, green marketing, self-esteem (Matthew McKay), Art of Hosting, Appreciative Inquiry, Scenario Learning, and 'Deep democracy'. Methods and tools are searched for and used depending on the context of the project or educational objective. The partner projects (projects with organizations) have an important place within the curriculum, which is further co-created by students themselves. Students are expected to contribute to the school's mission by being a social entrepreneur and seeking opportunities.

Pedagogical Principles

Each of the new students is asked 4 questions at the beginning that guide the program:

- In what kind of world do we live?
- In what kind of world do you want to live?
- Who am I and what do I want to bring into this world?
- How do I identify and market my ideas and myself?

Knowmads adopts the principles of autonomy, motivation, collaboration, diversity, and entrepreneurship in a social setting. Their program is guided by the four

[13] An elaborate description of KaosPilots NL can be found in (Hennis & Veen, 2009)

questions and structured around a number of topics: (i) Entrepreneurship and New Business Design (ii) Social Innovation and Sustainability, (iii) Marketing & Creativity, (iv) (Personal) Leadership, (v) (International) Project Design, (vi) Process Design.

Learning by doing is an essential element of the school. "Doing" does not mean doing a case study or some fictional project, but creating something that will be used and by being part of a real-life (sometimes international) project. Projects are usually focused on sustainability and social innovation. Various methodologies are taught that address marketing, creativity, project and process design in order to come up with sustainable, marketable, innovative, feasible and accepted project plans. To emphasize a reality-oriented learning environment the students work with assignments and projects defined by real clients that reflect real needs and challenges outside the school. Taking risks by investing financially in one's own education is an additional factor that will allow students to grow and be trained in a maximum reality setting.

Peer-Assessment & Reflection

"Getting stuck in order to fly": learning can be a difficult and emotional road, because situations may seem problematic and solutions may not be at hand. It is the intention to allow this to happen and to overcome the problems in a collaborative setting.

Reflection is an essential element: the ability to learn as a team and use the diversity of the team to rise above a problem situation. An effective learning setting is one where you can express doubts and share critique. Because each individual is going through a personalized learning process, there is no standard assessment or accreditation. Students are asked to reflect twice a month using the "learning wall", where they present what they have learned and then get feedback from peers.

At the end of the year there is a final project/assessment: the "Rite of Passage". The four questions (above) are put central in the project. Each student is asked to express what they have learned in whatever form they want to (i.e. workshop, film, art installation, etc.). Each student will receive a personalized certificate with a story about him/her and tips for the future.

Client-Assessment

Crucially, Knowmads is an enterprise that needs to survive in a competitive environment. The students manage the enterprise in close collaboration with the staff, and determine the strategy and identity of the school. Chaos and complexity are deliberate part of the curriculum and organizational structure: there is very limited high-level control over what the students must do or know. Because students are in fact working for the partners, they are assessed according to market

standards. Instead of grades, rewards are defined in terms of client satisfaction, market impact, and financial compensation.

Autonomy

Students must follow their intuition and take a chance. Knowmads intends to create a space where you can manifest yourself and increase your awareness, taking the journey from dependent to autonomous.

International

Knowmads develop skills to effectively navigate a chaotic and unpredictable world, not only from the safety of their home, but wherever and whenever. Therefore an important part of the education is to temporarily relocate and try out new things and different cultural contexts. Hence, after their first year, – for a period of three months – students have the possibility to go abroad and work on international projects as one and the same team. This part of the education is called International Project Design and can take place in any country and/or continent: Knowmads students decide and set the destination.

Leadership and teamwork

Knowmads have a free curriculum, with some fundamental concepts and methodologies that are taught and used during the year, depending on the projects the students are involved in. Leadership is something that emerges from the group process and collaboration, and is considered a contextual phenomenon (those who emerge as leaders in one context, may not be leaders in another context). Many core activities, including a visit to another country and many client projects are done collaboratively, and also evaluated collaboratively.

Based on our interviews and experiences during visits to KaosPilots as well as Knowmads, we identified the following principles to be especially relevant for reAct:

- Looking outside school: the world as your learning environment;
- Self-organization: allowing students to self-organize and control the learning environment;
- Connect with experts and organizations to enrich the program and add relevance;
- Real project-based learning: adding 'real' to project-based learning;
- Facilitate peer-support, teamwork, conflict resolution and contextual leadership.

3.5 Partner Interviews and Stakeholder Analysis

Early in the process of developing the reAct approach we decided that it should not be created based on theory alone. As important as pedagogical and theoretical soundness would be the involvement of the participants responsible for its implementation. There were two main motivations for this:

First, the heterogeneity of the implementation contexts *and* target groups would require local adaptation. Such local adaptation would require additional efforts from

local educators, which would be more likely if they were involved at an early moment and if they felt part of the project. In order to transfer the 'intellectual ownership' of the reAct approach from the consortium to local partners and educators, local participation was considered necessary. Hence, consistent with the underlying pedagogy, the development of the initial reAct approach was organized in a relatively participatory manner.

Secondly, we strived to prepare an initial approach or framework that would be as appropriate and instructive as possible for each local context and at the same time leave sufficient room for adaptation and local interpretation. In order to appropriate literature findings, we needed to develop an understanding of the local contexts.

To do that, we included a stakeholder analysis (section 3.5.1) *and* conducted partner interviews (section 3.5.2) as well as invited them to collaborate on the final document.

3.5.1 Stakeholder Analysis

At an early stage of the development of the reAct approach a stakeholder analysis was executed with the aim to identify the profiles, needs, problems, expectations, and assumptions of the target group, which would result in valuable information for the development of the reAct approach and to support work package leaders and local implementation partners.

The implementation partners (also referred to as 'local partner') consisted of 7 organizations settled in 6 countries, including: SERVEF (Servicio Valenciano de Empleo y Formación) from Spain, KEK KRONOS (ΚΕΚ ΚΡΟΝΟΣ ΕΠΕ) from Greece, TR2000 (Training 2000) from Italy, TiBS (Tiroler Bildungsservice) and BFI (Tirol Bildungs GmbH) from Austria, and CNO ESDICA (Centro Novas Oportunidades D. Inês de Castro-Alcobaça) from Portugal. The seventh partner being TUDelft (Delft University of Technology) from Netherlands.

This section contains a summary of this analysis and helps us to further frame the initial reAct approach. Local project partners conducted the interviews with students, teacher and managers in relevant non-formal institutes in anticipation of participating in the project, and reported the results. The rationale was to frame the approach within the contexts of the educational institutions that will participate, and respect their characteristics, needs and technological and budgetary situations.

It was agreed between partners to employ a qualitative method for this exploration WP1, as this was considered to be better adapted to the phenomena studied, since much of the most important data focuses on intangible and subjective aspects in which questioning needs to be exploratory, aiming to uncover the attitudes that underlie the learners situations. For the same reason it was also agreed that a semi-structured interview would be the most suitable data collection tool. All partners

contributed to the final version of the interview script, which can be found under Appendix I. The topics addressed included the following:

- Students (also called 'participants'): socio-economic context, professional background, educational experience, learning barriers, ways to reduce those barriers, motivation to participate in current courses, ICT-knowledge and access to ICT and internet
- Trainers and Management staff: professional background, educational background, experience with target group, ICT-knowledge, access to ICT and Internet, experience with e-learning tools, working environment needed to implement e-learning tools and possible restrictions.

All the partners carried out the interviews in February 2011 and took place in rural as well as city contexts. Participation in the study was voluntary and all the subjects interviewed signed -before starting- a confidentiality agreement in order to ensure the protection of the data obtained and the participants' right to privacy. The interviews were recorded for the purpose of subsequent analysis. Two professionals took part in each interview, one conducting the interview and the other taking notes.

The partners considered the interview process to have been useful, since it provided a clear idea of the situation in the different target contexts that gives a solid basis for the work in the next work packages. The information obtained was rich and most subjects were participative and showed considerable interest in the aims of the project.

Based on the partner interviews, the profile of the typical beneficiary of this program was a person between 17 and 20 years old, who had left the formal education system without a qualification due to a combination of personal, social and institutional reasons. Some participants described their experience at primary school as satisfactory but secondary school as difficult, with some problems. For example, Italian, Austrian and Portuguese participants mentioned learning barriers such as language deficits and lack of concentration in difficult subjects. The reported reasons for student disengagement by Spanish and Austrian participants were bad temper, laziness and low interest in the content offered at school. Greek, Austrian and Portuguese participants mentioned different school and family difficulties: family pressure to get a job and bad communication between teachers and learners. Finally, three social context barriers emerged in Greece, Italy and Portugal: economic reasons, overcrowded classrooms and a generational gap. School experiences ranged from mildly negative to experiences "full of failures". Specific problems mentioned included language and reading deficits, the relationship with teachers, basic cultural issues and the large number of students per class (around 30 in most cases).

In general, the interviews sketched an image of an individual who felt that school was not connected with the real world and did not meet expectations either in terms of preparation for work or at the level of human relations. Despite rejecting these previous school experiences, their need to gain economic independence has led them to enroll in vocational programs designed to develop a skill (usually certified) to help them find a job.

Interviewed students were quite clear about their 'ideal' school environment, and expected the program to be creative, realistic, collaborative, flexible, informal, entertaining, and focused on real work needs. Their ideal trainer would be enthusiastic and engaged. In particular, suggestions were made with regard to the 'interaction' dimension:

- Improving their relationship with their teachers in the program to develop confidence;
- Closer relationships with their classmates;
- More support from family and friends in the training process.

The interviewed students were motivated primarily extrinsically: finding a job or employment or achieving a certificate. None of the interviewed students in Early School Leaver programs demonstrated an interest in the program itself, but in finding a job, because of their families' limited economic possibilities. Spanish and Greek participants wanted to find a job. In the same way, Austrian and Portuguese participants highlighted the need for a certificate.

Most interviewees reported acceptable relationships with their families although in many cases the perception was of weak support and a lack of communication. Most of them were living with their parents and some had more than five siblings. Some of them were in limited economic circumstances, and most interviewees had experienced stressful events in the past such as bereavement (loss of a parent), teenage pregnancy, divorce and forced migration.

The students from Portugal and Greece students reported to have professional experiences, which were predominantly low skilled and temporary. The participants described a wide range of interests such as music, dance, cinema, soccer, cycling, animals, fishing, plants, and mechanics.

Nearly all interviewed trainers and managers were in the possession of a university degree (and some cases even a Ph.D.), prior educational experiences and many had professional or industrial experience. The average age was high (around 40-50 years, except Portuguese trainers whose average age was around 33 years). Many of them had significant experience with young people who had left the educational system at a young age. They emphasized commitment and support from trainers, families and institutions as a key element for such students and underlined the importance of principles such as creativity, positive feedback and interdependence, exploration, and openness to share ideas and problems.

They also revealed high expectations of the possibilities of new technologies, but also a range of concerns about their own lack of training and the constraints of their institutional context. The technologies selected for use with the methodology developed in the project had to be easy to use for all participants, and free. The need for a training program was expressed to help the teachers and trainers to master the basic principles and the technology, both its pedagogical uses and the benefits.

Since the profiles of participants and institutions were different in each country, it was considered necessary to allow for diversification and adaptation of activities and learning goals to each situation based on a common implementation design (summarized in section 3.6.3).

The interviewed managers highlighted a number of potential restrictions and issues related with the implementation of new approaches. Time, schedules, many classes, lack of funds and lack of trainers' engagement were the main problems raised during the interviews. They argued for an approach or program that involves no extra cost, is easy to manage, does not enter into conflict with the center's educational approach and that is convincing for both managers and trainers.

3.5.2 Partner Interviews and Co-creation

The second step was to involve the local partners in the actual development of the initial framework. The methodology has then been drafted collaboratively in several stages of creation and resulted in the 'ReAct Methodological Approach Guidelines' (reAct, 2011a). This was done through interviews and the co-creation of the initial approach using the collaborative editing possibilities within Google Drive, see Table 6. The partner interviews (Appendix II) were semi-structured and addressed the following issues:

1) Description of the course planned
2) Description of the target group (students and teachers)
3) Ideas and suggestions for the pedagogical approach and guidelines
4) Ideas and requirements for the technologies used
5) Teacher training possibilities and plans
6) Data collection possibilities

Table 6 – Partner Interviews and Co-creation of initial framework

April 7th and 8th	TUD: Phone interviews/Skype with partners. - Overview planned experimental courses in September, target groups, size of groups, pedagogical requirements, tools and platforms
April 21st	TUD: First Draft of suggested methodologies, tools and platforms uploaded on Google Drive. Partners: Review document on 'Pedagogy and related ICT tools' and add

	comments, make corrections and suggestions.
May 3rd, 4th, 5th	TUD: Phone interviews/Skype with partners on written comments. - Adapted document 'Pedagogy and Related ICT Tools'
May 9th	All: 4th Online Meeting - Group discussion on the adapted document - Reviewed document online before May 9th

The outcomes of the partner interviews and their suggestions were used during the development of the reAct approach, and relevant information about each implementation context and the participants were further included in the case studies, and will not be included here.

The partners emphasized that trust between teachers and students would be essential, and expressed a desire to develop an approach that would foster better, more personal relationships between the participants. In addition, the social dynamics in the classroom, the atmosphere, and the relationship between peers were considered important features that should be taken into account. It was suggested that collaboration played a central part in the approach, even across borders. The content of the activities needed to be relevant to students and their professional ambitions. Furthermore, the approach should consider involvement of family and friends, such that the social environment could even promote the implementation, rather than turn into an obstacle. Teacher training was also considered essential.

There was much interest in the use of ICT, and many partners expected that the use of ICT, in itself, would be engaging and stimulating. Interest was expressed in the use of ICT to support collaborative and creative activities, social networking, and serious gaming/game-based learning. The tools had to be free to use, and take into account the limited language skills possessed by most teachers and students, and a preference for visual tools was expressed or tools with extensive language-localization options. The tools needed to be usable from a browser by anyone with limited ICT skills.

ReAct had to be useful under different conditions and in different contexts. Students differed in age and (professional) experience, as well as cultural and family background. The pedagogical proficiency and teaching experience (with respect to the target group) also differed. The conditions were also different, as will become clear in the case descriptions, with – in general – limited funds, time, and money to support implementation. A *lightweight* approach was deemed necessary for acceptance. The approach would have to focus on:

- Self-confidence and self-efficacy – most had 'failed' high school and were not confident.
- Social and academic belonging, safety, trust, personal attention, positive relationships between participants (students, teachers).
- Social situation: Acknowledging situation at home - many had weak family support.
- Motivation: all students were extrinsically driven (employment or a diploma), and none were intrinsically driven.

- Language: varying language skills, relatively high number of migrant youth, preference for visual tools.
- Differences in age and experiences has to be accounted for.
- High interest in use of ICT, to foster creativity, collaboration, exploratory learning.
- Challenging institutional conditions: limited funds, time, and expertise available to support implementation.
- Teacher training (taking into account the limited support possible) focused on pedagogy and ICT skills.

3.6 The Initial reAct Framework

3.6.1 Summary of the Chapter

Before we start constructing the reAct framework, we shortly summarize this chapter, starting with its objective. The objective of the chapter was to demonstrate and explain the foundations of the reAct framework. Its main objective was to answer the second research question, which was **"What principles constitute a pedagogy to engage at-risk youth?"**. In addition to the pedagogical design principles, we wanted to propose an implementation design and evaluation framework.

We addressed these objectives from three directions: both theory and practice were covered by a literature review on relevant topics and two exemplary initiatives were investigated. In addition, we collaborated with our project partners to conduct a thorough stakeholders analysis. The results were combined and compared resulting in the initial reAct framework.

I. Literature review

First, we provided and elaborated on different educational beliefs and paradigms, and argued that we are moving towards a more complex, and less predictable society that needs intrinsically motivated lifelong learners who are able to adapt to changing social and economic conditions. Then, it describes how, in 'modern' societies, education is hierarchically organized using extrinsic incentives integrated in test-based accountability schemes and policies. Paradoxically, such schemes, with its explicit focus on rewards and punishments based on quantified metrics of performance, often result in perverse behaviors and effects that run counter to the interests and contemporary beliefs identified in the preceding section. In the context of our study, these consequences are significant, as they include student disengagement, especially among disadvantaged students and those belonging to minority groups, leading to increased social and educational disparity, reduced teacher morale, less diverse curricula and pedagogy, and superficial learning. Minority groups, language learners, and disadvantaged students are particularly affected by these policies. More principle objections to these strict quantitative accountability practices have also been discussed, leading to the conclusion that

reAct should attempt to create conditions that promote trust and autonomy of teachers and learners to foster an open and exploratory attitude towards society.

The second part of the literature analysis focused primarily on the learning process itself in the context of a changing environment and society, with a particular focus on the use of technology. We put the concept of lifelong learning in the context of reAct, and decided to focus on two generic goals, which are 'Learning to Be' and 'Learning to Live Together'. Relevant principles underlying these goals were discussed. Contemporary learning theories and pedagogies were included to further establish criteria and principles for reAct.

The third theoretical part was a literature review on motivation and engagement, which resulted in a significant number of relevant principles. The table below provides an overview of these principles and outcomes, including a selection of the most important sources per section.

Table 7 - Literature review and principles for reAct

§ 3.1.1 – Schools as 'pattern maintenance institution'	(Betts, 1992; Bourdieu, 1998; Illich, 1971; Tuomi, 2007; Williamson, 2013)
Traditional approaches do not appropriately prepare kids for change and a complex society. Relationship between democratic values and the comprehensiveness and quality of education has been described. The risks associated with a narrow, instrumental look on education are highlighted. Principles: autonomy, trust, fostering initiative and self-organization	
§ 3.1.2-3.1.5 – NCLB; How numbers miss the point: standardized testing and accountability narrow perspective on learning and education and lead to disengagement.	(Darling-Hammond, 2007; Elmore, 2003; Giroux & Schmidt, 2004; Hout & Elliott, 2011; Kohn, 2000; Lee, 2008; Mausethagen, 2013; McMillian, 2003; J. E. Ryan, 2004; Steele & Aronson, 1995)
Elaborate description about the conditions and incentives in formal education that lead to disengagement, risking especially vulnerable kids, for example due to phenomena such as stereotype threat. Need for a systemic change towards a system based on trust. Teacher autonomy needed and focus on personalized approach, improving relationship between teachers and learners. Focus on intrinsic motivation and formative assessment, no grading or summative assessment. Curriculum and activities are 'negotiated' by teacher/students. Towards a 'participatory' educational system. Principles: trust, autonomy, self-guidance, formative assessment, teaching as negotiation process.	
§ 3.2.1 – Framing and defining the learning process	(Illeris, 2003, 2007)
Defining learning as a process that constitutes a content, motivation, and interaction element.	
§ 3.2.2 – The concept of lifelong	(Benkler, 2006; Carneiro, 2015; Manuel Castells, 2005;

learning in a networked society	EC, 2001, 2012a; Gordon et al., 2009; Nan-Zhao, 2006; OECD, 2004; Redecker et al., 2011; Voogt & Roblin, 2010)
Comprehensive overview of literature and policies that relate with 'lifelong learning'. Two high-level goals were determined, based on the characteristics of our target group and the goals of the project. These were i) 'Learning to be', implying a focus on self and self-fulfillment, and ii) 'Learning to Live Together', implying a focus on international and inter-cultural exchange between participants. Principles: see below.	
Learning to be: a focus on identity.	(Antikainen, 1998; G. L. Cohen & Sherman, 2014; Delors, 2013; Gewirth, 1999; Pohl & Walther, 2007; Ross & Gray, 2005)
Learning to be means to focus on self-fulfillment and exploring his or her identity. An essential element in this process is decision-making and reflection on the learning process and on society, and balancing personal goals and aspirations with opportunities and demands from society. Equity has been discussed in relation with agency (making choices) and structure (available choices). Principles: Personal project, personal interests and values (self-affirmation), decision-making, biographicity, creativity, sharing, teaching as negotiation process.	
Learning to live together: international community.	(UNESCO, 1996, 2014)
In the context of a significant European crisis, learning to live together becomes a key area of concern. Principles: international project, facilitating interaction between participants, development of an online community space (also for teachers), fostering collaboration through shared goals and structuring tasks.	
§ 3.2.3 – (Social) constructivism, interaction, and creativity using technology	(Blikstein, 2008; Illich, 1971; Lau, 2006; Rahimi et al., 2013; Vygotsky, 1978)
The 'social' aspect of learning is described in the context of (social) constructivism and other (more recent) theories. A particular focus on the use of technology, and the potential it offers in terms of engagement, creativity, inquiry-based learning, and interaction (all relevant topics for reAct). Principles: Inquiry-based and collaborative learning, balanced teams and effective communication, sharing of interests and accomplishments, ICT skills and information literacy, instrumental use of ICT (PLE, Social Media)	
§ 3.3 – Motivation and engagement theories. (motivation)	(Albert Bandura, 1997; Cambourne, 1995; Cheng & Yeh, 2009; Deci et al., 2001; Irvin et al., 2007; Johnmarshall Reeve, 2008; R. T. Johnson & Johnson, 1994; Kearsley & Shneiderman, 1998; Lepper et al., 1973; T. W. Malone & Lepper, 1987; Maslow, 1943; Newmann et al., 1992; Pohl & Walther, 2007; Rotgans & Schmidt, 2011; Shernoff et al., 2003; Skinner & Belmont, 1993; Taylor & Parsons, 2011; Jon Douglas

	Willms, 2003)
Explaining and integrating the concepts of motivation and engagement. Reviewing the literature of both concepts, and combining similar concepts and categorizing the results. Principles: identity, exploratory and inquiry-based projects (using the Internet), constructive learning environment, trust, belonging, fostering cooperative/collaborative attitudes through shared goals, use of social media, ownership (~ competence and autonomy), relevance, challenge and autonomy support / flow, negotiation of assessment criteria, personal feedback, creativity and use of multi-media tools (i.e. writing, drawing, composing, designing, planning.)	

II. Exemplary initiatives

The third strand of research that led to the initial reAct framework was the investigation of exemplary initiatives and identifying the principles that underpinned their pedagogy. The relevant principles are shown in the table below.

Table 8 - Exemplary initiatives: relevant principles from UrWay and Knowmads

Relevant UrWay principles	Relevant Knowmads principles
• Start from students' interests and then 'negotiate' with students to find relevant content and opportunities. • Online community – 'mediated interaction' can feel safer – interaction between students as well as teachers. Students can start their own community; • Assessment on demand – celebrate achievements, use informal certificates to help students gain confidence; • Positive psychology, positive pressure (in the beginning), fail-free environment to foster trust.	• Authentic learning: the world as your learning environment – connecting with experts and organizations – real projects (with real clients); • Self-organization and peer-support: students are in control of the learning environment, curriculum. Support for conflict resolution, goal-setting, teamwork, leadership.

III. Partner Interviews and Stakeholders Analysis

In addition to the literature review, we conducted a stakeholder analysis to ensure that the initial design would be appropriate to local requirements and ideas, *and* as a strategy to encourage 'local ownership' of the reAct approach. The reflection and involvement of local partners and the stakeholder analysis led to the following recommendations and principles:

- Local adaptation should be possible – leave room for interpretation;
- A focus on self-confidence and self-efficacy – most students had 'failed' high school and had limited confidence with regard to learning;
- A focus on belonging – offering a safe, 'low-pressure' environment where participants felt trusted, personal attention and taking interest in students to create positive relationships between participants (students, teachers);

- A focus on intrinsic motivation – most students were extrinsically driven (prospect on employment or a diploma), and non were intrinsically driven: interest-based projects and self-guidance;
- Personal assessment and assessment for learning;
- Language issues – students had different language skills, relatively high number of migrant youth: a preference for visual tools;
- Students across countries were likely to have different backgrounds and age;
- Much interest in the use of ICT to foster creativity, collaboration, and exploratory learning;
- Teacher training necessary, preferably focused on ICT skills;
- Lightweight approach necessary: limited funds, time, and expertise available to support implementation.

3.6.2 The reAct Pedagogical Design Principles

In order to construct the initial reAct framework, we use the aforementioned conceptualization of learning by Illeris, which describes every learning activity as an acquisition process as well as an interactive process between individual and environment. The acquisition process is the psychological processing, the internalization of the content following internal impulses to do so: it links an incentive dimension with the content dimension. The interaction process takes the notion that all learning is situated, which has significant influence on what is being learned, and how it is learned: it puts the individual in an environment (social and societal). All learning always includes three dimensions – the cognitive dimension of knowledge and skills, the emotional dimension of feelings and motivation and the social dimension of communication and cooperation – all of which are embedded in a societally situated context (Illeris, 2003, 2007).

We have taken the principles that emerged from the literature review, stakeholder analysis, and exemplary initiatives and placed them within these three dimensions, as depicted below.

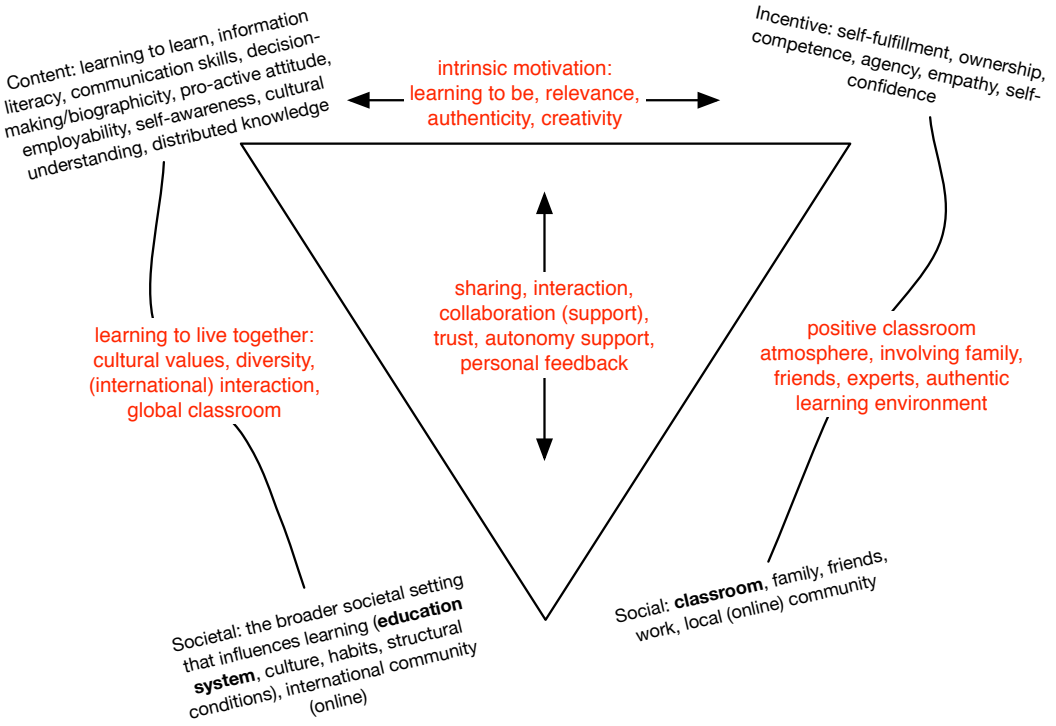

Figure 13 - Principles in the context of Illeris content-incentive-environment dimensions (2007)

The next step we conducted was to further reduce the number of principles into a coherent list that could be easily transferred and understood by local teachers. Similar and related principles were combined into a single principle. In several iterations, through a collaborative process involving all partners, pedagogical principles were selected that were considered most appropriate and effective in addressing the target group. The principles were deliberately described in general terms, such that they left room to the teachers to put them to practice taking into account their local circumstances. To facilitate implementation, an comprehensive and practical report was made (and translated into the local language) for local teachers and partners, which included more context and specific implementation strategies and activities, suggestions, tips, websites, and ideas related with the proposed principles (reAct, 2011a).

The reAct Project strived at piloting and implementing an innovative teaching practice based on trust that can change the traditional ways of second chance or non-formal education, which frequently rely on traditional classroom teaching and content orientation. Technology played a central role as it offers unprecedented opportunities for communication, sharing, resources and tools. After a thorough consultation round with all partners, we concluded on the following initial set of reAct pedagogical design principles (original texts):

1) **Trust**: students and teachers must become confident that their ideas, contributions, and comments are treated with respect, online as well as offline.

Fostering trust engenders self-esteem of the students who have most of the time a poor image of themselves as far as learning is concerned. Teachers should try to create a culture of trust between students as well as among teachers and students. Positive feedback from teachers or coaches is essential in gaining confidence and motivation to go forward. Sometimes, even online mediation can increase trust among participants, because there is equality of participation possible that could develop a free flow of thoughts.

2) **Challenging**: students and teachers get motivated to learn when they experience or are faced with challenging, but manageable assignments. Teachers must ensure learning environments that offer the context in which students can adopt personal or group challenges. Teachers should address topics to study they consider relevant to research. Hence, assignments teacher suggest should be negotiable, or assignments should come from students themselves and teachers should enable students to define the relevance related to the learning goals set out at the beginning of the course.
3) **Self-guidance**: trust implies giving control to students and allowing them to guide their own learning. Within the boundaries and restrictions of each individual pilot, teachers must try to allow as much self-guidance and self-directed learning as possible. This requires not only a different way of thinking, but most important: patience. Sometimes, it takes some time before students get motivated to do 'something'. Asking questions and helping students formulate and improve their learning plans can eventually result in better outcomes than taking back control and providing assignments.
4) **Collaboration**: Students take great interest in working with others. Teachers support collaboration through group-based work and regular feedback moments. Collaborative learning can be organized by harvesting and suggesting issues, challenges or problems to be solved by groups of e.g. four students. These groups will come up with ideas that might differ, and they will have to value all suggestions for the solution to be found. Discussion on these suggestions will help them to think flexibly and foster their divergent thinking skills. By working on a self-chosen goal, they will have to become creative to consider a diversity of choices. They will have to make choices, and making choices collaboratively, will also foster their social skills.
5) **Ownership**: If students (as well as teachers) have the impression that they are in control of the learning they do, there is a sense of ownership. Hence, assignments teacher suggest should be negotiable, or assignments should come from students themselves and teachers should enable students to define the relevance related to the learning goals set out at the beginning of the course. Only then, will learners take responsibility and ownership over their own learning. This fosters both motivation and the development of lifelong learning skills.

6) **Creativity**: through creativity and reflection individuals explore and develop their identity. Creative expressions tell something about someone's capabilities and interests, which is fundamental for maintaining motivation and discovering one's talents. Instilling creativity in the classroom is a crucial factor in developing a person's mind and works best when students feel no inhibitions and are free to form their own ideas based on practical experience and theoretical knowledge. The responsibility of ensuring the development and promotion of creativity in the classroom lies firmly in the teachers' hands. Rather than teaching students how to 'borrow' information from open sources, the teacher should encourage students to own ideas that are created within their own head. The whole point of education and motivation in the classroom is to enable a person to think for herself with the pool of knowledge at her disposal. Classrooms should be fun learning centers, where the most important quality required is freedom of expression. By encouraging creativity in the classroom, a teacher is ensuring that the student has the ability to analyze a problem and think for herself, and is not swayed by orthodox and conventional rules. By promoting free speech, the students are more capable of expressing their thoughts and views regarding any anomalies.
7) **Relevance**: ownership of learning also means defining those topics that the learner finds relevant in life, even though this is not part of the official curriculum. Teachers should, as far is possible, allow students to define the topics they want to learn, research, do. This means that they are allowed to do a project about anything they are passionate about, whether it is Cristiano Ronaldo, learning Spanish, or bio-informatics. The main objective for teacher is to add relevance and to foster curiosity about the topics they want to be covered. Sugata Mitra demonstrated that with no or only limited guidance, students can learn (Mitra & Dangwal, 2010).
8) **ICT enabled**: The role of ICT is critical but not an aim in itself. Using ICT is not about using tools, but about a different, and better way of learning. Technology appear to bring added value for learning through extended and easy access to (a) resources, (b) information retrieval tools (c) sharing knowledge (d) communication tools, and (e) designing or creating multimedia content. Technology enhances and changes learning by the fact that it introduces a new form of knowledge and a pedagogy based on the idea that knowledge is distributed across a network of connections and that learning consists of the ability to construct and traverse those networks. Students can create a personal

learning environment using various, free to use tools that allow learning, creativity, sharing, and communication among other things. The reAct Project provides a dynamic list of tools that teachers and students can use and complement.[14]

3.6.3 Implementation Design

As a practical guide and to ensure comparability of the cases, we developed and proposed a set of suggestions for the teaching and learning methods adopted by teachers, as well as an implementation guide that describes the various phases in the project (reAct, 2011a). The report addresses i) student engagement and motivation; ii) collaboration and group activities; iii) use of technology; iv) communication and media; v) professional development of teachers; and vi) flexibility of pedagogical and organizational design. Because the practical suggestions repeat what has been said already in this chapter, we refer to the Work Package 2 report (reAct, 2011a), which is also available on the reAct website[15]. Below, we include the suggested implementation approach that was based on the following assumptions:

- Teachers will only change their teaching practice if they have ownership on their activities, which meant that partners should collaborate with participating teachers and make plans *with* them, not just *for* them.
- Teachers will only change their teaching practice if they feel confident about the methods used, resulting in a step-by-step approach and the need for a teacher training.
- Specific activities were not supposed to hinder the main program and, wherever possible, support them. This resulted in the notion that activities should be planned concurrently with the planning of the regular program.

Two pilots were organized in each of the partner countries, twelve in total. Both pilots followed the same sequence, and only minor adaptations to the general approach were made between the pilots. Local changes were allowed as long as they were clearly described in the country reports.

The proposed phases were as follows:

Teacher training. In the contexts the project will work in, there will be trainers who have come to training after a career in a particular trade to teach the skills of this

[14] The list of tools is available on Diigo - https://groups.diigo.com/group/react-project - and as a report (reAct, 2011b)
[15] All public documents can be found here: http://www.reactproject.eu/documents-en/

trade, which is very common in VET in Europe (CEDEFOP, 2007). This group often lacks formal pedagogical training and has limited knowledge of using ICT in education, relying on their experience of apprenticeship and school as the basis for their teaching. It meant that for this new approach to be successful it was necessary to educate the teachers in the pedagogical principles and technologies that underlie the approach. Another choice was to add emphasis of the evaluation during the second pilot on the teacher, his or her role in the process, experiences, and impact on the teaching practice. It was suggested that teachers received a pre-pilot training between 10 and 35 hours, depending on possibilities and needs in each context. Subsequently, each of the partner was responsible for developing the teacher training, which all have been discussed separately in each of the cases. Appendix XI contains an example teacher training from Spain. A range of supporting documentation (including the toolset, specific activities, etc.) were furthermore distributed to all participating teachers (reAct, 2011a).

Familiarization. Each pilot started with a 2 weeks program (familiarization) during which teachers worked with students on students' interest, their ambitions, goals, and dreams and prepare for the next 6 months period. The idea behind the familiarization phase was let the students 'experience' the process of taking the lead in defining what and how they would like to learn, to learn more about tools they would like to use for their project. Teachers had to listen and read online discussions to better understand the students' interests and work out plans for how to integrate the students' activities, skills and interest in the program to be taught afterwards. In the first pilot, we asked MIX Academy students and teachers (the Netherlands) to assume a leading/supporting role, which would imply demonstrating various tools and activities for creative expression and describing their class activities in a closed group environment of Facebook.

International Project. Following the EU's objective to foster interaction between peoples from different Member states, and based on the ideas underlying 'Learning to Live Together' (Martins, 2008), an essential element in the approach was the 'international project'. The suggested approach is shown in Appendix XII.

Local project. Similar to the international project, but local. Students were asked to propose a project idea, or continue with the project they had started during the international project phase. They were encouraged to collaborate and interact with each other. The main difference was that from here on, some kind of 'integration' into the regular program had to take place. For example, the projects could be more strongly related to the subject area of the training action. The final products (projects) had to be presented to other participants by the end of the phase.

Final integration. In this phase the activity was supposed to turn to the principal activity of the program, taking into account the experiences and new skills and knowledge about new tools acquired during the previous phases. The aspiration was

that the final integration phase would demonstrate novel activities with respect to learner motivation as well as meta-cognitive and critical thinking skills.

As can be seen, less strict suggestions were made with regard to the final two phases, to allow for local integration and the adoption of specific elements in the approach that were specifically useful for the local context. The implementation design further included several documents, exemplary activities, further explanations about various meta-cognitive skills and motivation-related didactics, all translated into the local language of each partner (reAct, 2011a).

3.6.4 Evaluation Framework

A structured and comprehensive evaluation framework was made for all partners with the objective of collecting comparable data about the implementation of reAct. Because we have discussed the instruments used and data collected in the previous chapter, section 2.2, we will not repeat it here. The illustration below represents the 'evaluation plan' that was developed in collaboration with the partners. In addition to specifications of the instruments and data collection protocols (in particular for interviews), the plan included a clear planning when data had to be collected. The specific instruments were described in the previous chapter and appendices, Table 4, page 32. The partner evaluation activities resulted in a country-specific pilot report, which were summarized in a pilot implementation report. Templates were prepared for the country-specific and overall pilot implementation reports[16]. The diagram in Figure 14 was provided to all partners to visualize the various instruments and data sources to be used to establish pilot reports (T and S refer to *Teacher-data* and *Student-data* respectively; FB refers to *Facebook data*; Artifacts represent projects, presentations, and other student artifacts as well as shared teaching activities).

[16] The pilot report structure, established before the pilots took place, is not the same as the Case Study structure. In the second chapter, we explained in detail how the case study structure was established after the project. The implementation reports can be found at http://www.reactproject.eu/documents-en/

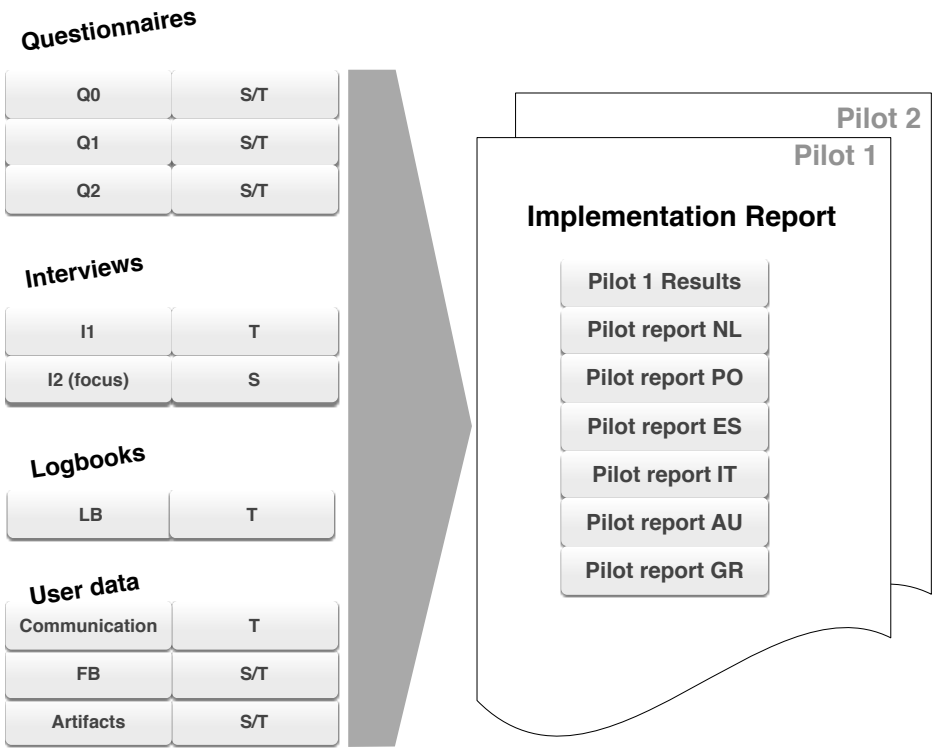

Figure 14 - Evaluation instruments and plan for partners

The following chapter describes the implementation of the reAct framework in different educational contexts.

4 THE CASE STUDIES

This chapter concisely describes all reAct case studies. Combined with the chapter 5 (cross-case comparison), it answers the third operational research question **"How were these principles applied in different educational contexts?"**

Each of the case studies is independently readable and each case offers a unique perspective on the application of the reAct framework in a particular context. Practitioners or interested researchers can compare the contexts (in chapter 5.1) and decide which case to read in more detail. A high-level overview of the different contexts is given in the table below. The table also shows the abbreviations we used to refer to a particular case study.

Table 9 – High-level overview of cases

Abbr.	Case context description
PO	**Portugal.** ReAct was integrated into an adult training program for young adults (aged 18-25 years) who had failed their final year of high school. The curriculum corresponded with the high school curriculum. The students did not belong to any specific disadvantaged group. ReAct was, in contrast to most other pilots, fully integrated into the regular curriculum.
SP1	**Spain P1.** ReAct was introduced as a newly designed course in the context of a VET (Vocational Education and Training) course that integrated education and employment opportunities. Participants were between 18 and 24 years old. Results were positive. The case describes a number of significant implementation challenges as well as successful interventions.
SP2	**Spain P2.** The second Spanish pilot took place within a VET workshop program in a school outside Valencia. Similar to the Portuguese pilot, reAct was organized as a completely new course. Students were unschooled youngsters between 17 and 24 years old. Teachers in this pilot were able to engage students and sustain the engagement throughout the pilot. Teacher autonomy, strong partner support, a dedicated and flexible team of teachers, and other factors contributed to the

	promising results in short- and long-term results.
IT	**Italia.** The Italian case study describes the implementation of reAct in a formal highschool environment with highschool students, which seemed to have a significant impact on how it was organized, participation and, ultimately, impact.
GR	**Greece.** In contrast, the conditions for reAct were more favorable in Greece, where it was implemented in two training courses (Tourism and Economics) for young adults without formal educational qualifications (dropouts). Despite initial resistance, reAct was introduced very effectively and had significant positive impacts on participating students and teachers.
AU	**Austria.** Again, in contrast to the Greek case, the Austria pilots took place within a highly regulated and formal training environment, which was reflected in the pedagogical decisions and focus on curriculum topics. Results were mixed.
NL1	**The Netherlands P1.** The first pilot in the Netherlands was different from the other pilots in the sense that it was not aimed at 'implementing reAct'; rather, it was aimed to describe and learn from the approach developed at the institute, which was an inspiration during the development of reAct. As such, the case demonstrates the limits and potential of a self-organizing learning environment that encourages students, to a significant degree, to take ownership of the learning and organization processes.
NL2	**The Netherlands P2.** The last case study concerns the second pilot in the Netherlands, which was conducted with a group of young migrants, enrolled in a newcomer program offered by a regular highschool. With a limited number of hours per week for reAct activities, results here were mixed. More and less successful activities are discussed as well as the conditions that influenced the implementation and outcomes.

The case studies will often use the terms 'project', 'pilot', and 'phase', which could be confusing if one does not know what these terms refer to. Therefore, we have included a simple diagram of the organization of reAct in Figure 15.

Every reAct partner was responsible for the implementation of 'reAct' (or: 'reAct approach') in their country. Implementation happened during an entire school year, starting in September 2011 until July 2012. In each of the countries, two pilots were organized (P1 and P2), and each pilot was organized following the same 'phases'. These phases were (in this sequence): i) Teacher Training, ii) Familiarization, iii) International Project, iv) Local Project, and v) Local Integration. For a more elaborate description of each phase, we refer to the 'Implementation Design' in section 3.6.3.

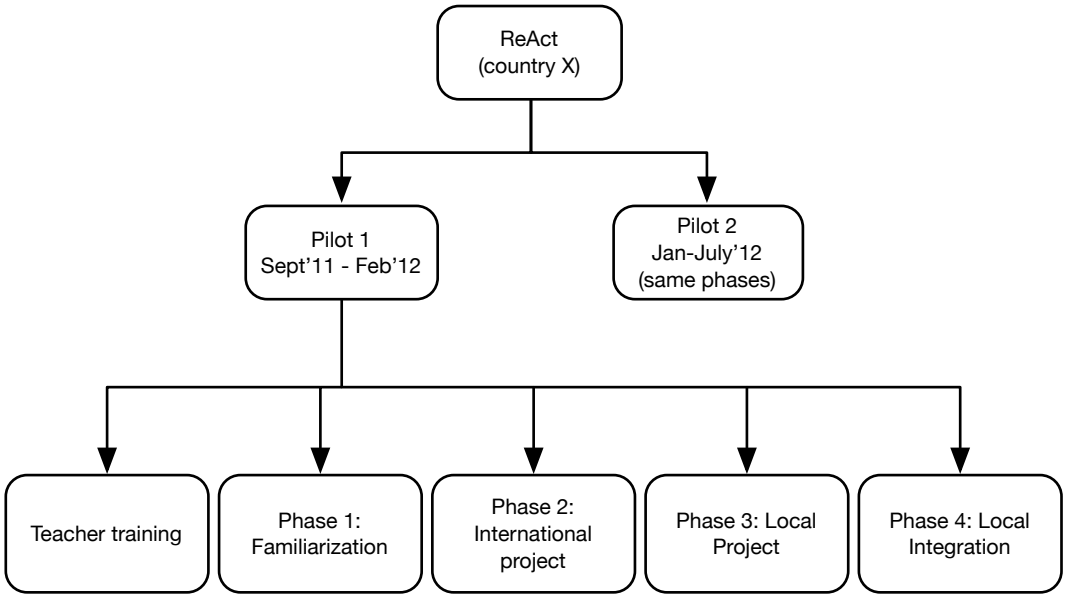

Figure 15 – ReAct Project, Pilots 1 and 2, and Phases per Pilot

4.1 Portugal (PO)

In Portugal, both pilots were conducted at the Secondary School D. Inês de Castro in collaboration with the Center of New Opportunities (CNO) who oversaw the implementation of the reAct methodology. Our local partner was manager at this institute. The following data have been collected and analyzed in the development of this case study:

Table 10 – Data Sources and Instruments (PO)

Data sources & instruments	Description
Interviews	Stakeholders analysis (3 institutes from 3 different regions) – summaries of interviews with 9 students (of which one group interview with 3 students), 5 teachers, and 3 managers – February-March 2011. Pre-pilot 1 preparation and context analysis interview with the partner – 90 minutes on 12 April 2011. Post-pilot 2 evaluation interview transcript – 9 July 2012. 6 Semi-structured interviews (4 individual, and 2 group interviews) with students during P1 – 29 November 2011 7 Semi-structured interviews with 7 teachers reflecting after the second pilot.
Questionnaires	Teacher questionnaires (P2) – pre-during-post • P2 response (6/7/5) Student questionnaire (P1 and P2) – pre-during-post • P1 response (11/11/11) • P2 response (12/12/12)
Artifacts	Several student projects and presentations, wiki page, reported teaching activities.
Teacher log books	P1: 5 teachers filled in one log book – 8 October 2011 P2: 2 teachers filled in one log book – 19 March 2012
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.
Personal notes	The partner used personal notes of (informal) meetings with (other) teachers and managers for the local pilot reports.
Facebook group(s) content (chat, links, discussions)	Facebook content and discussions were used for analysis, including shared videos and links, team formation and new Facebook groups, interaction and activity level.
Internet, websites	Information about the implementation context (including EFA courses and CNO) was found online.
Internal	Basecamp discussions, shared internal documents and emails were

communication and documentation	used as data source.

4.1.1 Context

The Center of New Opportunities (CNO) D. Inês de Castro oversaw the Portuguese pilots. CNOs were part of a national system of recognition, validation, and accreditation, and had the purpose of raising the qualification levels of the Portuguese population, more equality (in particular with regards to gender) and improved access to education. CNOs developed practices, education, and personal support for individuals with problems of integration in the labor market. In general, the framework provisions for CNO programs were relatively open: there were few formal guidelines or restrictions with regard to the educational goals, pedagogy, or curriculum for this group. However, the reAct approach was integrated into an adult training program called EFA (Educação e Formação de Adultos), which was more strictly confined to specific educational goals. EFA targeted students who failed to obtain their high school degree and were aimed to help them obtain an official highschool certificate.

For adult learners, three certified tracks (EFA) were offered, which depended on their highest level of education. The courses EFA-A, EFA-B, or EFA-C, lasted 15, 10 or 5 months respectively, corresponding to 9th, 10th, and 11th grade. The curriculum was based on the regular curriculum, which consisted of three parts: I. Culture, Language, and Communication, II. Society, Technology, and Science, and III. Citizenship and Professionalism. Students had to complete all parts successfully to be eligible for a certification.

During the first pilot evaluation activities were conducted on 11 EFA-C students were, who were part of a larger cohort that included other EFA levels as well. ReAct was implemented with the entire cohort, but only EFA-C students were asked to participate in the evaluation. The second pilot was conducted with a group of 14 EFA-C students. All students were between 18 and 25 years old and had failed their final year (11th grade). If they completed this 5-month course successfully, their certification would enable them to enter higher education (even university). The students had limited self-confidence with regard to their learning skills. According to the partner, EFA courses generally did not address issues of motivation or engagement. The objective of the reAct project, in this context, to engage students into activities that would help them grow confidence, to empower them with new learning skills, broaden their perspective on learning, and to prepare them for lifelong learning. The students did not belong to any specific disadvantaged group or social class. Students indicated to use ICT on a daily basis, mostly for entertainment and communication (email and social networking).

The first pilot was conducted with seven teachers in the age between 35 and 55 years with limited experience in student-centered learning approaches. Three of

them were to some extent acquainted with ICT, but none of them used ICT in the classroom. In fact, their predisposition about ICT in the classroom was generally negative. The second pilot was conducted with the same teachers of the first pilot. Only one of the teachers was unable to continue with it. The classes were all at night, and most of the students worked during the day.

4.1.2 Organizational Level

Pilots 1 and 2 were both done by the same team of teachers. The teacher training, which was formally accredited, consisted of five sessions (in total: 25 hours) addressing the following: i) Introduction to the reAct principles and discussions about the role of the teacher, ii) Project management and discussions about how to facilitate student projects, iii) ICT and the use of web-tools to enhance learning and teaching, iv) Active session involving the ICT tools (such as creating a Facebook account, using Google Drive and other tools), v) Reflecting on the sessions and preparing for the upcoming phases (with students). Also, teachers were introduced to the logbooks and other research instruments that were to be used during the pilot. During the sessions, teachers were encouraged (by the manager/partner) to work together, with the intention of promoting teamwork during the pilots.

The teacher training before pilot 2 was more reflective, and focused on preparing new activities for the new group of students. During both pilots, there was strong support and involvement of the project partner, who gave administrative and organizational support as well as didactic support.

ReAct was organized as a newly designed EFA course, but based on the regular curriculum. As much as 18 hours per week were spent on reAct, which was 100% of the time allocated for the course.

4.1.3 Pedagogical Level

Familiarization. After the teacher training period followed the familiarization phase. At the beginning of both pilots, students received an introduction of the reAct project by both the director of CNO, and the research partner (also employed by the CNO). Students were introduced to the basic toolset and made clear that it was up to them to decide about their own (collaborative) projects *and* their responsibility to execute it. Involvement of the teachers was low during the first familiarization phase, in part due to their limited ICT experience.

The novelty of the new EFA course and its international status made students feel special as well. Students enjoyed the idea of being part of something bigger. The collaborative exploration of ICT tools had a positive effect on the relationship between teachers and learners. Students became more confident with new ICT tools, and the more experienced students helped out teachers with ICT issues, which was clearly motivating to both teachers and learners.

International project. At the start of the International Project phase, agreements were made between teachers and students about the process and products, the student role was discussed and it was emphasized that it was their responsibility to propose a project, find collaborators, and present their results at the end of the phase. The teachers explained techniques for effective group communication to students, and helped them put those into practice in their International projects. At the end of the project, students were asked to present their products using the online conferencing tool Google Hangouts.

The group formation was not successful, due to the language barrier, a lack of proactivity of students, lack of support from teachers, the lack of clarity of the group formation process, and the different time schedules (these cohorts were the only cohorts following classes at night). Despite that, students were very engaged, because they were able to choose their own topic and tell others about it. The final presentation sessions also significantly boosted students' engagement.

Local project. The local project phase was a continuation of the international project, but there was less emphasis on connecting with others through Facebook, and more on local connections and collaboration. Students were allowed to focus solely on their own personal projects, but were asked to align their projects with one of the three core EFA domains: I. Culture, Language, and Communication, II. Society, Technology, and Science, and III. Citizenship and Professionalism. Students proposed and researched their topics using various ICT tools and hardware (such as photocameras and sound recording devices), and developed artifacts that represented their interests. Many of the projects addressed social issues, with topics such as globalization, handicapped people in sports, multi-culturalism and the European Union, and social inequality (see Figure 16).

The local projects focused on curricular topics, while at the same time leaving considerable autonomy to students in terms of output and process. Students' perceived relevance of the course increased during this phase, in both pilots. The topics proposed by students indicated that they were interested in social issues, such as diversity and social equity. Because the work was coordinated locally and communication happened in the native language, collaboration and project management was much smoother.

Figure 16 - Local Project "Social Inequality" (PO)

Final integration. During the final integration phase, the emphasis was on including the ICT tools as an integrated aspect of the didactic approach and, of course, on preparing students

for the final exams. There was a deliberate attempt by teachers to integrate reAct principles as much as possible in their learning activities. An interesting example was the *"Build your house!"* assignment: the mathematics teacher asked students to be an architect and design their future home (Figure 17). Some of the activities were done by students alone and some, such as the building process, in collaboration. The initial activities included making a design on paper and presenting their designs with other students. Then, they were supposed to calculate the correct parameters for the construction, with the help of the teacher. This was followed by an activity involving the ICT tool Floorplanner, which enabled them to draw up their designs digitally, and to validate their parameters. Finally, they were also asked to prepare prototypes using little cardboard boxes in groups, which resulted in coordination of activities within these groups. The objective of the activity was to have students understand simple mathematical concepts related with geometry. Rather than the regular approach, using textbooks and explanations by the teacher, the teacher first let students develop a personal design to add relevance to and interest in the activity. He integrated (geometric) mathematics in the activity when they were already 'hooked' by the design process.

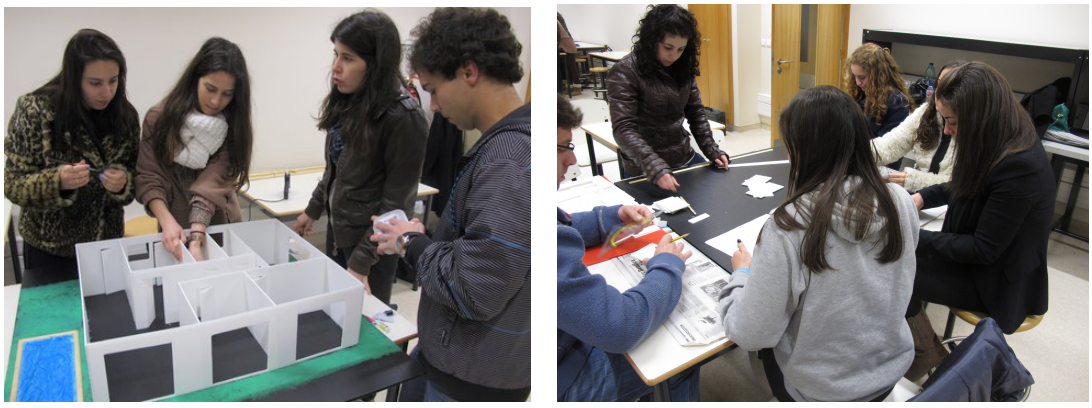

Figure 17 – Build your house! Activity (PO)

The teachers argued that, in order to further embed the approach and reflect on experiences to develop practical guidelines useful for future/other courses, more time was needed. They were all confident and enthusiastic about ICT use, and integrated various tools, including Facebook, in their courses.

The table below summarizes the pedagogical approach at Center of New Opportunities (CNO) D. Inês de Castro.

Table 11 – Pedagogical Principles (PO)

Principle	Description
Collaboration & Interaction	Students were encouraged to find a collaborator to work in teams on their projects, and to share their works online. Teachers supported students in improving communication skills.

	Despite well-outlined proposals for international collaboration by Portuguese students, international collaboration did not take off. It was suggested that group formation should be structured and with a more significant role for teachers. Although there were no International groups, students were happy to share their interests with students from other pilots, and were interested in what they had to share. The effect of this international factor wore down after several weeks, because no deeper interaction emerged from it and students did not consider sharing updates on Facebook a relevant learning activity. Collaborative activities with (local) peers and even with the teachers were considered to be very effective to raise engagement and motivation and at the same time improve the relationship between students and teachers, and among students.
Relevance	For small number of students (3-5 students), the opportunity to choose their own topic, without constraints, was transformative in the sense that they discovered an interest that gave meaning to their lives, and also significantly changed their attitude towards other students, teachers, and even at home. Most students were more pleased during the local project phases, which focused on curricular topics, while at the same time leaving considerable autonomy to students in terms of output and process. In both pilots, students' perceived relevance of the course increased during this phase. Teachers commented that many students were focused too much on the outcomes, rather than on the process, and thought that more time for reflection was necessary. Students were motivated by the fact that they felt 'part of something larger'. The International aspect and broader perspective of the project added meaning and relevance to the project.
Self-guidance	Teachers allowed students to explore their interests, and at the same time, they dedicated much time and effort on helping them explore and research using online sources. There was support for project-management, and frequently, students were reminded to hand in the assignments, or to do specific tasks related with their projects. Students liked the opportunity to choose one's own project, and to some degree, they liked to self-guide their projects. However, it was also considered very challenging, and strong support from teachers was still required. Especially when faced with relatively passive students (in P2), more control by teachers seemed the appropriate approach. It was also suggested that the higher level of control amplified the passive behavior of students, which implies a rather subtle relationship between self-guidance and control. Teachers often considered their role to be part of the team, rather than a teacher. Despite that, students indicated an overall low level of control over their learning activities and content. It seems that the perception of the teachers and students were different with regard to control or autonomy. There was confusion among students about the principle of autonomy. As one teacher put it: *"It is difficult to integrate the REACT project principles at school because students offer much resistance to autonomy in learning because they confuse autonomy with mess"*. Some students became disengaged because they did not realize that self-guiding one's project was so demanding.

Trust	The more personalize approach resulted in improved relationship between the students and the teachers was considered one of primary causes for student engagement. The collaborative exploration of tools during the familiarization phase was very successful: students often helped teachers with getting started with an ICT tool, changing the way teachers and students interacted.

Teachers indicated have some discomfort in allowing students to work autonomously on self-chosen projects, because they were unsure about how to control the process and give appropriate feedback to make sure every student would participate effectively. Assignments were considered to be well structured and clear about its intended results and relevance, which students appreciated. Teachers developed, in collaboration with the students, various self-assessment forms. For example, during familiarization and the international project phases, teachers and students collaboratively developed a self-assessment format addressing communication skills. During the second pilot, this form was improved and extended. Similarly, there were discussions about what it meant to do research, in particular using online sources, and there was practical support and feedback for 'doing projects'. It was suggested that more time for reflective activities would be needed to develop a shared understanding of reAct approach. The topics students were working on during the local and integration phases came from the existing curriculum, and therefore it was easier for teachers to give support and feedback, suggest content, create assignments, and link those to formal assessment criteria. In both pilots, the students participated in the international presentation sessions. At the end of both pilots, students were assessed according to the formal assessment criteria of the EFA program.

Similar to most other pilots, the use of ICT was central in the approach. Students and teachers collaborated in evaluating and using various tools. ICT was used for information management and sharing (Google Search, Drive, Dropbox), social interaction (Facebook, Google Plus and Hangouts), developing creative output, online magazines and presentations (ISSUU, Prezi, Powerpoint, MovieMaker), maintaining a portfolio (Google Sites website maker), and specific tasks, such as designing a house (using Floorplanner).

4.1.4 Results

Teachers, students, and even parents were very positive about the project, except about the organization of the International Project. Specific outcomes regarding engagement and development of skills are discussed in the two sections below.

Engagement

Engagement was reasonably high from the beginning: in both pilots students were very excited by the idea of being able to organize one's own project, and to connect with peers from other countries. Despite failed attempts to connect with other

students, and a lack of response online, students remained engaged during these periods. One 'notoriously bad-mannered' student, known for his negative behavior in class, was clearly affected by international element in the project. His attitude went from being hostile and distrustful into helpful, interested and friendly. This was even picked up by his parents. Another student, when confronted with the opportunity to choose his own subject, discovered a very strong interest in photography. He was able to start exploring this during the pilot, and continued with it after the pilot ended.

During the second pilot, it was reported that the students were less proactive than the first group. This group consisted solely of EFA-C students who would be finished by the end of the semester and, upon successful completion, would receive the much-desired EFA certificate. The P1 cohort was a mixed group consisting of EFA students from different levels, and many were not under pressure to finish by the end of the semester. About one-third of the P2 students estimated to spend a couple of hours per week on reAct, while more than half of them indicated to work at least two or three days per week on reAct related activities. Also, from the P2 students, 75% said they to have been 'sometimes engaged', while only three were fully engaged by the pilot activities. Only few students indicated to work on their projects or reAct related activities at home, which may be explained by the fact that the students had normal day-jobs. Teachers reported no resistance against their proposed activities, and students were generally satisfied with the reAct project.

Teacher participation was high: they took this course as a very serious opportunity to address their students in a different way, and to broaden their perspective and teaching skills. At the start of the first pilot, a few teachers were skeptical, but the positive initial experiences with ICT and the positive feedback they got from students helped transform their initial skepticism about technology and about the presumed students' inability to organize their own work, had turned into conviction and engagement that lasted throughout both reAct pilots and beyond.

Skills and Attitudes

Overall, the students were very positive about their 'reAct experience'. They enjoyed it more than the regular learning experience, and particularly valued the positive interaction with their peers and with teachers.

Teachers reported that many students developed an open attitude towards them and became more self-confident talking in public, asking questions, and giving (ICT) support to teachers and other learners. There were many investigative and collaborative activities that involved information gathering, research, and presenting using ICT tools, which ultimately improved students' digital competences, research and collaboration skills. Students reported improvements in employment skills and communication skills. Teachers were very positive about the students' ability to reflect on the process, and described how they developed a capacity for self-

assessment. Students in the second pilot were less proactive and demonstrated to take less responsibility for successful completion of their projects; they mostly followed instructions and did not go beyond the pre-established structure and assignments.

The effects on teachers, self-reported and reported by students, were similarly promising. Five out of six teachers, at the end of the second pilot, indicated that the project had changed their view on teaching. They explained how the different approach had improved their interaction with students, how it broadened their view on teaching and learning and how their confidence to use ICT had grown, making it an essential part of the teaching for three of them. At least three teachers said that reAct more or less confirmed what they had already been thinking, and that the project offered an opportunity to put into practice some of the ideas they had developed in the past. They were proud to be part of an international project, notwithstanding the fact that interaction with students or teachers from the other pilots was limited. The Portuguese teachers considered interaction with their own students to be more pleasant and on a more equal level. Most teachers started to integrate the use of ICT in their teaching practice from the first pilot onwards, and even more during and after the second pilot. The pilots were experienced as demanding, and the teachers were *'very tired'* at the end of the second pilot.

4.1.5 Conclusions and Reflection

The pilots in Portugal were conducted with strong partner support, engaged teachers, and within an appropriate educational context. The data indicate a relatively successful implementation with positive effects on most students and transformative effects on a few. The following sections address the context, organizational, and pedagogical aspects that may explain the relatively successful implementation.

Context

A number of student-related aspects influenced the effect of the implementation. First of all, students were highly committed to obtaining their certificate. It may explain that some P1 students, and about half of the P2 students, were more focused on activities that directly contributed to (final) exams and certification, and less on activities that contributed less directly to this goal. On the other hand, activities that most affected these students' engagement, had to do with personal exploration of interests, collaboration and a different student-teacher interaction, because, more than formal subject-oriented learning activities, these activities more directly addressed the students' initial lack of confidence.

The engagement and commitment of teachers and the partner (also: manager) was also an important factor that contributed to the implementation of reAct in Portugal. The reAct approach addressed some of their long-held beliefs about education and

they saw this project as an opportunity to experiment with a more student-centered approach. Still, they were unsure about the meaning and implications of the reAct principles.

Organizational level

Despite the *comprehensive teacher training*, and significant efforts by teachers beyond the training (e.g. looking up definitions, discussions), they still felt unsure about application of the principles during the first pilot. More clarity and practical support and guidelines were desired as well as more preparation time.

A successful aspect of the teacher collaboration was the *private Facebook group*. The privacy made them feel safe to talk about students, about their doubts, to *'ask stupid questions'* and to suggest ideas to each other. It was an effective supplement to talking to each other face to face. At the same time, it helped them understand how to communicate in such an online environment, and some of its potentials and limitations, which they then used with their students.

Finally, teachers said that without the strong support of the *local reAct partner* it would have been much less successful. The management actively endorsed and supported the exploration of the reAct approach within the EFA context, and teachers felt motivated because of it. The EFA program itself was also 'ready' for reAct in the sense that it offered sufficient flexibility for students to choose topics they found relevant.

Pedagogical Level

The case demonstrates that self-guidance is difficult to implement. First of all, we saw that there was some confusion about its meaning, and as one teacher put it: *"It is difficult to integrate the REACT project principles at school because students offer much resistance to autonomy in learning because they confuse autonomy with mess"*. Clarity and transparency about intended learning outcomes, and more practical guidelines to facilitate teachers and learners would enable more effective implementation of this approach. Some students became disengaged because they did not realize that self-guiding one's project was so demanding. The data further suggests that the higher level of control in P2 amplified the passive behavior of students, which implies that taking control (by a teacher) reduces the potential for self-guidance and control. On the other hand, the case contains relevant and interesting examples that describe how teachers find an effective balance between structure and autonomy, and which also demonstrate the value of limiting choice for students. The fact that a small number of students had a transformative experience should also not be overlooked. Apparently, their renewed enthusiasm and confidence influenced others in class in a positive way.

The case further demonstrates the importance of creating a collaborative and trusting atmosphere. Students as well as teachers indicated that the two main

success criteria were trust and collaboration. In particular, for students a positive relationship with teachers was the primary driver of engagement.

Role of ICT

Implementing the reAct principles challenged the Portuguese teachers, who instinctively paid more attention to the more practical 'use of ICT'. As one student puts it after the end of the pilot: *"… the objective was achieved, contributing so that we begin to think about how technology affects us, even if we cannot see it. It is always present from the simplest to the most complex, leading us to wonder what the future keeps the level of Information and Communication Technologies."*

It seems that introducing ICT as a means to support a particular approach can be interpreted as a goal in itself, especially if its role is not clearly defined. Despite that, they reported that their experiences with ICT changed their teaching practice in several ways.

They found out how certain ICT tools, notably Facebook, allowed them to communicate with students beyond school hours, know them better, and interact in a different way. Students were motivated to share their updates with peers online. In addition, Facebook groups were used regularly as a tool to support collaborative activities, prepare class, and as a communication tool for teachers and learners.

As in other pilots, the ICT Toolbox was considered overwhelming and too complex to use. Moreover, teachers were concerned about the systematic use of social networks for other, non-educational, purposes. Moreover, teachers sometimes complained about how the Internet caused 'dispersion', meaning that students tended to get lost in the abundance of websites and information available online. In particular, reading and writing exercises were considered more difficult 'when students were connected online'. It was also found that distraction and ineffective use of ICT happened more often among students who already were disengaged and struggling with their projects, while more committed students demonstrated more creative and effective ways to use ICT.

They further recognized that students were challenged by the amount and diversity of information and possibilities online. It was suggested that this was an opportunity for learning, and that there was a clear need for a methodology that would support students with this.

This first case study demonstrated a relatively effective and well-supported pedagogical approach with positive effects on most students and transformative effects on a few. The next case study, pilot 1 in Spain, describes a similar approach, with similar, albeit more positive outcomes.

4.2 Spain – First Pilot (SP1)

In Spain, the pilots were conducted at two different educational contexts and thus described as separate case studies. The first pilot was conducted in Castéllon at the Ceramics institute IES El Caminás, which was located in a rural environment at a distance of 75 km from the city of Valencia. The pilots were done under the supervision of SERVEF, the Spanish partner in the reAct project.

SERVEF (Valencian Employment and Training Service) was a local governmental organization that promoted, developed, and managed national and regional employment policies, -mediation and -counseling. It was responsible for training in the fields of occupational and continuous training and was involved in the design of curricula, programs and methodological materials for vocational training as well as a national vocational qualifications system concerning *professional certificates*. Moreover, the organization participated in, and implemented innovative educational projects with regard to the use of ICT in education.

The following data have been collected and analyzed in the development of this case study:

Table 12 - Data Sources and Instruments (SP1)

Data sources & instruments	Description
Interviews	Semi-structured group interview with 5 students, 90 minutes – 24 January 2012
Questionnaires	Student questionnaire (P2) – pre-during-post • P2 response (14/14/10)
Artifacts & Activities	Several student projects and presentations, wiki page, and several shared teaching activities.
Teacher logbooks	P1: 2 summarized logbooks – 6 October and 20 December 2011
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.
Personal notes	The partner used personal notes of (informal) meetings with (other) teachers and managers for the local pilot reports.
Facebook group(s) content (chat, links,	Facebook content and discussions were used for analysis, including shared videos and links, team formation and new Facebook groups,

discussions)	interaction and activity level.
Internet, websites	Information about the implementation context was found online. In addition, one of the teachers started a website and blogged about her experience with reAct and student projects[17].
Internal communication and documentation	Basecamp discussions, shared internal documents and emails were used as data source.

A case description was submitted to the project partner, who made suggestions to improve the description, including additional materials for evaluation.

4.2.1 Context

ReAct was piloted with students from a specific program of Training and Employment called VET (Vocational Educational Training) Workshop Program, which was part of the Valencia Community program to tackle youth unemployment. At the time, 30% of young adults between 18 and 24 years in the municipality of Valencia was without formal qualification. The VET program was launched in 1999, and has been successful in achieving a permanent job position for the majority of beneficiaries after they finished their training. The program focused on both educational qualification as well as employment opportunities. Participants had the opportunity to obtain a degree in the specialty chosen through a period of theory and professional practice. The program consisted of a six-month (classroom) training period and 18 months of working plus complementary training. During the first phase of the program, students receive a study grant, followed by a contract for the remainder of the program with a salary of 75% of the Spanish minimum wage. The curricula and activities usually addressed socially relevant activities related with art, culture, environmental, and urban issues.

The pilot was implemented at the secondary educational institute 'El Caminàs' in Castellon. The school, founded in 1981, offered regular high school tracks and professional certificate tracks to a variety of students on a variety of topics, including tracks especially for VET students. It had some experience with blended and distance education to those students who were geographically dispersed or unable to attend to the regular lectures.

The pilot was conducted with a group of students following the 'Ceramics' program, with initial, basic, and vocational/professional courses about ceramics, pottery,

[17] The website has been discontinued, but parts of the website can still be reached through the Internet Archive (archive.org). The original URL was http://www.pqpi.es/

glass, and production. The group of participating students, aged between 15 and 17 years old, were labeled as 'dropouts' from a previous program. Most felt stigmatized because of this. There were 13 male students and only one female student. The students participated in the most advanced level of the Ceramics program with the objective to obtain an accredited high school certificate as well as preparing for a professional job. The students were predominantly motivated by the prospect of obtaining a certificate of completion and by the opportunity to gain work experience and increase their employability. Only a few seemed to be primarily interested in ceramics. They showed interest in the International aspect and in using ICT in the classroom.

The participating teachers were chosen by the school's management to be part of the project, so their participation was not entirely voluntary. There were four teachers, aged between 30 and 55. Their impression was that students were just 'incapable of learning' and that they had dropped out of the previous course because of that. The main objective, as defined by the teachers, was to develop learning activities that motivate disengaged students and to help them overcome personal issues and lack of confidence. They were also interested in the approach as a way to foster learning skills and autonomy. Another objective was to become more experienced with the use of ICT in the classroom, in particular to engage students. Any use of ICT was considered a novelty, because the school's ICT policy was highly restrictive (for students).

4.2.2 Organizational Level

A three-day teacher-training program was provided to teachers just before the start of the pilot. In addition, teachers were asked to join a Facebook group where the discussion about the pilot could continue. The teacher-training had a addressed the reAct pedagogical principles but was focused on exploring the ICT Toolbox. During the pilot, the partner offered online, telephone and weekly face-to-face support. The online support happened through Google Hangouts, written guidelines in Google Docs, and a private Facebook group for questions and answers. During the weekly visit the partner had talks with both students and teachers about the progress and any issues that may have surfaced.

A reduced ICT Toolbox, including Spanish descriptions of tools and pedagogical use cases, was prepared for the participants. The selection was mainly based on tools that helped students explore, aggregate, and present their interests online. The local partner also offered support for this smaller selection of tools.

The pilot was embedded as part of the regular Ceramics course, with more time allocated to self-guided and exploratory activities during the initial phases, and more in line with the regular curriculum towards the end of the pilot. The original intention was that half of the time allocated for the course would be spent on reAct activities, which would be approximately 18 hours per week, but in practice this was

not feasible, because teachers felt the need to comply with the regular demands of the program.

4.2.3 Pedagogical Level

Familiarization. Students were given notebooks, for which they had to sign an agreement. They were all asked to install Open Office, the Google Toolbar (for translation), and bookmark the webpages to access the Facebook group and Diigo toolbox. Then, they were introduced to the project, its underlying principles and the international nature of the pilot. Students were asked to translate the reAct principles and discuss their meaning or personal significance (in class). They were also introduced to the international reAct Facebook group, and asked to sign up for it. Each session during the familiarization phase followed the same sequence: discussing the approach, asking students to prepare for a project (picking a topic, choosing a tool), and sharing messages and updates on the Facebook group.

As in the teacher-training, tools were explored collaboratively. Teachers and students discussed (potential) uses of ICT for learning and communication, and improved or added descriptions in Diigo. Many students chose Glogster to develop an online poster with multimedia related with their interests or proposed project. One of the teachers created a blog to communicate with students, and plan activities. For one meeting, students' parents were invited to inform them about their son/daughter's participation in the pilot, but teachers were ineffective in making them enthusiastic about it.

The activities during the familiarization phase, in particular the collaborative exploration and selection of ICT tools, were much appreciated. It also resulted in better tool descriptions, an improved understanding of the potential uses of ICT, and engaged teachers and students.

International project. Following the Glogster activity, students were supposed to propose a project linked to their interests. Their proposals were merged into lists that included the proposals from other pilots and included in the voting procedure. Then, students could show an interest for a proposal with a comment and a vote. Based on votes (by students), projects were chosen to be executed as part of the international project phase. The Spanish students participated in three projects that had no particular relation with the Ceramics course. For example, one of the projects addressed the topic of 'animals abandonment'. Students from another pilot had proposed this topic, and Eli (not her real name), a girl from Romania without family in Spain, chose this topic because she felt connected to the theme. During their participation, she showed remarkable interest and expressed that she felt she was doing something meaningful.

The familiarization and international project activities were experienced as something completely novel. Students appreciated the possibility to explore (and share) personal interests with peers. Also, the international aspect appealed to

them, and they enjoyed sharing their interests and projects online. Students were not embarrassed or inhibited by their lack of English language skills, and were relatively active on the International reAct Facebook group, mostly using Google Translate. Coordination during the international project phase was limited, due to poor English language skills of teachers. In addition, protocols regarding ideation, proposal, and group formation were not clear to all participants, and delays and confusion about dates further exacerbated the complexity of arranging productive international collaborations.

Local project. The local project consisted of an inquiry into the local city's (Castellón) architecture and history. In close collaboration with the teachers, students developed a working plan, criteria to take pictures, shared tasks, and made groups to execute the inquiry.

The local project was easier to coordinate, and was appreciated by all participants. Despite the fact that students were not in charge of the definition of the assignment (it was suggested by the teachers), they did enjoy the autonomy of the execution. In addition, the nature of the activity engaged them, which consisted of going out and making pictures of the town, mapping all kinds of interesting historical artifacts, doing research, collaborating, and discussing the tasks that lay ahead. Without the need for international collaboration and coordination, this was considered a safer and less frustrating experience.

Local integration. The local integration phase consisted of curricular activities and integrated several ICT tools. There were not many 'student projects', rather the teachers developed assignments for students with the inclusion of ICT. Students made manuals, videos, and presentations about the making a ceramic bottle and other objects (part of the curriculum), and shared this with others using the wiki and Facebook, which increased their sense of significance and made students serious about participation. In addition, teachers suggested websites to visit to allow students to learn at their own pace and time. These included websites about relevant health issues, and online educational resources, or simulations. An example is included in Figure 18, showing a website with simple mathematics exercises.

Figure 18 – Online educational resources (SP1)

Students appreciated the new elements introduced in the program, in particular the collaboration with others, and the use of different media and tools to present the work they were doing to the world. Students still enjoyed participation

during this phase, but overall appreciation was lower, due to the more 'instructive approach'.

During teacher training and familiarization phases, there was consistent focus on ICT, and to a lesser degree, on pedagogy and developing pedagogical strategies based on the reAct principles. During the International project phase, teachers offered limited support and showed limited interest for the self-guided activities, due to a combination of lack of understanding, facilitation skills, and the perception that this group of students (dropouts) would not perform well without structure and strong guidance. However, students appreciated the 'more autonomous' activities more than the more structured, teacher-directed activities.

The table below summarizes the pedagogical approach of the pilot.

Table 13 – Pedagogical Principles (SP1)

Principle	Description
Self-guidance	Students were free to choose their topic, learning objectives, tools to be used, and team members during the international project phase. During the other phases, students were much less in control, and activities and assignments were done in a more timely manner. Despite unsuccessful international collaboration, self-chosen projects generated high student engagement and were appreciated as being a valuable and fun experience. Teachers were not used to facilitate self-guidance, and it was considered difficult to 'let students go'.
Relevance	Frequently, students and teachers reflected on the process and content of the activities. Together, they decided that a strong focus on the curriculum was desired, because that was also the main reason these students were there: to obtain a certificate in ceramics. Many activities, except during the International project phase, were directly related with the curriculum and students appeared to appreciate that.
Collaboration & Interaction	Students were very enthusiastic about the international aspect, and most tried to connect to other students and exchange interests and information about a project. Some even remained in contact after the end of the pilot. Students were encouraged to find a team member to work with on their projects, and to share their works online. As described earlier, coordinating (international) collaboration was challenging and the teachers stopped promoting and supporting the activity. Partner instructions, tips, and templates for international activities that were distributed to the teachers were not used. Also, they reduced the time students were able to spend online and chatting with students from the other pilots and argued that the students needed strict guidance. Students appreciated the opportunity to share their ideas for projects and their interests online using the Facebook group. Also, the international presentation excited the students. Finally, the students were eager to tell about their education and explain what they were doing on school. They described how the 'sharing' element made them more serious about the

assignments, because they would be visible to others. Teachers said that sharing also meant that students had to explain what they were doing, which improved their comprehension.
The collaborative exploration of the toolset (by teachers and students) had a reported positive influence on how they interacted and trusted each other.

Students were asked to prepare their works to be published on the teacher's blog, and to make it available to a wider public. For example, the presentation about 'safety at work' was supposed to inform a wider public. Teachers assessed uploaded student projects from the perspective of the educational quality and understanding, but also from a 'communicative quality': how well the message was transferred to the public. Teachers assessed most activities except for the international project activities. At the end of the pilot, students were assessed using regular assessment criteria.

The project had a strong emphasis on getting teachers acquainted with ICT. There was an emphasis on ICT during teacher-training as well as the familiarization phase, and teachers refer to ICT tools in the logbooks. Their understanding of the project was mostly related with the integration of ICT tools, and less with the integration of the pedagogical principles of reAct.

The tools that were explored including Tuenti (a social network site that was – at the time – popular in Spain), Open Office, Glogster (digital multi-media posters), Dipity (visual timelines), PowerPoint and Slideshare (sharing presentations online). To participate in the reAct international project and interact with other students, students created an account on Facebook and joined the international Facebook group. A private teacher space was also created within Facebook for communication between partner and teachers. A teacher managed her own blog during the pilot and was very positive about the experience; it allowed her to more easily distribute homework to students, and to collect and share ideas and websites she came across. She particularly liked it when students left comments.

4.2.4 Results

Results were mixed. Teachers indicated that the effectiveness of the activities were not clear to them, and wondered if students were spending their time effectively. They mostly referred to the international project phase, which was not considered successful.

Engagement

At the start of the pilot, students' expectations and excitement were high. The personalized approach made students feel special and class cohesion improved. There was a very positive response on activities during the familiarization phase, in particular the collaborative exploration of ICT tools. However, activity level and engagement during the International Project dropped. Teachers reported that students were not using their time effectively, were distracted and not using their

time in a productive way. Most of the time was spent on *'doing irrelevant things online'*, such as watching and sharing music videos among each other. In the end, students finished their 'International' projects without much interaction (and no collaboration) with international peers. The local project had a positive effect on students' activity level and engagement, because assignments were clear and considered meaningful. They appreciated that they were involved in the preparation and planning of the project, and were free in the execution of the assignments, which involved going out of school, making pictures, and several collaborative activities. Teachers were effectively able to facilitate the process. The local integration phase consisted mainly of regular curricular activities, which resulted in higher engagement among most of the students, especially when preparing for 'final presentations' and the collaborative local project.

Due to the compulsory aspect of the course, presence and participation level of students during the entire pilot phase was high. The survey response rate was similarly high with 90% of the students filling in the surveys, which also indicates that their engagement level was high throughout the entire pilot. Students rated their experience of the project as positive to very positive, which was significantly higher than average and the highest as compared to other pilot 1 groups.

Teachers, despite the fact that they were assigned to participate in the pilot, responded positively to its objectives and principles. Teachers were engaged throughout the pilot, but had reservations towards the use of ICT and the personal student-projects.

Skills and Attitudes

Students were neutral to positive on the effect of the pilot on their ability to prepare for an internship, and more positive on its effect on their ability to connect and communicate with others. Students felt more confident, because they felt they had accomplished something by themselves, the effect being more visible among students who previously never showed any interest in school. Also, a better and more collaborative atmosphere emerged, which improved the relationship between teachers and students.

Teachers explained how students developed skills related with self-organization, planning, collaboration, and communication. Students lost fear for public speaking, as they exposed their work to their peers, and then openly discussed and evaluated the work together. Furthermore, they developed ICT skills and shared their 'expertise' with teachers (about the use of social networks), which was an uncommon practice. This improved the relationship between teachers and students, and also had a reported positive effect on the class cohesion. Whereas before the pilot started, all students just wanted to have diploma to access the job market, by the end of the pilot at least five students showed interest in continuing education, *'as this seemed no longer as something unreachable or impossible to achieve'*.

Teachers were positive about the reAct principles, and thought that the project-based approach appropriate because it was close to real work situations. They did find it challenging to put into practice. They explained that they felt more confident using ICT, and that they had developed a more diverse teaching approach involving self-guidance, ICT, and collaboration. It was also mentioned that they had learned to restrain themselves from interfering too early.

4.2.5 Conclusions and Reflection

The reAct approach, in this first pilot in Spain, was implemented in a way that satisfied the participants. Its relative success is hard to pinpoint to a single factor, but we can make several interesting conclusions with regard to the educational context, the organization of the pilot, and the pedagogical approach.

Context

ReAct was implemented as part of a program dedicated to tackle youth unemployment, which implies that its objectives were well understood and in line with the formal program objectives, and thus supported by key stakeholders. Together with the partner, they made a concerted effort to make reAct work, most importantly the effort to integrate reAct within an existing course and by giving teachers the freedom and responsibility to explore effective ways to integrate the approach.

On the other hand, the situation was more challenging. The participating students were, according to the teachers, were unable to progress without structure and not 'fit for autonomous work'. Reasons mentioned include their young age (15-17 years), a lack of relevant learning skills as well as the fact that some of the learners had learning disabilities or faced other medical or physical challenges (ADHD and the like).

Organizational Level

The teacher-training was considered insufficient in depth and time and teachers sometimes felt unprepared, in particular with regard to facilitating self-guidance and designing effective project-based and collaborative learning activities using ICT. They felt apprehensive designing and implementing learning activities that covered the full range principles proposed to them. Therefore, their focus was more on the use of ICT (as an objective in itself), rather than on changing the pedagogy. More than once, teachers expressed a need for clear assessment criteria. In general, more time was needed to help teachers prepare effective strategies and activities, to allow students to familiarize with the project's goals and their own responsibilities, related tasks, and supporting tools, and to form groups and project proposals that would help them progress and achieve results.

Pedagogical Level

The significant focus on ICT (rather than pedagogy) during teacher-training and familiarization explains the lack of effective strategies to support students' self-guided (international) projects as well as the limited interest and involvement of teachers during these activities. Interestingly, students strongly appreciated the more self-guided activities, even though it challenged them and despite the fact that teachers were passive and perceived this phase as an ineffective period. It may show that teachers were not aware of what was actually happening, and that the mere process of focusing on, and discussing one's interests may have an intrinsic value, regardless of the visible learning outcomes.

The description of the later phases demonstrates an apparent tension between a need for progress (through structure) and intrinsic motivation and engagement (through self-guided exploration). Although students were progressing and did the assignments 'in a more timely manner', there was less overall appreciation. Still, students expressed a need for better support and more meaningful feedback, which seems to contradict the earlier notion that students appreciated self-guided activities more than structured activities.

Finding the right balance between structure and autonomy appears to be an important challenge for teachers, who generally felt uncertain about this task. They did not know how to give feedback to students about topics they knew little about and were unsure how to guide the ideation phase, preparing proposals, the formation of a team, and the planning and execution of the projects.

Role of ICT

The experiences with the use of ICT were rather positive. First of all, receiving a personal laptop at the beginning sparked students' interest and gave them a sense of being special (in a positive way). Gradually, the notion of a personal learning environment demonstrated its value through new opportunities to (self-)organize learning, interaction between students and teachers, open educational resources, and creative learning opportunities. The reduction of the number of tools available to students and teachers, the descriptions in Spanish and the higher level of support (by the partner and teachers) made using those tools more effective, and teachers felt more secure and were better able to direct their efforts.

The next case describes the second pilot conducted in Spain, which happened in a different educational institute, but in a similar VET training context. Whereas the first pilot touched upon the various benefits of the reAct approach in this context, in the following we will read how teachers were able to explore its potential in more significant ways.

4.3 Spain – Second Pilot (SP2)

The second Spanish pilot, coordinated by SERVEF, was conducted at ET Laurona VI in Llirias as part of a VET (Vocational Education and Training) course. More information about the VET context and our local partner SERVEF can be read in the previous case study of the first pilot in Spain.

For this case, a comprehensive set of relevant data sources was used to describe the implementation of the reAct approach and the outcomes[18]. Table 14 describes the data that have been collected and analyzed for this case study:

Table 14 - Data Sources and Instruments (SP2)

Data sources & instruments	Description
Interviews	Nearly all interviews were recorded and some can be watched on YouTube. The student interviews have been used to create a 'reAct video'[19]. Follow-up teacher interview (recorded on YouTube[20]) in the context of another EU project. Two participating teachers explained reAct both in generic and practical terms. Post-pilot 2 evaluation interview transcript – 9 July 2012. 6 Semi-structured interviews (4 individual, and 2 group interviews) with students after P2 – July 2012 4 Semi-structured interviews (45 minutes each) with 4 teachers reflecting on the second pilot – July 2012
Questionnaires	Teacher questionnaires (P2) – pre-during-post • P2 response (6/6/6) Student questionnaire (P2) – pre-during-post • P2 response (32/35/27)
Artifacts & Activities	Several student projects and presentations, wiki page, and many shared teaching activities. The participating teachers were eager to share their approach in the International Facebook page and through email.
Teacher log books	P2: 5 teachers filled in 5 log books each during the entire second

[18] Being proficient in the Spanish language, the author was able to use original data sources provided by the partner and to have personal conversations with the participating teachers.

[19] The 'reAct video' can be seen here: https://youtu.be/wwZ-7rYXVZA (short version) and here https://youtu.be/pbghMPnjkPQ (extended version)

[20] The first part of the interview can be watched here: https://youtu.be/w6WjK4VVY8I and the link to the second part is in the description. Another group discussion with the partner and two teachers can be watched here: https://youtu.be/fkhjq1CBmUY

	pilot – 2 March / 30 March / 11 May / 1 June / 29 June 2012
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.
Personal notes	The partner used personal notes of (informal) meetings with (other) teachers and managers for the local pilot reports.
Facebook group(s) content (chat, links, discussions)	Facebook content and discussions were used for analysis, including shared videos and links, team formation and new Facebook groups, interaction and activity level.
Internet, websites	Information about the implementation context was found online. In addition, one of the teachers kept a website and richly documented his experience with reAct[21]. It also contains various links to YouTube videos, Slideshare presentations and other content related with reAct.
Internal communication and documentation	Basecamp discussions, shared internal documents and emails were used as data source.

An earlier version of this case description was submitted to the project partner, who provided suggestions to improve the description, details about issues that were unclear or ambiguous, and supplementary data for evaluation.

4.3.1 Context

The second pilot, as the first one, was conducted with students from the VET workshop program (Vocational and Educational Training), and part of the Valencia Community program to tackle youth unemployment. Most of these students had left school without a diploma and were given another opportunity to earn a certificate and work experience in a particular field. The program they had been accepted for was an 2-year program, the first six months devoted to training, and the final 18 months devoted to internships and work experience. The pilot was conducted during this first training period of 6 months. More information about the program can be found in the introduction of pilot 1 – Spain, chapter 4.2.

The pilot was conducted at institute Laurona VI, a vocational training center that was located in Lliria, on the outskirts of the city of Valencia. The school's curriculum comprised various topics ranging from social sciences to the arts, biology, engineering, physics, math, and languages (English, French).

The team of six teachers was contracted specifically for this pilot, and they enjoyed full autonomy to adapt the curriculum and to follow the phases and guidelines from

[21] http://www.grupovitruvio.org/novedades/fondodocumental.html

the reAct methodological approach. They were chosen because of their earlier affiliation and interest in the use of ICT in the classroom and their intrinsic interest in the project and educational innovation in general. They had 6 to 18 years experience as a teacher, and were aged between 37 and 56 years old. They taught a variety of topics including Gardening, Forestry nursery, Sciences and Humanities, Painting, Metal constructions, Lock work, Welding, Building, Maintenance, DIY, Restoration work, Electrical, Plumbing and Carpentry.

The school had a poor Internet connection, which meant that students could only use the online tools in shifts: after one group was finished, the other group could start.

The main problem, as reported by the teachers, was the lack of engagement among students participating in the program. Their attitudes, however serious, were to get a certificate and to get employment. Many of the learners had a negative past with regards to formal education, and showed a lack of confidence in learning new things, which fueled disengagement. Students were interested in the international aspect of the pilot, in particular the interaction with other students, and the use of ICT in the classroom, which was new to them. The teachers saw participation in the project as an opportunity to improve their teaching abilities and to explore the use of ICT. They were also curious about the possible impact of the approach on student engagement and self-confidence.

35 students (12 female) participated in the pilot, aged between 17 and 24 years. They were serious (and concerned) about their future and interested in learning more about the topics of the curriculum and obtain certification. They intended *'to grow as a person and to develop professionally'* or *'to learn from other students and value their work'*. Their experiences with ICT were very limited, and only two of the students had access to the Internet at home. The participating students had left school previously without a diploma, and were considered to be at risk of becoming economically marginalized.

4.3.2 Organizational Level

Teachers were prepared in an online and face-to-face teacher training program that started two months before the start of the pilot. The teachers received 35 hours of training before the start of the pilot and focused on trying out different ICT tools, and on (co-)creating strategies and learning activities. As in the first pilot, the partner, in collaboration with the teachers, made a selection of the tools to be used and supported during the pilot. During the pilot, the partner organized weekly online meetings with teachers to discuss progress, obstacles, and share ideas.

The pilot was organized as a completely new course within the regular school hours. The institutional assessment criteria of the VET program still applied, but teachers were free to adapt it to be able to integrate the reAct pedagogical principles. Around 15 hours per week were dedicated to reAct activities.

4.3.3 Pedagogical Level

Familiarization. The student familiarization phase was organized in a similar fashion as in pilot 1: students were given personal notebooks, and learning activities focused on familiarization with the tools in collaboration with the teachers. Importantly, teachers participated in the collaborative exploration of ICT tools on an equal level as students, which had a positive effect on the relationship between teachers and learners. After the selection of tools, teachers proposed specific activities for specific tools and linked those activities to the next phase by asking students to think about (and create and share) ideas for a collaborative international project.

It was difficult to convey the reAct approach to students, according to teachers. Initially, they did not understand why they had to work on topics unrelated to the school's curriculum, or with other students across Europe. Gradually, their skepticism turned into interest, both with respect to the reAct approach (self-guidance, interest-based approach) as well as in the international aspect.

International project phase. Due to the slightly chaotic experience during the first Spanish pilot (see previous case study), more coordination was introduced in this pilot, including manuals and a timeline with clearly defined steps. First, students were asked to share their interests online using the general Facebook page. When someone was serious about 'coordinating' a group, he or she should make a new group in Facebook, and add the link to this group in the general reAct Facebook group. Student projects included *'Extreme Sports'*, *'the End of the World'*, and the *'World of Dreams'* and to facilitate collaboration, the students initiated project pages on Facebook. One of the groups under Spanish coordination was the group about *'World of Dreams'*. The coordinator used Google Translate to translate all of his messages into both Dutch and English (there were two 'International group members' from the Dutch pilot), and was responsive to new posts from other members. In one of the first threads, he had outlined the objectives of the group project (in Spanish, English, and Dutch). The main product to be developed was a Prezi presentation about dreams. The teachers furthermore helped students to divide tasks, and proposed a number of sub-topics and activities to be conducted to develop the presentation (i.e. psychology of dreams and Freud, finding images, phases in sleeping, and more).

Still, this phase was considered somewhat chaotic and teachers felt uncomfortable to support students in doing projects about topics they knew little about. Due to a lack of clarity of the process, limited support from teachers, and language problems, international collaboration was (again) difficult to organize. Student appreciation for, and perceived relevance of international aspect of the pilot was relatively low. It was suggested that more preparation time was needed to develop a more effective a support structure and better protocols. For example, the idea to have students vote on student project proposals did not work out: not all students participated in the

voting and some students were offended and frustrated when their project was not chosen. It was concluded that, in this case, voting hurt the 'collaborative atmosphere' in class. Another suggestion was to enhance communication between the participating teachers from the various countries.

On the positive side, students did appreciate very much the possibility to choose their own topics, and to be able to collaborate with peers on these topics. Also, the international presentation sessions were very successful and motivated students to finish their projects.

Local project phase. At the start of the local project phase, six student groups were formed, one about teaching support (focused on explaining the reAct approach), and one per specialty: construction safety, gardening, building, painting, and metal-working. The actual topics of the projects were to be chosen by the students, resulting in projects about the following topics:

- Teaching support: the objective of this project was to produce a menu or guide that explains each stage of the reAct project. Students were responsible for explaining the different stages, from their point of view, from the familiarization phase to the local project, with specific mention to the ICT tool used during each stage.
- Building project – "Construction Safety": within the discipline of construction, students chose to focus on construction safety. This happened during one of the meetings that was led by the students themselves, all alone, without teacher presence. Glogster was used to collect various media related with the different construction safety topics, and a presentation was made in Powerpoint and subsequently published online (using Slideshare).
- Similar project outlines were developed (by students) for a gardening project (resulting in a "Prezi" presentation); a project about renewable energy (resulting in a student reference sheet for future student projects about the topic); and two exploratory projects about artistic painting (collaborative research project involving artistic heritage in the historic center of Lliria) and local artistic metalwork.

The local project phase was the most engaging part of the pilot: all students actively participated in collaborative projects. Teachers considered coordination of local teams (as opposed to international teams) to be much easier, and there was no language barrier. Teachers reported better attitude among students, and learning gains in terms of curriculum content knowledge and skills such as collaboration and project-management skills. The focus on curricular topics increased students' perception of relevance and the high level of autonomy they engaged them and improved their confidence.

Integration. During this phase, teachers returned to the regular curriculum, reflected on their experiences, and integrated the reAct principles. By this time, students were

used *and* felt more confident to make their own decisions. The return to the regular curriculum was met with some resistance, but an experiment dubbed the 'self-organized learning environment' generated great enthusiasm and engagement. Two of the participating teachers were invited to a conference in France. Instead of re-allocating the classroom sessions to another week, they confided in the students' abilities to self-organize these sessions. During one week, their students were supposed to run the learning environment by themselves, with two online meetings to discuss the questions and progress with the teachers. After that week, teachers asked students to suggest the focus for the final part of the program, and the sequence of activities and topics.

Students were proud on their achievements during this phase, and teachers were proud on the fact they had been able to let go. All teachers felt sufficiently confident to further integrate the approach into other classes and future activities.

The teachers suggested that successful integration would depend on the quality of collaboration between participating teachers. Preferably, such collaboration would happen within a wider network or community of (Spanish-speaking) teachers to add diversity and enable substantive support for a wider variety of topics.

The teachers in the second Spanish pilot were very serious about their participation in the project, and were very serious about learning about its pedagogical approach. They received a substantial training and also spent much free time reading about pedagogy and trying out ICT tools. Teachers actively integrated all reAct principles in their pedagogical approach, which is summarized in Table 15.

Table 15 – Pedagogical Principles (SP2)

Principle	Description
Relevance	Much effort was spent on making students understand the approach, their responsibilities, and the underlying principles. Students were also involved in the creation of a video about 'the reAct experience.[22] Students appreciated the local projects more than the international projects, because the topics were clearly related to curriculum topics and more substantially contributed to obtaining certification. Teachers were also more confident and able to give substantive support for curriculum-related projects. Placing activities within the local context s, such as historical artifacts in the city, and ask students to go out, and investigate, appealed to and engaged many students.

[22] The video with the student reflections can be found here: https://youtu.be/wwZ-7rYXVZA

Self-guidance and ownership	In the teacher surveys, only two out of six teachers indicate that self-guidance was an important motivation for students, but at the same time, the data indicates a learning environment where students enjoyed considerable amounts of freedom and autonomy. Teachers were committed to foster self-guidance, but offered substantial support to students and groups who failed to progress in a way that helped them cope with autonomy. Teachers made sure that there were sufficient opportunities for students to influence the learning process, the assignments and tasks. Learning activities were negotiated with students or co-created with them. To promote autonomy, teachers assumed the following roles: as counselor (promoting critical thinking, being empathetic and patient), as guide (explaining and pointing them to the right resources, tools), and as project manager (coordinating tasks, reminding students, keeping overview). Different students could handle different levels of autonomy: some would resist or become disengaged with even a limited amount of autonomy, while others could cope with complete autonomy and very little support. Personal projects were encouraged, and by distributing the tasks and groups among them, teachers were relatively effective in attending to individual requests.
Collaboration & Interaction	Collaboration was one of the essential 'ingredients' of the pilot. Most activities were supposed to be done in teams and teachers offered support for team formation and tips for effective collaboration Students considered the collaborative and interactive element, as well as the 'different relationship' with the teachers, to be the most engaging factors. The students' expectation that others were working hard was an incentive for them to work hard as well. Teachers suggested that some level of competition between groups was effective. Because students were co-located during the local project phase, support was easier and activities organized more effectively. International collaboration, due to language barriers and difficulties of coordinating online was considered too challenging (e.g., difficult to make agreements, understand each other, get feedback). On Facebook, students were expecting 'Likes' or comments instantly, and were disappointed when this did not happen. More general, engagement seemed to be linked with the expectation to get feedback from peers. The international context appealed to students, and sharing their projects through Facebook engaged and motivated them as they felt part of a larger community.
Trust	Activities such as the collaborative exploration of ICT tools, and the personalized approach of teachers, improved student-teacher relationship. According to the students, this 'new' relationship was one of the main drivers for success. The 'self-organized learning environment' was an experiment that worked out very well: the students demonstrated, to themselves, their parents and friends, the teachers, and the management to be capable of successfully running their own classroom.

Students were asked to send updates about their projects, and their final products, by email to all teachers, to make sure that all teachers were up to date and could personalize their support for each student or student group. During familiarization, students were supported in the use of ICT, and vice versa: some students offered help to teachers. During the project phases, clear tasks and activities were developed

to help students progress step by step. From the local project onwards, students were assessed using the regular curriculum assessment criteria. In addition, there was formative assessment addressing the individual contributions and activities and group projects and activities.

The tools selected during Familiarization phase concerned mostly creative and presentation tools, as well as Google Search and other web-services that facilitated exploring topics and organizing content. Facebook and email were the main communication tools.

4.3.4 Results

Apart from some frustration during the International project phase, many positive effects were reported, including improved attitudes towards learning, better school results, and an improved relationship between teachers and students. The reAct approach inspired the teachers to take a step back and focus on facilitating individual students in their learning process. Students developed relevant skills that were normally not part of the program, including collaboration skills, presentation skills, research skills, and ICT skills.

Engagement

Students welcomed the personal notebook at the beginning of the pilot and remained engaged during the collaborative exploration of ICT tools. The collaborative atmosphere created during this activity was an important first foundation for a rather successful implementation of the reAct approach. During the International project phase, some students and teachers became frustrated: slow communication, limited feedback and support from teachers, and little progress were the reasons that were mentioned most frequently. The local project had more positive effects: there was a collaborative atmosphere, much engagement, and a high level of self-organization among students and within student groups. The students presented their results in online videoconference to students from other pilots, which further increased their engagement, also to finish in time.

The reAct pilot was organized as a full course as part of the program, and therefore compulsory for the participating students. As much as 21 respondents (72%) indicated to have spent three days or more - per week - on the reAct project. The response rate on the student questionnaires was 90%, and 100% for the teacher questionnaires and overall, students were positive about the pilot. At the end of the pilot, more than half of the students indicate to have been engaged throughout the pilot, while 45% reported to have been ‘sometimes engaged’, and only one respondent ‘not engaged at all’. Students worked on their projects not just during class hours, but also after school and at home.

Skills and Attitudes

Students were positive about the impact of the reAct implementation on their communication and collaboration skills, confidence level, learning skills, teacher motivation, and relationship with the teacher. Their response was neutral with regard to the perceived impact of the pilot on their employability.

Group work seemed to be particularly motivating and educational, and facilitated negotiation skills, seeking consensus, and attitudes like empathy and tolerance for diverse opinions. The class cohesion improved and a 'sharing attitude' emerged, *'extending the collaborative work even beyond the classroom'*. Students were committed and disciplined, punctual and all students took responsibility to meet deadlines and finish tasks assigned to them. Despite several setbacks, and a disappointing international collaboration phase, students persevered and showed resilience, which is illustrated by the following quote of a teacher: *'I'm proud of how students have overcome little difficulties that have been emerging in the process of developing projects (initial rejection, lack of ICT skills, fears, doubts). This has meant in some students a personal growth (learning to overcome difficulties, tolerance in teamwork, etc.)"*. Students were open to new activities, which they approached with more self-confidence. Students developed self-esteem and were generally proud on their achievements. They felt they had developed relevant skills and had grown in personal autonomy. There was less fear of public speaking and students improved their presentation skills. Improved language and communication skills were also reported. For example: the use of Google Translate offered alternative translations to students, synonyms, and forced students to enter the correct input sentence (*'The students have gradually started using Google translator and they even improved the use of Spanish in order to obtain meaningful translations.'*). Also, students (and teachers) became more proficient in using a social network to communicate with others, and in information management. According to one teacher *'students' ICT skills at the beginning was nearly zero and they refused working with the notebooks, preferring manual labor instead'*. Their attitude and understanding of ICT as not just a tool for leisure also changed, and students developed a broader perspective on the use of ICT, which, as one student explained, *'is not just for playing with friends, but also for work and learning'*.

Interestingly, the teachers also explained that the approach would be effective to teach curriculum content, and reported that students had significantly improved their knowledge of curriculum topics after the local project phase.

There was a different and improved relationship between the participating teachers and the students. One student, after the familiarization phase, said: *'we felt colleagues when working together'*. Also, students developed a broader perspective on the concept of learning, illustrated by the following quote by one of the students: *'I realized that learning was not the same as memorizing stuff'*. Feedback from parents indicated that the positive attitude in class also translated into improved behavior at

home. The effects reported by parents included following a schedule, getting up early, participating in domestic activities, a dynamic attitude and less apathy.

The pilot had positive effects on the teachers, some of whom were skeptical about the reAct approach at the start of the pilot, in particular about the students' abilities to self-organize and the predicted effects on student engagement. The teachers were inspired by the reAct approach, and were very pro-active in looking up definitions, finding more documentation about relevant pedagogical principles, and in discussions with the partner. They actively reflected on the process using the logbooks and tried to connect with the teachers and partners from the other pilots. The results exceeded their expectations: they reported that *"the students feel their opinions are important, their participation has been higher than expected"*, and that their objectives were achieved in a very short time. They considered the pilot a success, with very positive and promising effects on students and teachers. Teachers enjoyed the experience of students becoming more confident in organizing their own tasks, managing their own projects, and feeling responsible. All teachers expected to continue working with the approach. As one teacher said: *"From now on I could not teach differently as what we did in this course. Now I know this methodology, I do not want to go back to the traditional way of teaching"*. Although it was considered challenging to adopt a new teaching approach, the teachers considered their efforts worthwhile and the feedback they got from interactions with the students sufficiently rewarding to continue with it. One teacher explained the challenge as follows: *"Applying this methodology has both facilitated and complicated my teaching tasks. On the one hand I had to prepare less materials and contents, but it has cost me more to help them to learn how to find the right information, manage and present it etc."*. Most teachers were proud on their accomplishments and their achievements. Also, it broadened their beliefs about education and teaching and changed their assumptions about what 'these kinds of students were capable of'.

4.3.5 Conclusions and Reflection

The second Spanish pilot was done in a context that was supportive, with teachers who were interested and took time to invest in better understanding of the approach. The target group consisted of students who had dropped out of education, and were enrolled in a program that allowed them to obtain relevant certification and work experience.

This case demonstrates, under the right circumstances and with sufficient effort and commitment, the reAct principles can effectively inspire teachers to create a highly dynamic and engaging learning environment. The following sections reflect on this successful implementation as a consequence of context, the organizational support, and pedagogical approach.

Context

The students were nearly all 'early-school-leavers', with negative experiences in formal education. According to teachers, initial participation was hampered because of a general 'fear of failure'. The personal approach, different from what students were used to (in education), changed the students' perception of education and made them feel relevant. One of the factors that made implementation possible was the relative teacher autonomy with regards to the curriculum: there was room for experimentation on both the learning process and the outcomes (i.e. assessment). This, combined with strong management support, provided the right conditions for this pilot, according to the participating teachers.

Ultimately, the lion's share of the success of the implementation was due to the open, critical, and committed attitude of the teaching team.

Organizational Level

The focus and commitment of teachers can be explained partially by the fact that reAct was integrated in a completely redesigned course. Both students and teachers felt responsible for the eventual success of the pilot (as a result of their own participation). Other factors that contributed to the successful implementation of reAct principles included the *early involvement* of teachers, the *focus on pedagogy* as well as ICT during teacher training, and the *level of support from the local partner*. They were confident enough to start experimenting with the reAct principles at the start of the pilot, and were confident to continue with it after the pilot ended. Collaboration with colleagues needed improvement; in particular, they would have liked to share experiences and ask questions between them in a more structural way. With regard to the content of the teacher training, they suggested to include more activities that addressed facilitating and assessing project management, ICT skills, and communication skills. Finally, the teachers liked to explore '*fuzzy concepts like trust and creativity*' but at the same time missed clear guidelines on how to put these principles into practice.

Pedagogical Level

The teaching team seemed to have found the appropriate balance, for each individual student, between structure and autonomy. The least engagement was during the international project phase, when teacher support was limited. Students were most engaged during the local project phase, when there was limited choice for students (in terms of project topics) and more structured and support, but at the same time sufficient opportunities for self-guidance, choice and ownership. Students worked relatively autonomously in teams, knew what was expected from them, and could relate their activities with their own *and* the formal learning objectives, resulting in high perceived relevance. Teachers also assessed the various processes, including group work, project management, and communication.

Role of ICT

The use of a reduced toolset was appropriate – especially at the start of the pilot, and it was even suggested that the number of tools should be reduced even more (ten instead of twenty). The teachers were very positive about the role of ICT in the pilot, which supported creative expression, increased efficiency, and supported a completely different approach, most pronounced during the self-organized classroom experiment. They were less able to address ICT skills, because they knew too little about this.

The slow Internet connection proved to be a major barrier in adopting the ICT tools that were part of the approach, which were primarily web-based. Time was lost on loading tools, and frequently, activities even had to be abandoned due to the limited bandwidth. On the positive side, in order to reduce the number of people online at the same time, teachers devised a scheme that allocated time online per student. This structure created an incentive to students to prepare their limited time online well in advance, because time online was a scarce resource.

Overall, teachers appreciated the use of social networks and other ICT, as it helped them reflect on their teaching and improved their confidence and ability of using ICT in other courses. The use of Facebook supported the communication between students and teachers, and also was considered a low barrier to share 'stuff' with peers using Facebook groups. However, to manage projects, it was considered inappropriate, also by students. Also, not receiving feedback (or Likes) could demotivate students. The use of Google Hangout, used during the international project presentations and the 'self-organizing classroom' experiment, engaged students. The use of Google Translate even improved students' language skills in both English and Spanish as it forced them to use the correct words and phrases to get a sensible translation.

Students felt overcome by all the information – especially during familiarization and the international project. The more structured approach during the local project was more effective, as it helped them find more specific information. Teachers found out that many students lacked basic ICT skills, which resulted in frustration and (temporary) disengagement when things did not work out as expected. For example, the simple process of reducing the file size of a picture before uploading caused concern and students seemed unaware of the possibility to use the Internet to retrieve a solution for such problems.

In this case study, we saw significant management and partner support, an appropriate training context with room for exploration, committed teachers and students, a long and thorough preparation, leading to several appropriate and effective pedagogical decisions and strategies, and ultimately, high student engagement. The next case study, Italy, offers a completely different perspective on the implementation of reAct.

4.4 Italy (IT)

The first Italian pilot was conducted at two formal high schools: Corinaldesi (CORI) at Senigallia, and "Polo 3" (POLO) at Fano both located on the east-coast of Italy in the Marche region. The second pilot was conducted at Polo 3 only. The pilots were executed under the supervision of TRAINING-2000, the Italian partner in the reAct project. Since 1994, the TRAINING-2000 organizes vocational training courses in various areas, including ICT and innovative pedagogy. The following data have been collected and analyzed in the development of this case study:

Table 16 - Data Sources and Instruments (IT)

Data sources & instruments	Description
Interviews	Pre-pilot 1 preparation and context analysis interviews with the partner – 60 minutes on 7 April 2011 6 Semi-structured interviews with student groups from both schools – 17&18 December 2011 (after P1) 1 Semi-structured group interviews with 2 teachers. June 21 2012 (after P2) Post-pilot 2 partner evaluation interview transcript – 6 July 2012.
Questionnaires	Teacher questionnaires (P2) – pre-during-post. • P2 response (6/4/3) Student questionnaire (P1/P2) – pre-during-post. • P1 response (CORI: 25/25/13 & POLO: 37/30/24) • P2 response (17/17/11)
Artifacts & Activities	Several student projects and presentations, wiki page, and many shared teaching activities.
Teacher log books	P1: the partner filled in the logbooks in collaboration with the participating teachers from both schools: 2 logbooks during P1 – 14 October & 11 November 2011 P2: the partner filled in the logbooks in collaboration with the teachers: 3 logbooks during P2 – 20 March, 10 May, and 6 June 2012
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.
Personal notes	The partner used personal notes of (informal) meetings with (other) teachers and managers for the local pilot reports. The partner also contributed personal reflections after each of the pilots.
Facebook group(s) content (chat, links, discussions)	Facebook content and discussions were used for analysis, including shared videos and links, team formation and new Facebook groups, interaction and activity level. The Italian students were the most active on Facebook, especially during P1.
Internet, websites	Information about the implementation context was found online:

	http://www.polotrefano.gov.it/ & http://www.corinaldesi.gov.it/ & www.training2000.it/
Internal communication and documentation	Basecamp discussions, shared internal documents and emails were used as data source. After the project, we communicated through email several times to discuss the Italian case.

4.4.1 Context

The Italian pilot started with four cohorts from two schools: one from Senigallia called "Corinaldesi" (CORI), and three cohorts from Fano called "Polo 3" (POLO). Table 16 describes the different schools and cohorts in more detail.

Table 17 - Schools participating in the Italian pilots

School + type	Pilot	Topics
Corinaldesi (Senigallia) – technical school (one cohort)	1	Offers both theoretical education and technical specialization in a specific field of studies (e.g.: technology, informatics, economy, humanities, administration, law, accountancy, tourism, fashion), often integrated with a six months internship in a company, association or university, during the fifth and last year of study.
POLO 3 - A. Olivetti – professional institute (two cohorts)	1 & 2	Practical activities, with the aim to facilitate the direct entry of the student to the labor market (engineering, agriculture, gastronomy, technical assistance, handicrafts).
POLO 3 – Apolloni – art lyceum (one cohort)	1 & 2	Oriented toward arts teaching – both in a theoretical (i.e. art history) and practical (i.e. drawing sessions) way. Specialization in a specific field, including painting, sculpture, decoration, graphics, design, audiovisual, multimedia, scenography and architecture.

The schools have different curricula: the art school is more theoretically oriented as well as creative, while the professional school offers practical activities (engineering, agriculture, gastronomy, technical assistance, handicrafts) with the aim to facilitate the direct entry of students to the labor market. The idea behind the implementation of reAct within the context of a regular high school (formal program) was to understand the limits and potential of the approach in a formal context, as compared to the other pilots, which were executed in non-formal educational contexts. The underlying idea was that reAct could also be an appropriate approach to address dropout prevention, rather than just remediation.

Generally, high school students in Italy follow education for a period of five years, which is concluded with a state exam and diploma. This is required for students willing to enter university. Professional institutes also offer certificates after three years, after which students are allowed to quit school (at age 16).

ICT use in the schools was limited to administrative purposes (class register) and finding online information to support classroom sessions. At POLO, there were ICT restrictions that prohibited the use of certain websites, such as YouTube and Facebook within the school.

The participating schools were obliged to strictly follow the national curricula with limited room for local adaptation. Teachers had to report their activities using a formal reporting framework, based on and in line with the national curriculum and activities and outcomes beyond those written down in the framework did not count in the their evaluation. Few teachers engaged in professional development, due to the rural location of the schools (most trainings were available only in the cities), and because teachers were not supported to participate in professionalization activities. The reAct project offered a free training to teachers, which was an important reason for teachers to sign up for participation.

The Italian reAct teachers were 'seasoned' teachers with – on average – 26 years of teaching experience, but none indicated to have any experience with student-centered, collaborative learning, or ICT. In the first pilot, 13 teachers participated, and in the second pilot, 6 teachers.

The first pilot, cohorts from two schools participated with 100 students aged 15 to 16 years. This high number of Italian participants disrupted the balance or diversity online during the first pilot, and to restore the balance in the second pilot, fewer Italian students participated. In both pilots, most students seemed uninterested in school and about one-third was able to explain their professional or academic ambitions. There was a clear difference in answer length and 'seriousness' between answers of students from POLO and CORI (pilot 1). Answers from POLO students were shorter, less serious, less elaborate, and showed less imagination or effort, which reflected a lower initial commitment and interest. Students from both schools expressed high expectations of the international aspect of the reAct project.

According to interviewed teachers and managers disengagement of students and early-school leave were significant problems. The most important cause was that (formal) learning content did not challenge or interest the students. Student disengagement tended to get worse when students grew older, leading to high numbers of students who decided to quit once they reached the age of 16 where no further schooling is compulsory. As a goal for participating in the project, teachers hoped to develop pedagogical skills as well as becoming more experienced with the use of ICT in the classroom.

Between the first and second pilot, the setup, context and implementation were more or less the same. An important difference, however, was that during the second pilot, teachers requested and received more support from Training-2000. A tutor was provided to support the teachers, and who was present during all reAct sessions. Another major difference was that the second pilot was conducted with

'just' two classes from one school, in order to make it more manageable (the support) and to have a more balanced presence of students online. The second pilot was two weeks shorter than pilot one due to the examination period in May 2012. In the first pilot, the difference between the two school contexts (CORI versus POLO) was that at Corinaldesi, there was the involvement of the entire group of teachers who belonged to the school advisory committee, while at Polo 3 only a few teachers of the various classrooms (2 in each classroom) participated. In other words, there was less high-level support at Polo 3.

4.4.2 Organizational Level

To promote the project among teachers, the project was presented with the option of following a free and certified teacher training (at location) about the use of ICT in the classroom. The topic of the teacher training, prospect of certification, and the proximity of the course attracted interest from nearly 40 teachers from various schools, and 34 eventually participated. The teacher training before the second pilot attracted a total of 9 teachers. The training consisted of three sessions of three hours. The training was focused on the trends of the ICTs in education, the implementation of ICT in class and the main pros and cons. During the sessions, several ICT tools (Facebook, Diigo, Wordpress) were discussed and explored. The Italian partner offered continuous (weekly) support to teachers during P1, and increased its effort and support during P2 through participation during classrooms sessions and communication with the students as well as by providing a tutors to support the teachers.

The pilots took place in a regular high school as part of the regular curriculum. ReAct activities were organized as an additional activity, meaning that students and teachers had to follow the formal curriculum *and* participate in the reAct project. In both pilots, approximately two to three 'reAct hours' were scheduled per week. Due to the limited number of class hours scheduled for reAct, students also carried out the activities at home.

4.4.3 Pedagogical level

As will become clear, the limited time scheduled for reAct made implementation significantly more challenging than other pilots. It was difficult for teachers to prepare their reAct sessions, or to coordinate activities between them. Eventually, during the second pilot, teachers reduced their efforts and let the tutor organize the implementation. The pedagogical approach was predominantly teacher-centered and the content mostly subject-oriented. The self-organized and self-guided student projects were unsupported by the teachers, which frustrated many students. Teachers primarily focused on the subjects that were part of the curriculum and final examination.

Familiarization. The 'familiarization phase' in both pilots was aimed at exploring ICT tools with students and to identify opportunities to enhance the learning experience using those tools. The concept of Personal Learning Environment was discussed, and students were asked to visualize their 'personal learning environment' (PLE). They had to think about the use of ICT in their regular life, and were then asked to draw a map of all resources in their daily life that contribute to their learning (see Figure 19). The result was a visualization of personal learning environment that described many different activities and elements, such as physical spaces, writing and drawing, audio, and formal training. They then discussed how learning is not just something that happens at school, but is a continuous activity. The idea behind the activity was that students, in the subsequent phases, would update their visualized PLE with the tools they used in their projects, and to become aware of the opportunities of ICT for learning. Due to a decrease in engagement and limited support from teachers, the objective of updating and reflecting on one's PLE was not met.

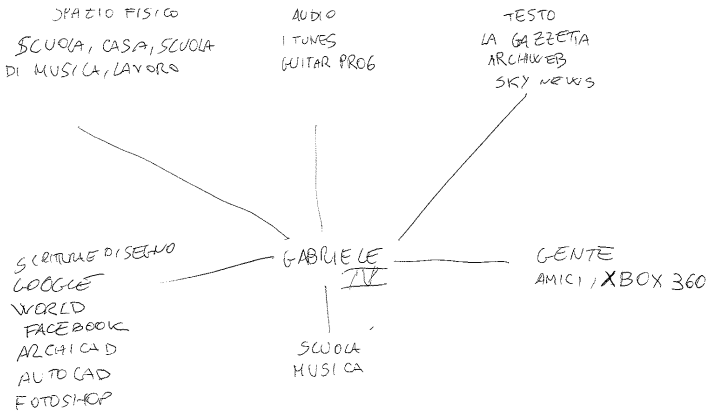

Figure 19 - Student visualization of a Personal Learning Environment (IT)

Most activities during this phase engaged students. The use of ICT appealed to them, and they were especially thrilled about the idea of doing a personal project with other students across Europe. Students and teachers reflected on this phase by proposing a stronger focus on required skills for the subsequent phases, such as self-organized learning, project management, and (international) collaboration. Also, the objectives, tasks, and relevance of reAct were not made clear to students, who thought of the project as a nice distraction, a leisure activity.

International project. All students were appealed by the idea of connecting with students from all over Europe. They were asked to interact with peers from other countries on the Facebook group, share videos and content of their own interests, find peers that shared the same interests, and to form a group on Facebook (or through another tool) to start discussing the objectives of the project. It was suggested to students that everyone would be able to do their own project. However, teachers strongly encouraged students to become part of a group, and some students felt misled when their topic was not chosen, which significantly harmed their engagement. In Italy, the students proposed or joined groups related

Figure 20 - Using Facebook for 'collaboration' (International Project phase - IT)

with photography, fashion, sport, manga/anime, technology, abandoned animals, gastronomy, the Hard Rock Café, modern music, traditional music, and regional culture.

To illustrate the role of Facebook during the start of the international project, we have included a screenshot; see Figure 20. It shows a conversation of students who joined a group on manga/anime. The three threads in this example show different elements of the reAct approach: a conversation about a manga character (interest-based conversation), an announcement for new YouTube channel (promotion), and a question about the objectives of the project/group (project based learning). The last thread also represents the problem many of the participants faced: after sharing their interest online, how to proceed? There was limited support during this phase: none of the teachers spoke English proficiently and were unsure how to facilitate international group work. Students frequently used Google Translate to interact with participants from other countries, make inquiries about their interests, and to respond to their comments and questions. When asked how students would describe reAct to family and friends, very often they would mention the international aspect, for example: *"A project that allowed to communicate with foreign students and meet new friends"*. Due to a language barrier and limited support from teachers, most groups eventually consisted of just Italian students. For participants from the other countries, it appeared as if the Italian students were very young and with completely different interests, due to their age.

In general, teachers and students experienced the international project phase in both pilots as chaotic and difficult to organize. There was much confusion about goals, tasks and responsibilities. Students did not know how to progress, and teachers were unable to structure the activity for students in an effective manner.

Local project. During the 'local project' phase of the pilots, teachers returned to a more teacher-directed approach and designed learning activities that were more in line with the formal curriculum. The 'business letter' below (including the typos)

was distributed to all students of one class (POLO) who then had to translate the letter into Italian and put the sentences in the correct order. The assignment was supposed to teach students how to use Microsoft Word, and use professional fonts. Also, they would improve their English language skills along the way (despite the spelling errors contained in the assignment text).

Assignment: Reorder the sentences using the correct layout and translate the letter into Italian

Your Ref: JB/ st

Our Ref: VF/ nm

20 April 2012

Intermotor LTD

Electrical Manufactures

Occupation Road, Nottingham, NG15 5DZ, England

Fax: (01602) 637007

Tel: (01602) 680234 E-mail: interinfo@intermotor.co.uk

Registered in England n. 955889

VAT Reg. n. GB 134 66787

Dear Sir

The Garden Center

46 Hill Avenue

Rocher

Kent RC62 9FD

Yours Faithfully

We look forward to receiving your initial order and we are confident that you will be completely satisfied with our service.

Many thanks for your recent enquiry about our products.

We enclose our catalogue and an up-to-date price-list. Alle prices are quoted CIF Liverpool.

Your enqury of 7 March 2012

Our company has been producing electrical equipment for over fifty years and has a reputation for quality, solidity and style.

Vincent Franco

As you are a new customers, we are pleased to be able to offer you a special trade discount of 15% off our list prices. Our payment terms are L/C at 30 days.

Encls: n. 2

Figure 21 - Business Letter in English (Local Project phase - IT)

An example 'local project' activity from CORI comes from the mathematics teacher. She asked students to collaboratively investigate the use (and misuse) of water in Italy. In class, a discussion was started about how people can mitigate their water consumption and awareness was raised about the problem of water deficits. Students then autonomously carried out their research using online resources, Google Docs, and taught themselves to use tools like Excel to do calculations and visualize the data. A local Facebook group was initiated, which was used to share updates, relevant links, and maintain communication between participants (student-student and student-teacher). The final product for each of the groups was a presentation that had to be uploaded to Slideshare. The learning activity aimed to foster project-based learning, inquiry learning, and improve collaboration and ICT skills of students.

Overall, the teacher-led and more instructive approach led to higher engagement among students, who, according to the teachers, expected and wanted to be told what to do.

Local integration. Teachers returned to teaching the regular curriculum, and offered regular assignments. The intention was to use ICT more frequently in the learning activities. One example of local integration was by the mathematics teacher (P1 – CORI), who experimented with the concept of a *flipped classroom*. She used a wiki site to share relevant materials, videos and a link to a visualization tool with their students. She even used translation and subtitling software to make the English-spoken videos useful for the students. She asked the students to explore the materials and try out the tools both at school and at home, and discussed in class the various visualizations and questions contributed by the students. The math teacher also used technology to support a student with hearing loss in this same manner (i.e. through extensive use of multimedia, self-guidance, and a-synchronous reflection). This happened when she was not formally involved in the reAct project anymore.

Other than these interesting results, the reAct approach did not seem to be integrated into the regular curriculum. The reasons that were reported include the following: i) perceived irrelevance of the approach, ii) lack of knowledge and skills to do so, iii) lack of available materials and activities, and iv) no assessment framework that links the activities with the formal curriculum and learning objectives. Only few of the teachers were consistently interested in the approach, and those who were, were primarily interested in the use of ICT, and showed less interest in the pedagogical aspects. There was little interest and support from management for integrating the approach.

The Italian pilots explored a various pedagogical and instructional approaches. The table below describes the pedagogical principles that were most pronounced, based on assignments and learning activities included in the data.

Table 18 – Pedagogical Principles (IT)

Principle	Description
Self-guidance	As a whole, there was only limited room for self-guidance. Most of the learning activities and assignments were uniform and highly structured. However, during familiarization, and especially during the international project phases, students were left to themselves to develop project a proposal, form a group, establish group objectives and a planning, and execute their projects. Initially, all students liked the idea of autonomy and being able to define one's own learning objectives. Students self-organized into new Facebook groups related with a specific topic, invited others and promoted the group, and discussed about the topic through videos, pictures, regular posts. The interaction in groups often remained superficial, and students generally did not produce anything meaningful or significant.
Collaboration & Interaction	Much emphasis was put on collaboration and collaborative activities. Students liked the idea of 'international collaboration' and interacting with peers from other countries. Teachers integrated interactive and collaborative activities, such as demonstrated by previously described the 'Water management'. Teachers were also particularly interested in using Facebook, because it was considered an effective way for them to interact with their students and to get to know their interests. Sharing 'final products' online, 'receiving Likes' on Facebook, and presenting those during the international presentation sessions encouraged students and made their participation feel more meaningful.
Relevance	The perceived relevance of the reAct activities was low, and increased when teachers introduced more structured activities that were linked with the formal curriculum. The lack of significance of student projects, the superficial interaction with others online, and the limited feedback and support from teachers made many students think of the reAct project as leisure activity, rather than a learning activity. Curriculum assignments were considered more relevant, because it was clear to students what was expected from them and they could relate the assignment to traditional learning goals from the formal curriculum.

Teachers training and familiarization activities were predominantly focused on the use of ICT for learning. This focus on ICT was also reflected in the teachers' logbooks, which described experiences with ICT in general as well as specific tools used in class. These tools included desktop tools like Word and Excel, social and video-sharing tools like YouTube and Facebook, and blogs and wikis. At least in part, the use of ICT was a learning objective in and of itself, rather than an instrument to particular pedagogical practices.

In order to make use of ICT, students had to use the school's ICT lab: students did not have their own laptop with them at school (BYOD: Bring your own device). Mobile phones were sometimes used to log in to Facebook, but rarely for other activities.

4.4.4 Results

The impact on students and teachers, in terms of engagement and the development of skills, was limited in both pilots, as detailed in the sections below.

Engagement

At the start of both pilots, students and teachers had high expectations. In the first pilot, this led to a strong Italian presence on the reAct International Facebook group: their ideas, propositions, and invitations for new Facebook groups 'flooded' the International Facebook group, and seemed to (negatively) affect the participation level of students from other countries. After this initial boost, when groups had to be formed and the initial ideas had to be elaborated into real projects, many Italian students either became inactive or remained active only on the Facebook group. Despite a relatively large number of International Project proposals by Italian students, around 6 in pilot one and 3 in pilot two, there were very few tangible results at the end of the phase. Limited feedback and support as well as inability to self-organize the projects led to disengagement during and after the International project. In pilot two, the decrease in activity level and engagement was smaller, due to a stronger involvement of the partner.

The first pilot was rated neutral to positive, which was lower than average. In the second pilot, students had a similarly neutral to positive experience, although this improved somewhat after the International project phase. Consistently, responses indicated that the pilot did not challenge the students, while on the other hand students indicated that it was one of the most important principles with regard to their engagement. Teachers said they were incapable to create more challenging activities, due to a lack of time and skills. Over 35% of the inactive students in the second pilot indicated that the primary reason for inactivity was a lack of interest generated by the learning activities.

During the first pilot, more than half of the teachers became disengaged with the project or withdrew entirely. A lack of time and limited support were the main reasons that were reported. Therefore, to reduce the pressure on the teachers in the second pilot, teachers were supplied with a tutor who supported them during each reAct session. As a consequence, most teachers felt less responsible and let the tutor (in collaboration with the partner) do most of the work, such as preparing learning activities and guiding students. Teachers were not convinced of the usefulness of reAct and its applicability within a formal educational context.

Skills and Attitudes

The students were somewhat positive about the perceived effect of the pilot on their communication and collaboration skills. Participation mattered, however: actively engaged students were more positive than those who were inactive. With the exception of one teacher ('the mathematics teacher' described in section 4.4.3), we

saw little impact on teachers. According to the partner, some of the teachers followed this approach more as observers than as active participants.

4.4.5 Conclusions and Reflection

The context in Italy was a challenging one. The strict institutional environment, the learning context and formal goals, and subsequent limited time and management support for teachers, explains that reAct was organized 'on the side' and never the complete focus of the participants, and results were below expectations. Despite small successes, and initial enthusiasm among students and teachers, overall effects were limited. ReAct activities often had to make way for the formal program, and gradually the interest in and commitment to make reAct a success faded. Activities were not considered challenging or engaging, and as a response teachers returned to the pedagogical approach they were used to, which was preparing assignments with limited autonomy or control for students.

The discussed activities and assignments demonstrate limited understanding of how to apply or integrate the reAct principles. Some teachers explored a more supportive, rather than instructive, role, but often lacked the skills to do this effectively. The limited effects on engagement then reinforced a growing skepticism among teachers and students, who became unconvinced of the approach after the somewhat chaotic International project phase. Some students considered reAct more as a 'leisure activity' rather than a learning activity and perceived relevance increased during the final stages of both pilots, when teachers delivered more traditional curriculum activities.

Context

Educational context and goals. The Italian pilot took place in a relatively strict institutional environment: the teachers' job was to prepare students for their final examinations by the end of the year, according to the formal educational quality framework for Italian high schools. ReAct was therefore organized as an extra-curricular activity, and also perceived as something 'on the side'. Without additional remuneration (for teachers) or recognition or certification (for students), commitment was low. The examination period (at the end of P2) also significantly affected interest in, and commitment for reAct. The strict curricular conditions complicated integration of the principles: there was no room to formally recognize skills like collaboration, creative thinking, or project management.

Student background and age. The participating students were relatively young (average 16 yrs), and reportedly disengaged and disinterested. First, this seemed to affect the interests proposed by them, which were considered typical for that age (football, cars, motor bikes, manga). Due to the high number of Italian participants, this affected the impression of the project of participants from other countries. Expectations and goals in international project teams were also misaligned: most

Italian students were primarily interested in social interaction, while their peers from the other participating countries were interested in creating a project or product.

Teacher experience and skills. Teachers felt unprepared for the project: they had limited skills in supporting project-based and collaborative learning, were unaware of methods to assess these activities, and unable to convincingly explain the merits and learning objectives of the approach to their students. In addition, we saw that some teachers never really took responsibility, and did not make a significant effort to participate and learn. The partner explained that teachers understood the relevance of the reAct approach, but that *"due to a lack of additional time and adequate acknowledgment (monetary), they experienced the project as a burden and not an opportunity"*.

Organizational level

The strong focus on ICT during teacher training resulted in the fact that teachers saw ICT as an objective in itself, rather than instrumental to support a particular pedagogical approach. It had the positive effect that teachers became more confident and more interested in using ICT, and some made significant efforts to reflect on their experiences, and to learn.

According to P1 teachers, their lack of commitment was due to a lack of consistent and effective support combined with a lack of confidence with ICT or the reAct pedagogical principles. Unexpectedly, the introduction of a personal tutor in the second pilot had a similar effect on commitment: without confidence to implement the reAct principles, and not impressed by the 'results' of the pilot so far, the tutor was seen as an opportunity to withdraw.

Time was often mentioned as a barrier for participation: students as well as teachers perceived to have too little time to prepare and engage with the reAct principles, for example to align personal interests and prepare a project plan. Teachers found it challenging to prepare new learning activities and integrate the principles into the curriculum within the time allocated for it.

Pedagogical Level

The use of ICT, the international element, and prospect of doing a project based on one's interest, were the main elements that initially motivated and engaged the students. However, the case clearly demonstrated that without substantive support for self-guided and collaborative project work, and limited clarity about the relevance of the activities, these relatively young students become disengaged. It was suggested that in similar restricted contexts, the reAct approach would only be feasible with an unambiguous planning of activities and outcomes. This would also entail clear guidelines and support for teachers, on how to facilitate project-based learning and collaboration.

Whereas structure and support were suggested as 'solutions' for a lack of progress during project work, 'more time' was suggested to allow students a deeper exploration of their personal interests. In both pilots, students were frustrated by the rigid planning of the international and local project phases, which forced them to move on to the next phase when they '*were just getting started*'.

Another important element, brought up by several teachers in both pilots, was that students of this age are very concerned with their (social) identity, and therefore influenced easily by their peers. Careful attention for 'influencers' is warranted, because their skepticism or negative opinion they can easily overturn students inclined to participate.

Role of ICT

There were both positive and negative experiences with regard to the use of ICT. The ICT Toolbox, which was presented using the social bookmarking tool Diigo, was not used very often, because teachers found it too complex to use, and were discouraged by the fact that most was in English. Teachers were more positive about their experiences with Google Sites, Google Hangouts, and Facebook. As mentioned, Facebook enabled teachers to get more insight into the lives, interests, and ideas of students, which facilitated their interaction with them.

Furthermore, teachers enjoyed learning something new, and some felt more confident in using ICT in their classes. They also thought that ICT motivated their students, and increased their creative skills, and supported collaboration and interaction between students and teachers. However, students pointed out that the expectation that ICT in itself motivated students was incorrect. In addition, students were not effectively working on their projects, because they were often distracted by websites like Facebook. This happened more often among students who already had a low interest in school.

Overall, the role of ICT for teaching and learning in the project appeared to be ill articulated for teachers, which explains the sometimes improvident implementation of ICT tools.

The Italian case demonstrates clearly that context is a decisive factor in the implementation of reAct. Establishing a clear overview of the context, the incentives that play a role, the formal objectives that structure the teaching process, and the skills, goals, and experiences of the participants, is essential. The next case, Greece, describes a context that was completely different and clearly more favorable for effective implementation of the reAct approach.

4.5 Greece (GR)

In Greece, both pilots were conducted at the adult training center KEK Kronos in Chalkida. The project partner was manager at this institute, and participated in the pilots as teacher training and manager.

During analysis, we sporadically used Google Translate to translate Greek texts. The following data have been collected and analyzed in the development of this case study:

Table 19 - Data Sources and Instruments (GR)

Data sources & instruments	Description
Interviews	Pre-pilot 1 preparation and context analysis interviews with the partner – 60 minutes on 8 April 2011 P1: 1 Semi-structured interview with 4 students after P1 – 15 February 2012 P2: 1 Semi-structured group interviews with 4 teachers – June 7 2012 P2: 1 Semi-structured interview with 5 students after P2 – June 2012 Post-pilot 2 partner evaluation interview transcript – 3 July 2012.
Questionnaires	Teacher questionnaires (P2) – pre-during-post. • P2 response (4/4/4) Student questionnaire (P1/P2) – pre-during-post. • P1 response (15/12/12)* • P2 response (9/9/9) After the first week of P1, 3 students quit, so all participating students responded to all questionnaires.
Artifacts & Activities	Several student projects and presentations, wiki page, and many shared teaching activities.
Teacher log books	P1: 3 teacher logbooks – 30 September, 30 October & 15 December 2011 P2: 3 teacher logbooks – 10 March, 7 April & 31 May 2012
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.
Personal notes	The partner took notes ever of the bi-weekly meetings with the teachers, and summarized those as personal reflection at the end of each pilot.
Facebook group(s) content (chat, links, discussions)	Facebook content and discussions were used for analysis, including shared videos and links, team formation and new Facebook groups, interaction and activity level.
Internet, websites	Information about the implementation context was found online: www.kek-kronos.gr

Internal communication and documentation	Basecamp discussions, shared internal documents and emails were used as data source.

4.5.1 Context

In Greece, agencies that organize continuing vocational training programs are called Vocational Training Centers (VTC) and are known under the abbreviation KEK. There are about 160 vocational training centers in Greece, which are accredited by the National Centre for the Accreditation of Vocational Training Structures and Accompanying Support Services (EKEPIS). The vocational training centers implement assessment systems based on the training curriculum; on successful completion of their courses the students receive an attendance certificate.

Most KEKs are financed by the government and follow a standardized curriculum that is established by the national government. A smaller percentage of KEKs is privately owned, and these have more freedom in designing and implementing a curriculum or approach. The reAct pilots were conducted at KEK Kronos, a private training center that offered, among other things, free courses to dropouts and minority groups that were funded by the local government and local industry.

The institutes' training programs were short-term, usually about 6 to 12 months. Its core mission was to help students develop skills and knowledge required for a job in the tourism industry or other profession. Management determined the content of courses and programs and the target groups for these courses, and then decided about number of hours, tuition fee, and teaching team. KEK Kronos only worked with certified independent teachers, who were contracted to deliver the required course or training. Hence, none of the teachers were employed fulltime or part-time by KEK Kronos, but under a temporary contract. Most programs included theoretical training and practical exercises in local firms, for which these firms were compensated.

The course of the first pilot was about tourism, and the second pilot was a course on economics and business administration. Both pilots aimed to help students to obtain qualification as well as opportunities to find employment in a course-related profession. Local organizations and businesses were involved; for example, some partner organization provided 'expert lectures', offered opportunities to be interviewed, participated in the creation of practical lessons and activities, or offered short internships.

All participating teachers were certified and reported to have experience with active learning approaches such as group activities, classroom interaction, and brainstorming techniques. Their experience with ICT was limited, but all expressed much interest to learn more about it. Teachers were aged between 30 and 55 with at least 7 years experience as a teacher. Their interest in reAct was related with the (free) teacher-training and they saw it as an opportunity for personal development

and to increase their employability. Both teachers and management demonstrated strong interest in trying out new pedagogical approaches to improve learning, but also to improve the educational services of the institute.

Teachers stated that they would like to reduce the length of lectures, and to have students who are more active, confident, enthusiastic and autonomous. In particular, they hoped that reAct would be an approach that would engage students from the first moment, help them learn to learn, grow their self-esteem and thereby improve their attitude towards learning in general. They expected that reAct would help them to explore student-centered learning: how to take students' knowledge and interests as a starting point for education. Finally, they wanted to get a better understanding of the use of ICT in education and beyond (for example for the tourist industry).

The students who participated in the first pilot were between 19 and 23 years old, and those from the second pilot were aged 23 to 25 years. Fifteen students (8 male and 7 female) started the first pilot, and nine (6 male and 3 female) with the second pilot. Five out of nine students from the second pilot were notified about the reAct program by students from pilot 1.

Most students were dropouts, and this ‘status’ seemed to affect many of them. For example, few students were open about their reasons for dropping out, and many considered the question intrusive and difficult to answer. According to the teachers, most participants had negative experiences in formal education, with low grades and negative feedback from other students and teachers, and little support at home. Students associated school and learning with deception and fear and most lacked self-confidence. They also felt stigmatized by the fact that they did not complete high school with a certificate. Students signed up for the first pilot (course), because of extrinsic pressures (being unemployed, parents) as well as intrinsic interest in becoming a professional in the tourism industry. Students from the second pilot signed up mostly because they had heard about the positive experiences of the first pilot.

About two-thirds of the students were able to articulate their interest to sign up for the course. Reasons were primarily vocation-oriented: they wished to develop in gastronomy, hospitality, or something else related with the tourism industry (P1), or in economics (P2). Yet, they were skeptical about school and its potential to change their employment situation, due to the severe structural economic problems in Greece at the time.

4.5.2 Organizational Level

The teacher-training was organized by KEK Kronos and delivered by accredited teacher trainers. At the end of the first pilot, two teachers were asked to continue their participation in the second pilot and the others were asked to share their experiences with the two ‘new’ teachers of pilot 2.

There were four sessions of four hours, which addressed the pedagogical principles of reAct and included practical activities to design the upcoming course using these principles. Also, there were activities using the ICT, but the emphasis was on pedagogy. In both pilots, the manager was frequently present to support teachers and students in class. On a daily basis, he had short chats with the teachers to discuss and resolve issues, remind them about the reAct principles, or to brainstorm about next steps. Teachers enjoyed a high level of autonomy to prepare for and execute the reAct approach.

ReAct scheduled to comprise approximately 50% of both the "Tourism" and the "Economics and Business Administration" courses, which meant that approximately 17 hours per week was spent on reAct activities, while the remaining hours (between 13-17 hours) focused on core curriculum activities and assignments. The redesign of both courses happened in close collaboration with the prospective teachers. There were 5 (morning or afternoon) sessions per week.

During the first pilot, a clear distinction between the 'regular' curriculum activities and assignments and reAct activities was drawn: two sessions per week were *focused* on 'curriculum training activities' and three sessions were *focused* on reAct activities. It meant that in 'curriculum training sessions', teachers tried to further integrate reAct principles, while they tried to link to the formal curriculum during 'reAct sessions'. Following suggestions by teachers, the distinction between reAct hours and curriculum hours was lifted in the second pilot, which enabled teachers to focus on what they considered appropriate in each session.

Both pilots were organized in a very similar way, with only minor improvements and differences in the second pilot.

4.5.3 Pedagogical Level

The implementation of the reAct approach appeared to be taking place in a welcoming context, and was well-prepared and well-organized, resulting in significant gains in terms of engagement and the development of relevant skills. The following paragraphs will describe a number of interesting experiences and details about the approach developed by the Greek partner and teachers.

Familiarization. Months before the first pilot began, and four weeks before the second pilot, prospective students were informed about the upcoming reAct project, explaining the innovative and experimental aspects of it. As mentioned in the previous section, several P1 students, who were very enthusiastic about their experience in the first pilot, had already notified five of these prospective P2 students. The familiarization was organized during two weeks (10 days) and started with an introduction of the project by the manager of the school, followed by a personal introduction of the teachers and their topics. Teachers used 'ice-breakers' to release tension and make students enthusiastic. They asked students to perform various small tasks using a selection of tools; e.g., signing up for Facebook and

create an interest-group and invite others. There were class discussions about the potential use of specific tools like YouTube for education. During this phase, teachers asked students to explore something of interest.

The schedule was flexible, and – compared to regular courses – more hours were allocated for informal discussions between teachers and students. This 'informality' had a very positive effect on the trust relationship between teachers and students, which in turn promoted a collaborative and positive attitude in class. Students felt safe to ask questions in private or in public, and to help each other (for example translating texts).

During this phase, there was some confusion about the use of ICT, which was time-consuming and had limited added value.

International project. Teachers suggested to further explore the ICT tools and to prepare, propose, promote, and execute a personally relevant project, and to prepare a presentation. All students appreciated the idea of doing a personally relevant project, which also explains the disappointment among some whose projects were 'not chosen' during the voting and team formation processes.

At the start of the international project phase of the second pilot, four students from the first pilot were invited to tell about their projects. Students were encouraged to work in teams, preferably with students from other countries, and to explore their topics beyond the school, for example by visiting the library or interviewing people. While international collaboration appeared to be too challenging, many students did venture out to explore topics out of school. Students valued the 'networking' element of the projects: they obtained a number of useful contacts, and improved their networking skills. The involvement of experts in the program motivated students and gave credibility to their projects.

About half of the students were enthusiastic about the prospect of having to collaborate internationally, the other half were unsure about their English language skills. Teachers were hardly able to support this, due to their poor English language skills, and Google Translate was considered of limited use. On the positive side: the translation task required students to discuss and collaborate in order to improve the translations, which motivated students and improved their collaboration skills. Also, some students had better English language ability than some teachers, and helped teachers use English language tools or translate messages on Facebook.

The Greek students were very motivated to show something of their region and chose topics related with it. They shared things and did projects about the Greek gastronomy, culture, and tourist attractions. Students were proud on their projects and invested additional time for translating the projects into English.

The Greek students started six projects (4 in P1 and 2 in P2), and two are included below:

- Project: Animal abandonment (P1) – At the start of the international project phase, some of the students came up with the idea for a project about animals' abandonment. Apparently, this was a topic that was close to the students' hearts, as they sometimes felt abandoned as well. Students were asked what they would like to do, and they suggested to collect personal stories, and to investigate the topic locally. They prepared a plan, consulted the teachers, and divided the tasks. For their investigation, they collected information online, but also visited a shelter for abandoned animals, and interviewed the owner. They learned about financing a shelter by means of donations and subsidies and made pictures and videos of the animals and the shelter. They made a report with all the stories in Greek, but also translated it into English using Google Translate, and shared it with the participants from the other pilots.
- Project: Gastronomy (P1) – Another student group came up with the idea of sharing local food culture and gastronomy with participants from the other countries. An additional advantage of the group's topic was that it was related to the subject matter of the course. Students made a menu, prepared food at home, made pictures of the dishes, and shared those online. Austrian students joined their group, who also shared information about their local gastronomic culture. The students structured all the information they had into a PowerPoint presentation and a Word document, and then translated it into English using Google Translator, which wasn't an obligation, but they did so out of a desire to share their work with the other participants.

In addition to many positive experiences, there were some negative remarks about this phase. Students complained about the lack of feedback: they expected that students from other countries would *also* take the effort of commenting on Facebook posts they had prepared in English. Students whose projects were 'not chosen' were disappointed in it, and most students found the voting process unclear and demotivating. As we have seen in other cases, group formation was difficult and it was suggested that more coordination was needed.

Local project. The local project was designed as one project for all, but with sub-projects to support working in groups. Roles, responsibilities, and steps were clearly described per group assignment. The assignment was to define a relevant, challenging and realistic task (for example: *'exploring the potential of tourism in a specific area'*). Students were then encouraged to explore the topic using online tools and by visiting local organizations, and to investigate employment opportunities. Industry professionals and local administrators were invited as experts to present case studies or tell about the organization they worked for. The main local project theme in the second pilot was called *"Economies of my region"*. The objective was to map, in groups, the region from an economic perspective, and focused on different industries. Students were asked to create groups and propose a projects within the established theme, resulting in one group about tourism and one about new

technologies. The students in the groups were asked to analyze the local economy related with either one of the sectors using a SWOT-analysis approach and by means of interviewing and online research. Students in each of the two groups had clearly defined tasks and responsibilities. Again, relevant people were invited as experts.

Students participated during this phase with much enthusiasm. They were engaged, committed, and a high level of collaboration was reported.

Local integration. During the final integration phase (the final four weeks in each pilot) the focus was entirely on the content of the regular curriculum. The discussions about integration, however, had already started during earlier phases. Reflection was a core part of the final integration part: students and teachers discussed their experiences and how this may be integrated further into similar programs. Activities were organized as collaborative projects and students were stimulated to continue working in a self-guided fashion. Together with the students, the teachers analyzed the local projects and how they were carried out. Additionally, teachers had personal discussions with students about their ambitions and made an effort to look for potential job opportunities for every student. Students perceived the reAct activities to be an essential part of their learning activities, and student efforts, attitudes and projects were taken into account by teachers in assessment and counted towards graduation, which was appreciated by the students.

The 'Greek approach' can be characterized by its collaborative atmosphere, informal relationships between teachers and learners, flexibility of teachers and managers, and strong support for self-guided and exploratory activities. The table below describes these pedagogical principles in more detail.

Table 20 – Pedagogical Principles (GR)

Principle	Description
Structured self-guidance	On the one hand, students enjoyed a high level of autonomy, and on the other hand, many of the activities, especially at the beginning of each phase, were clearly defined and structured to make it easy for students to participate and progress. Students were trusted to execute their projects, but it was always clear to them that there was support when needed.
Trust	There was much emphasis on creating a 'warm atmosphere' in the classroom. Teachers facilitated processes of inquiry by asking questions rather than providing answers or lessons. There was no interference with the topics of students' international projects. They approached students with an open mind and with patience, and tried to motivate and inspire them. Moreover, they involved students in the design of activities and in (educational) decisions about curriculum topics, project guidelines, and the timetable. Students indicated that they felt accepted, because their voice was heard and their interaction with teachers was more personal. Students felt more at ease, because there were fewer summative

	assessments. Instead, teachers reserved extra time for personalized feedback and formative assessment. Teachers adapted the timetable and approach to demands of the students. For example, when students asked for more support for creating effective presentations, teachers allocated one extra hour to focus on this. Also, some minor parts of the curriculum were dropped to make extra time for finishing the projects. Reversely, students gave ICT support and helped translating messages for teachers. This student-teacher interaction brought a new dynamic within the classroom.
Collaboration & Interaction	Both pilots started with a more 'competitive' approach: students felt responsible to show their peers from the other countries that "Greece" could make great projects and had beautiful things to offer, possibly as a reaction to the negative image of Greece in the news. Along the way, teachers tried to turn this competitive atmosphere into a more collaborative and participatory one by reminding students about the "Olympic spirit": participating is more important than winning. In both pilots, a highly dynamic, positive, and collaborative atmosphere was reported. Teachers also assessed collaborative activities of groups and of individual students. The Greek teachers approached team-formation and developing the group's project proposal different from the other participating teachers. Students were asked to create groups first and then propose or choose a project. This seemed to work quite well and did not have the same problems seen in other pilots with group formation. The positive atmosphere was reflected in various examples of spontaneous class collaborations to solve a specific technical problem, a translation issue, or another issue. Problems were seen as challenges that needed to be addressed collaboratively. They also accounted for peer-influence: four students from the first pilot were asked to promote the reAct project and support students in the second pilot, and in both pilots, teachers appointed 'key-students' tasked with encouraging and supporting students who were not progressing or actively involved.
Relevance	The concept of relevance caused some discussion among the teachers. Their interpretation of relevance was 'choosing one's own topic' (during the project phases). This interest-based approach was not always considered practical or even that important. According to teachers, students often changed their mind about what they thought was relevant to them. Taking students' interests as a starting point for projects should therefore be considered with caution. Some teachers thought this was not the most important principle, and considered it their responsibility to propose topics and add relevance through teaching. Students appreciated the involvement of industry professionals and administrators as 'experts', whom they could interview or informally talk with. Connecting with new people also helped them create a professional network, and the visits to organizations and other places strongly engaged them. They also appreciated the link between the local projects (and for some students even the International project) with the official

> curriculum. They considered both the project-based approach and the curriculum as useful and meaningful.
> The manager's presence also helped to add significance and importance to the project, and was highly appreciated by the students.

The role of ICT was important, but not on the foreground. Students were allowed to use any tool for their projects, but teachers made clear they would only be able to support a limited set of tools. These included desktop tools such as Microsoft Word and Powerpoint, and some online tools such as YouTube, Facebook, Google Docs, Google Translator, and Google Sites. Also, they put learning content on DVD's or USB sticks that were handed out to students, in order to allow them to watch/read the materials in their own time and spend more time in class for project work and discussions. During class hours in the ICT room, teachers reminded students frequently about the purpose of the project, implying that they should not spend their time gaming or chatting with friends.

4.5.4 Results

Both Greek pilots have been implemented in a comprehensive and consistent manner with very promising results. Students worked hard, developed skills and knowledge, were enthusiastic and generally did more than what was expected from them. Teachers adopted and embraced the reAct approach, were enthusiastic, and used their experiences with the approach in other classes.

The following paragraphs include reported outcomes and survey results that describe the effects on engagement, attitudes, and skills.

Engagement

Engagement was high, in both pilots, and during project activities as well as curriculum activities. Except for three students who disengaged from the program in the first week of the first pilot (for personal reasons), all students were actively engaged from start to end. Most students worked extra hours to finish a project or improve the final product (often a report or presentation) and much of this extra effort was done without any intervention from the teachers. Students worked on their projects outside of school approximately once or twice per week and spent about 10-15 class hours on reAct (projects).

The students were pro-active: they proposed adaptations to the timetable or program, they went to the library for more information, visited places, asked information from families and friends, did interviews with relevant experts, and prepared surveys if an interview could not be arranged.

The teachers remarked that students were, by far, more active and engaged that students in other similar groups they were teaching (in the same school). Some students described the experience as difficult but fun.

Teachers became very excited and inspired by the approach, and some decided to use their experiences with autonomy and collaboration in other classes.

As the partner put it: *"The overall impression is very positive and we think this was the best program we have ever implemented. The same we thought at the end of pilot 1 but now we think that pilot 2 was even better. The methodology was followed by all parts and the trainers followed all methodological approaches with all their heart."*

Skills and Attitudes

Students developed a variety of valuable skills, including employment and professional skills, inquiry and research skills, ICT skills, and collaboration and communication skills (such as empathy, public speaking, interviewing, and presenting). Encouraged by teachers, many students broadened the scope of their inquiry beyond Internet or the classroom resources, and visited relevant people, including potential employers, which helped them overcome a fear of approaching people, made them more confident in talking with potential employers, and helped them create a relevant network. Students also became more confident in their own skills and ability to start their own projects.

Students also developed some English language skills through the online discussions and the translation activities, which were often done collaboratively: students discussed about how to interpret a translation and how to write something in correct English.

Students were proud about their projects. Quite often, they refused to ask teachers for help, for example for translating something, because they really wanted their projects to be the result of their own actions. They also took control over the organization of projects, by dividing tasks among each other, and watching the progress within their respective groups. They were persistent and were able to overcome several obstacles (technology, language, collaboration). They also became enthusiastic about further education opportunities.

The overall quality of their work was beyond teachers' expectations. They also reported to have developed relevant skills related with self-organized learning and the use of ICT, in particular Facebook.

4.5.5 Conclusions and Reflection

The results indicate that the implementation of reAct in Greece worked out well, which explains the fact that they further integrated the approach in their teacher-

training program and in new courses.[23] Teachers effectively balanced autonomy on the one hand, and structure, support and personal feedback on the other hand. The case describes a number of effective organizational and pedagogical strategies to manage progress, collaboration, and project-based learning.

Context

The grim social and economic situation in Greece created a sense of urgency that had a positive effect on the implementation: on a national level, there was much attention for adult education and the reAct approach was considered appropriate and timely in this discussion. There was a growing number of educators in Greece who embraced principles of autonomy, creativity, and collaboration. The effect was that the participating teachers felt privileged to be able to work in such an innovative project.

On the other hand, even though free adult education seemed to provide a potential way out to unemployed youth without qualifications, economic prospects were so bad that many potential prospective students held the belief that an education (in general) would not help you get a job. Many participating students were disappointed in the government, and had little trust in the educational system to be able to tell them what would make them happy and successful. Therefore, the focus on 'taking responsibility' struck a chord with the students.

At KEK Kronos, there were only few external barriers or regulations that had to be considered, which made a flexible approach possible. On several occasions, teachers adapted the schedule and curriculum to accommodate for specific needs, with full support from management.

The teachers involved in the Greek pilots had relevant experiences, both with the target group and with active learning strategies and pedagogy. Although they had little experience in promoting self-guided learning and project-based and interest-based learning, the reAct principles were in line with their interests and they were committed to make reAct a success. Reputation was also an important driver for them.

Language was a significant barrier for international collaboration: only one teacher was relatively proficient in English, while the others did not understand much of it and were unable to assist students with the collaboration with other countries.

[23] Based on personal email communication with the partner in August 2015

The social stigma felt by many participants due to their 'dropout status' did not play a negative role in the implementation of reAct. Rather, it may even have made the approach more effective: students appreciated that teachers (and other students) listened to their opinion and that their ideas were used in the projects. Low self-esteem gradually changed into pride and a need to 'show off' or share their works with others.

Organizational Level

The manager was critical for the success of the pilot. First, because, at an early stage, he selected teachers with intrinsic interest in the approach *and* relevant previous experiences. He then made sure that teachers thoroughly understood the approach. He effectively balanced frequent and structural teacher support with autonomy to design activities, select materials, change the schedule, and define assessment criteria, to ensure teachers felt responsible. The flexible approach can be explained from this perspective (i.e. autonomy and responsibility of teachers). Finally, the manager's presence gave credibility to the course.

Teachers considered the workload to be higher than 'normal teaching', but also more rewarding, due to the positive feedback of their students. This was also the main reason for teachers to continue with the approach. In general, they were happy with the time allocated for implementation of reAct, and that there was considerable freedom for teachers to integrate the principles in the regular curriculum.

Pedagogical Level

The self-directed approach, with much personal attention and support from teachers, had a very positive effect on the students during both pilots. Students were proactive, did more work than was expected from them, and were positive, engaged, and proud on their works. The reAct approach was considered very appropriate for these students, and to adult education in general. The reported key success factors include i) the extra time to informally chat with students, ii) involvement of students in decision-making, iii) the structural support and guidance for more complex activities, iv) the relevance of the activities, v) the positive and collaborative atmosphere, and vi) the activities beyond school (interviewing, visiting places, documenting visits, etcetera).

Role of ICT

The focus in Greece was more on pedagogy than on ICT, which was clearly used as a *means* to achieve educational objectives, rather than *an educational objective* in and of itself. During the first pilot, there were some issues with logging into web services, including Facebook and there were language issues as most tools were unavailable in the Greek language (and Google Translate was not good enough). The reAct ICT Toolbox was not used anymore in the second pilot. The limited set of

tools during P2 and the fact that most were desktop tools that could be used offline was considered beneficial. Contrary to all other cases, no problems with distraction were reported. The unreliability and slow speed of the Internet was therefore less problematic than in the first pilot.

Teachers felt encouraged to explore new ICT-based educational approaches, such as *flipped classroom* using DVD recordings and USB sticks. Another interesting experience was that on some occasions, relatively simple ICT problems created opportunities for spontaneous collaboration. For example, when students tried to upload a presentation to the wiki (Google Sites), they found out that it was too large and could not be uploaded. As a result, students got together to solve the problem, and thereby reinforced the collaborative atmosphere in class.

Overall, students and teachers had limited ICT skills. Teachers appropriately focused their efforts on improving their and the students' information skills. They said that "students accepted online information without checking it, and were not used to collecting and selecting information for their projects".

The Greek case demonstrates clearly how, in the right circumstances, the reAct approach can have a strong positive impact. It also shows that some level of flexibility (provided by the manager) is needed to balance self-directed and student-centered learning with curriculum activities. The next case, Austria, describes how reAct was implemented under much different, and more restricted conditions.

4.6 Austria (AU)

The pilots in Austria were conducted at a so-called *"Berufskundlichen Hauptschulkurse"* (BHK) and were coordinated by the training institute BFI-Tirol in Innsbruck. The BHK offers courses to students who have dropped out of high school or finished without a diploma. It was funded by the "Public Employment Service Tirol" (AMS), and therefore students were able to enroll without costs.

The following data have been collected and analyzed in the development of this case study:

Table 21 - Data Sources and Instruments (AU)

Data sources & instruments	Description
Interviews	Pre-pilot 1 preparation and context analysis interviews with the partner – 45 minutes on 7 April and May 6 2011 2 Semi-structured group interviews with students (resp. 8 and 6 students) – 16 December 2011 (after P1) 1 Semi-structured group interviews (3 hours) with 3 teachers. 20 December 2011 (after P1) 1 Semi-structured group interviews with 5 teachers. 24 September 2012 (after P2) Post-pilot 2 partner evaluation interview transcript – 5 July 2012.
Questionnaires	Teacher questionnaires (P2) – pre-during-post. Lower response in second and third questionnaire due to examination period and that for 3 out of 5 teachers, employment ended by the end of June 2012 (when it was sent out). • P2 response (5/2/2) Student questionnaire (P1/P2) – pre-during-post. Unfortunately, due to issues with the questionnaire tool, responses on the first P2-questionnaire were lost. The final P2 survey was sent out to students on the final day of the year, which explains the low response. • P1 response (15/16/9) • P2 response (0/7/1)
Artifacts & Activities	Several student projects and presentations, wiki page, and many shared teaching activities. In addition, the partner introduced 'learner reports' to capture the changes in students' attitudes and skills. The partner used these reports for the pilot reports.
Teacher log books	P1: the partner filled in the logbooks in collaboration with the participating teachers: 4 logbooks during P1 – 22 September / 6 October / 19 October / 2 November 2011 P2: a summary of 5 logbooks filled in by 3 teachers
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.

Personal notes	The partner used personal notes of (informal) meetings with (other) teachers and managers for the local pilot reports.
Facebook group(s) content (chat, links, discussions)	Facebook content and discussions were used for analysis, including shared videos and links, team formation and new Facebook groups, interaction and activity level. During P2, Facebook was not used very much by the Austrian participants.
Internet, websites	Information about the implementation context was found online: http://hs-abschluss.tsn.at & http://www.bfi-tirol.at
Internal communication and documentation	Basecamp discussions, shared internal documents and emails were used as data source.

4.6.1 Context

Both pilots were conducted in the context of the *"Berufskundlicher Hauptschulkurs"* (BHK) in Innsbruck. This is a project funded by the Public Employment Service Tirol (AMS) and coordinated by the BFI-Tirol. BHK was aimed at dropouts, low-educated and unqualified youth and migrants to get a high school certificate. After graduation, additional opportunities to enter further education and professional training were offered by BFI-Tirol.

None of the participating students had yet completed high school. It was considered a highly heterogeneous group, and most students were from lower socio-economic backgrounds with limited learning support at home. Many students lacked basic learning skills, had communication deficits, concentration problems, and had a history of negative experiences in the school system. Some of the students were migrants (from the Balkan, Africa, Middle-East) with additional challenges in education: language barriers, different cultural and educational background, little social support and often without direct family or relatives, and living on a very tight budget.

The curriculum offered to these students was considered comprehensive and challenging; within 10 months, the program aimed to help students catch up sufficient knowledge and skills to obtain the regular high school diploma. They were assessed with normal exams in regular high school. About once a month, students had talks with a pedagogue about matters related with their learning and educational experience. Teachers also were supposed to have regular personal conversations with students about progress and issues in class.

About 60 students were accepted to follow this educational track in 2011, divided into four cohorts. In each of the two pilots, one cohort was followed with respectively 19 (P1) and 14 (P2) students.

The teachers involved in the pilots were chosen from a team of 10 teachers and two social workers. For the first pilot, three teachers were chosen because of their earlier

experiences with ICT, and two teachers were added to the team in the second pilot, so five teachers were involved during the second pilot. The teachers had experience with the use of ICT in class and were expected to be able to offer support to students when necessary. Almost all of them had also been working with similar groups for years. Their teaching style would be considered teacher-directed and subject-oriented.

The teachers were between 26 and 54 years old, with 3 to 30 years of teaching experience. Because of the comprehensive nature of the program, they taught a variety of topics, including Math, Physics, Biology, English, Sports, Music, History and Career Guidance.

Teachers had experienced profound disengagement among their students in former classes. They explained these disengagement problems as a result of the students' lack of learning skills and abilities, the lack of a supportive social background, and in some cases, psychological problems. They argued that only few of them possessed the 'right' attitude and skills set required to progress in school, and as a consequence, performed poorly in traditional school settings. Most of them had rather negative school experiences, whereby their initial low performance reinforced students' low self-confidence. These teachers' views on students determined to a large extent their teacher-centered approach in the whole project as will become clear in the descriptions below.

Students varied in their objectives to participate in the reAct pilots. Some showed clear commitment towards getting an accredited degree, others had very clear vocational ambitions willing to master topics leading to professions such as carpenter or retail sales manager, and some did not yet know and were there to find out.

Teachers were particularly interested in exploring ICT tools for teaching and learning. In addition, they were interested in finding out how and if the reAct principles would contribute to engagement. Their objective was to understand these principles in order to be able to apply them in both non-formal and formal educational classes as to re-engage disengaged students as well as to prevent disengagement.

Pilots one and two were conducted at the same school and three teachers participating in the first pilot continued to do so in the second pilot. Some changes to the approach were made in the second pilot based on feedback from teachers and students, including a different approach to the use of Facebook, and a stronger link of reAct activities with formal topics due to the examination period by the end of the second pilot. Teachers also decided to provide more support and structure in the students' learning activities during the international and local project phases of the second pilot.

4.6.2 Organizational Level

Well in advance of the first and second pilot, prospective teachers were approached and involved in the process of getting ready for the first pilot. Teacher-training mostly focused on exploring the ICT Toolbox; teachers were asked to pick out a few tools from the ICT Toolbox, try them, and discuss them with colleagues. The tools were linked with possible teaching and learning activities (to be designed) and topics of the formal curriculum. For the second pilot, a more reflective training was given that involved sharing experiences by the three teachers that had participated in pilot 1.

The reAct partner visited the school every two weeks, and talked with teachers about progress and issues at hand. The partner sometimes also participated during classes, clarifying objectives and helping out with organizational issues, and giving support.

Part of the school's policy was the involvement of a 'pedagogue', with whom each student had a conversation at least once a month. During these conversations, students talked about the educational experience and issues challenging them.

Four to six hours per week were scheduled for reAct activities in class and the same time was allocated for teachers to prepare themselves. Although the teachers initially organized the reAct activities as basically different from their regular teaching, they attempted to align the reAct principles and activities with the formal curriculum, and to formally assess and grade students for their reAct work.

4.6.3 Pedagogical Level

During both pilots, there was a strong involvement of teachers. The pedagogical approach was predominantly teacher-centered and the content mostly subject-oriented. Teachers primarily focused on the subjects that were part of the curriculum and final examination. Students had some control over the projects they were involved in, but less so towards the end of the second pilot, when students had to prepare for the regular exams. Most student projects, especially in the second pilot, were linked with one or more topics from the regular curriculum.

Familiarization. Student familiarization was mostly aimed at setting up the ICT infrastructure, learning how to use the laptops, installing required software, exploring tools from the ICT Toolbox, and sharing interests on Facebook among each other. The personal laptop increased student engagement (temporarily) and provided students with a 24/7 personal learning environment. Similar to the teacher training activity, students were asked to explore the ICT Toolbox, choose a tool and create a 'product' of their free choice. Many of these activities were well structured and it was explicitly outlined what students were supposed to do, but, according to the students, the overall learning objectives were not clear. The familiarization phase lasted for approximately 12 hours that were spread over several sessions during two weeks. Getting acquainted with the ICT tools and the reAct approach

took more time than expected, and it was suggested that the familiarization phase should be longer.

According to the teachers, most students lacked basic ICT skills, kept forgetting their passwords, were unable to retrieve the recovery emails, did not maintain their inbox so important messages were lost, and were generally unorganized, leading to frustration, disengagement, and limited progress. Both teachers and students had difficulties using the ICT Toolbox and exploiting its search and tag functionalities to select relevant tools. Another barrier for participation and the use of tools was that most tools were in the English language. Google Translate was also not considered good enough. Based on the experiences of the first pilot, the teachers prepared an ICT toolbox with fewer tools for the familiarization activity in the second pilot. They had a clearer view on the learning goals for this phase of familiarization and thought time was limited to let students choosing tools rather than creating a 'product'. Moreover, it would make coordination and support easier. Four tools were selected to cover the activities envisioned by the teachers: mind42, flickr, Dropbox, and a whiteboard tool.

International project. Students were asked to share their interests and create project teams with students from the other participating countries (through Facebook), which engaged all students. Once that was done, teachers asked them to prepare a project proposal of their free choice. The responsibility for organizing one's own (collaborative) project was disconcerting for many students, resulting in a loss of enthusiasm. It was also difficult for teachers: they reported to feel challenged by the fact that students were doing their own project, and to miss the overview of progress. They suggested that more structure in helping students come up with personal learning objectives would be beneficial, otherwise most students would be *'overly challenged by such an open project'*. Most student projects were considered superficial and the result of a little engagement or effort. Especially students in the first pilot would describe their project *'are for nothing but the fun of it'*, and saw little relevance in continuing with it. As a response to these experiences in the first pilot, teachers in the second pilot encouraged students to develop a proposal that was related with any of the 60 curriculum topics. The suggestion to focus on curricular topics came from the students (P1).

An example of a successful international project, from the second pilot, was *'the Folktale Project'*, which was related with the curriculum topic 'storytelling'. The learning objectives, as described by the teacher who coordinated the group, related with the concept of storytelling, ICT skills (blogging), analytical skills (comparing stories), and knowledge about a national theme or topic (part of each story). She also prepared a set of tasks for the project, which involved aggregating and sharing folk stories from Austria and beyond, and asked students to promote their project on Facebook. Several students from other countries contributed their folk stories. Furthermore, they were asked to compare the stories, and describe how these stories

related to each other and what was different between them. The teacher set up a blog and created accounts for each student in the Folktale group, so all stories could be collected and shared with others. The teacher provided support for translating messages between the Austrian and non-Austrian participants of the group. During the international presentation session, which was unanimously liked and appreciated by all attendees and participants, Spanish students made the offer to make illustrations that could be used for the stories. Both students and teacher engaged in this project and evaluated it as relevant and positive.

Teachers had mixed experiences with Facebook during the first pilot, and considered it to do more harm than good, in particular with regard to collaboration and project management. In addition, they were concerned over privacy issues, distraction, and the challenge of finding back messages and content. In the second pilot, students were encouraged to use Moodle instead of Facebook, which was better known to the teachers and was supported by the local project partner.

Local project. The local project was introduced to students when they were still working on their International projects. Teachers asked students to choose a topic from any of the 60 curriculum topics. These were primarily vocational topics, and ranged from specific ('Truck driver') to generic ('Music'). These topics included descriptions, a list of sub-topics, and materials for learning and assessment. For example, the 'Truck Driver' topic was related with topics such as road traffic, traffic safety, geography, the road network in Europe, and engines (applied chemistry and physics). The teachers developed assignments based on these choices. They offered supplementary documentation, and through discussion in class, teachers tried making the topics and activities feel relevant for students. Despite the variety of topics and freedom to choose a topic of interest, students reported a low level of ownership.

During intermediate examination period, students as well as teachers focused on preparing for exams and about half of the students did not return to their 'local projects'.

An example of the teacher-directed approach was a project called 'the Water Project' (P1). A group of students had chosen 'Water' from the list of curriculum topics, and the teacher then gave them an assignment, which involved investigating the chemical properties of acid versus base liquids and visualize that using Mind42, an online mind mapping tool, see screenshot below.

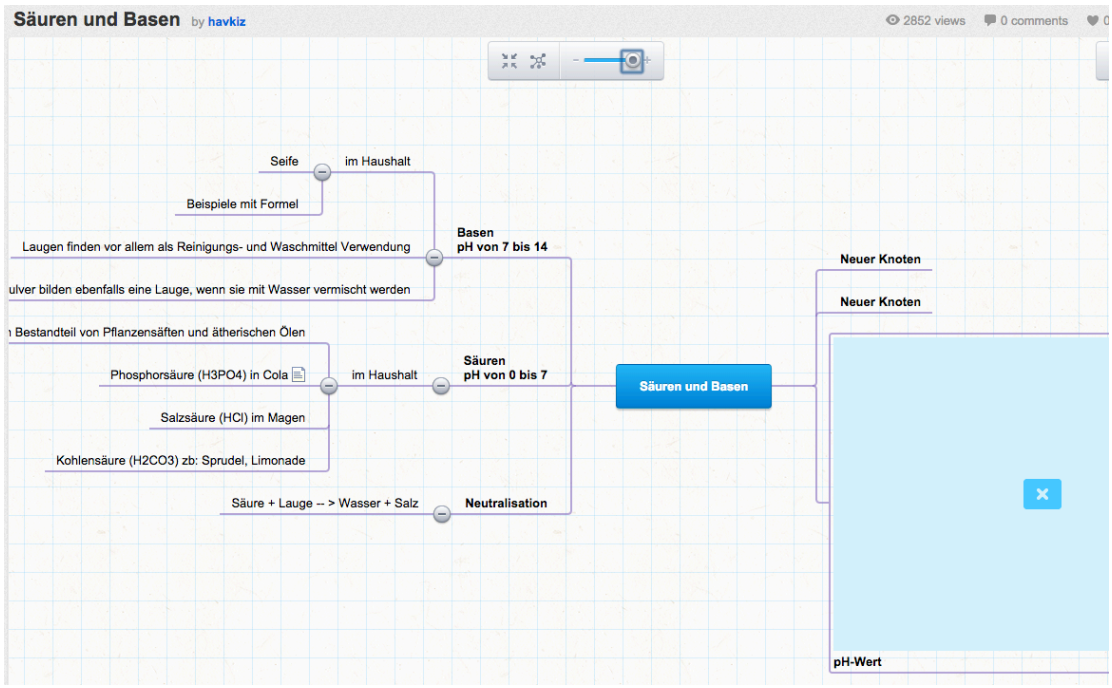

Figure 22 - Local Project Austria (pilot 1)

Due to network issues, during some reAct sessions students were suggested to use pen and paper rather than their laptop, with very positive results. Students developed their artifacts much faster, and showed better comprehension than similar sessions with the computer. One teacher explained the process as follows: *"When they are online they start with the topic and add one additional idea. Then they start to Google for images and videos. And then the difficult process to decide upon a single image, color, and sound. In order to add some content and definitions they go to Wikipedia and there is still not more than the topic and the one additional item in the mind map. When occasionally being offered paper and pencils some of the participants started to draw the mind map on the paper. And within 15 minutes they had finished the concept for their project (and later on presentation at the exam). Suddenly they did not need all the online resources any more. They started to use their own brain!"*

Local integration. During the local integration, teachers returned to the regular curriculum with the intention of integrating ICT to support teaching and creativity. At the same time, the final examination period was forthcoming, resulting in a reduced focus on reAct. Three teachers in the second pilot offered students to present their reAct work and to be graded for it, which was a very positive experience for both students and teachers. They gave students a template to prepare their presentations, such that it would comply with the criteria set by the teacher. The students became more involved, more engaged, and more pro-active knowing that their project was in fact part of the assessment. Teachers reported that it broadened their perspective on assessing students, and seriously considered to apply presentations as a method to assess in other classes they taught.

We have summarized the dominant pedagogical elements of the reAct approach in the Austrian pilots in the table below.

Table 22 - Pedagogical Principles (AU)

Principle	Description
Self-guidance	Teachers were in the lead most of the time. They provided students with clearly defined assignments. The assignments outlined the steps to follow, and sometimes specified the desired result or tool to be used. By pre-selecting a number of tools and topics, teachers reduced the number of options available for students at the start of their projects.
Relevance	During both pilots, and in particular the second pilot, there was a strong focus on discussing the relevance of topics with students. Also, all topics originated from a list of core curriculum topics, so teachers were able to include their projects and assignments into the formal examination.
Collaboration & Interaction	In both pilots, students were asked to share and present their works multiple times: during the International presentations as well as locally during classroom sessions. Also, collaboration in small groups was promoted and supported by teachers.

Teachers understood the reAct project primarily as an ICT project, exploring the potential of new ICT tools in order to engage students and support the teaching process. The students were free to choose the tool they wished to use, and a small selection of tools was promoted and supported by the teachers, including Prezi (presentation), Mind42 (mind mapping), BBC (for English learning), Strip creator, BlogSpot (blogging software) and Moodle. Different tools were explored for communication and the management of collaborative projects, including Facebook, and later on Moodle and Google Groups.

4.6.4 Results

In Austria, results were mixed, but teachers were more positive with their approach in the second pilot. Unfortunately, there were only mid-course survey responses in the second pilot, which reduced the data available for the analysis of participation and activity level down to the student interviews, teacher interviews and logbooks, and feedback from the partner.

Engagement

At the start of both pilots, students were excited and looked forward to participating in the project. The personal laptop, and the prospect of using ICT to work on their own projects contributed to the overall engagement during this phase.

After this initial burst of activity, students became less interested and engaged in participating in reAct. This was more pronounced during the first pilot. Students questioned the relevance of the project. Some students had only posted a video on Facebook, or collected a few videos in a YouTube channel. Teachers changed focus from personal, interest-based projects to activities more related with the curriculum. Halfway into the first pilot, 75% of the students indicated to have been actively participating, and less than half considered themselves active by the end of the pilot. The main reasons for this decrease in interest were: uninteresting activities, too difficult, lack of time, or problems at home.

The second pilot was, according to the teachers, more successful in terms of student engagement. Students from the Folktale group and those students whose projects were going to be part of the formal assessment, kept their engagement throughout the second pilot. Activity on Facebook, despite being discouraged by teachers, also increased. However, the other students (approximately half of the cohort) lost interest and focused primarily on the formal topics that were leading to certification. Similar to the first pilot, less than half of the students actively participated until the end of the second pilot.

Teachers remained focused on reAct throughout both pilots, except during examination periods (as the students), when they had to prepare, and sometimes conduct, exams. Because most of the activities were directly linked with the curriculum, they felt they were not doing something extra, but considered it part of the regular teaching.

Skills and Attitudes

In the context of the reAct pilots, teachers supported the planned activities such as preparing and giving a presentation (presentation skills), project-based learning, working in teams (collaboration) and using ICT and the Internet for doing research. In the first pilot, students responded neutral to positive on statements addressing perceived benefits regarding communication skills and self-confidence, and positive with regard to effects on employability and how the project helped them prepare for an internship. The focus on preparing students for a job and giving them 'one last opportunity' to get a degree can be seen in this student comment: *"This course is for me of a very big importance since I know that this is my last chance for a successful future, meaning a position as an apprentice or studies. [] The teachers are qualified and prepare us well on a future work. I thank you for it."* According to the teachers, few students seemed to have benefited from the autonomy given to them, while most of them required more support and guidance in designing and structuring their own activities. Another comment by a student confirms this: *"I value this course very much because it represents a great chance for me. But some people absolutely don't think in the same way here and I find this not only outrageous but also very childish..."*

For the second pilot, students were positive to very positive about the value of reAct in terms of 'preparing for an internship', 'developing communication skills', and 'improved confidence'. The increase in confidence was particularly noted among the students in the Folktales group.

The participating teachers were very positive about their experiences in the pilot, despite the difficulties during the International projects, and the additional workload. They perceived reAct to be especially valuable in terms of augmenting their ICT skills and learning new, more creative tools that can be used in education. They described to have learned from both the positive and negative experiences with Facebook, and developed a better understanding of the potential and risks associated with Facebook or other social media in education. Their experiences with self-guidance and collaboration resulted in a new pedagogical and assessment approach. They valued more autonomy for students in choosing and interpreting the exam topic, turning the choice into a project or assignment, and assessing students through a presentation, rather than written exam.

4.6.5 Conclusions and Reflection

The implementation of the pilots at BHK can be characterized by the relatively high level of control of teachers, and hence the limited autonomy and ownership given to the students. Rather than focusing on autonomy and ownership, the teachers involved appreciated and interpreted reAct as a project focusing on the use of ICT in the classroom, and on *'group learning and learning in an international context'*. This view on the reAct project together with their view on their students created a pedagogy that was more teacher-led.

Teachers considered the first pilot as disappointing. The language barrier, limited ICT skills of students, and the lack of support for (international) projects frustrated students and teachers. As a consequence, a more structured approach with less student-autonomy was implemented in the second pilot. This approach can be described as controlled autonomy, whereby the teachers predetermined many of the steps and choices. For example, during the Familiarization phase, the exercises allowed students to choose a tool, but only a very limited set of tools was provided to them. Similarly, when choosing a topic for their own projects, students had to choose from a list of topics provided by the institution, to enable better integration with the curriculum. Still, the highest engagement was reported among students who participated in the most successful (international) project during this pilot, which was characterized by principles such as ownership, creativity, and collaboration. Most other activities did not engage students as much, and students participated in a more passive way.

Finally, as there were only about four to six hours per week allocated for reAct activities, leaving limited time for students (and teachers) to explore, wonder, and

experiment, and to develop a profound engagement with a self-chosen topic, teachers implemented the more controlled approach.

Context

The Austrian pilot took place within a training institute that offered an alternative curriculum that helped 15-18 year olds without any qualification obtain a certification. The following factors seemed to have influenced the implementation and results of the pilot.

Educational context and goals. Ultimately, students were supposed to reach a level that would allow them to obtain the formal high school diploma, which required a more subject-oriented approach under strict guidance of the teachers. ReAct was not an essential or core activity, neither for teachers or students, so external motivations and obligations, such as the final exams, often interfered with participation and engagement.

Limited experience and time. It was a challenge to explore and understand concepts of ownership and project-based learning with the limited time available and lack of relevant skills and training. Frequently, when students were not productive or engaged, teachers then returned to more structured, teacher-led activities.

Student background and age. The participating classes were considered very diverse in terms of culture and background. There were a number of recent immigrants who were proficient neither in the Austrian language nor in English. This made it difficult to discuss reAct with students and to facilitate local or international collaboration. Many students had difficult home situations and other obligations that interfered with school. According to the teachers, the majority of students *'did not have the appropriate level and background to introduce reAct'*.

Organizational Level

The local partner approached participating teachers more than one month before the start of each pilot, and during the pilot, teachers were provided with appropriate time and support for developing and implementing learning activities. The strong focus on ICT during teacher training resulted in the fact that teachers saw ICT as an objective in itself, rather than instrumental to support certain types of learning. Teachers in the second pilot experienced much support from the teachers who had the experience of participating in the first pilot. However, overall there was a need for better coordination between teachers, as many were unaware of progress made during previous reAct sessions. The lack of coordination also affected the limited impact and results during the international project phase. Difficulties of team formation and collaboration were further amplified by language barriers and limited collaboration and project management skills.

Pedagogical Level

The novelty of the approach appealed to students, who were instantly attracted by reAct, not just because of its approach and elements, but because the students felt treated differently and they were expected to do things they had not done before. Initially, students were not hampered by communication issues or language barriers, but were motivated to try out all new possibilities of the approach.

Austria has been a unique case in the sense that its approach, to a large degree, was teacher-led and highly structured, especially after the first pilot. Teachers understood project-based learning as an approach whereby they set the objectives and defined the steps, and students were responsible for executing those steps in a relatively autonomous way. Paradoxically, one of the more engaging student projects was the Folktale project, which integrated many of the reAct principles. It even linked with the formal curriculum, which was clearly appreciated by the students, many of whom were frustrated by the lack of clear (learning) objectives and clarity of reAct activities. A perceived lack of relevance (reAct was 'just for the fun of it') clearly discouraged students from participating. At the same time, reducing choice and adding structure did necessarily increase engagement, and although active and progressing in their projects, most students would remain subliminally involved and demonstrated little proactive behavior. This shows the relative delicate balance between conforming to external criteria and regulations on the one hand, and students' interests and abilities on the other hand, all in the context of the teachers' own beliefs and skills to facilitate such a process, reflected in the illustration below.

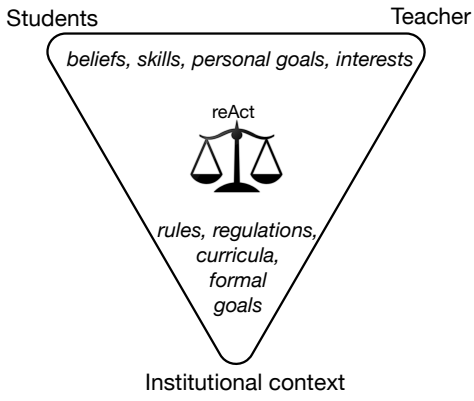

Figure 23 - reAct as Balancing Act

Another notion was the relative lack of time: more time was required to allow students to get accustomed to the idea of organizing one's own project. Four hours per week seemed insufficient, taking into consideration all the other obligations students had.

Relative to other cases, there was much attention to integration of reAct within the regular curriculum. On a positive side, this allowed teachers to reuse content

available to them (from the institutions' repository) and to use their knowledge of the chosen topics to facilitate and support students, control progress, and even include these activities in the formal assessment. Rather than facilitating students to develop a personally relevant project and to assist them to complete their own tasks, teachers created these tasks and made sure students completed those in a rather autonomous fashion, at the cost of their sense of ownership over the final 'product'. It is therefore questionable whether these grades were additional 'extrinsic' incentives for students who were already intrinsically motivated, or that these grades were the only incentives.

Role of ICT

The experiences with ICT to support reAct were positive as well as negative. On a positive note, one teacher commented about the use of ICT tools in education: *"To the fullest extent reAct only may be integrated well when in all classrooms laptop or PCs, at least, are present. It makes a significant difference to the autonomy and self-determination of the learners as well as to the creative design options that in the classroom all resources are present, or if the whole group has to go to the computer room first."* Students were clearly happy with their personal laptop, which they considered not just as a tool for education, but also as a 'token of trust' from the institute. The international presentations using Google Hangouts were also appreciated very much, as students demonstrated a clear desire to see who was on the other side, and not just read their posts on Facebook. To overcome initial barriers and issues of trust, it was suggested (after the second pilot) to introduce video-conferencing at start. Another suggestion concerned the use of a team-management tool to coordinate activities to address frustrations among students concerning the lack of feedback from other participants.

Few examples were reported that demonstrated benefits of ICT to creativity, ownership or other reAct principles. Some teachers saw reAct as an extension of their earlier experiences with ICT in the classroom. For example, one teacher explained: *"As it is, I am using Moodle since 2005 and I am really convinced, it's very good to structure and organize learning as well as for collaborating. Of course it's a lot of work beforehand to plan how to use the available activities in Moodle, to motivate the students for collaboration, but it's worth the effort."* These early experiences with Moodle, which is a traditional LMS, may have hampered the adoption of newer tools. Often, there were complaints about a certain tool or environment and Moodle was described as the solution to many of these complaints. In the second pilot, teachers decided that students would not use Facebook anymore, and suggested to use Moodle for their own projects.

The lack of basic ICT skills (in particular students), distraction from social media websites, and the limited amount of useful tools available in the student-preferred languages were other important factors with regard to the adoption and use of ICT

to facilitate reAct in similar contexts. Under such circumstances, as described in section 4.6.2, it can be a wise strategy to reduce options to students and to offer them nothing more than pencil and paper.

Whereas this case study demonstrated an approach characterized by restrictions, limited options for students, and a focus on curricular topics, a completely different approach can be read in the next chapter about MIX Academy, the first pilot in the Netherlands.

4.7 The Netherlands – First Pilot (NL1)

The first pilot in the Netherlands was conducted at MIX Academy, a small art institute in the center of Amsterdam. Because the second pilot was conducted in a completely different context, the two pilots were described as two individual case studies. Table 16 describes the data sources and instruments used for the analysis of this pilot.

Table 23 - Data Sources and Instruments (NL1)

Data sources & instruments	Description
Interviews	Pre-pilot open interview with the principle about the school, its pedagogical approach, and effects on students. 70 minutes – 22 February 2011 Post-pilot semi-structured interview with principle/head teacher about the experiences with reAct, and more general, its pedagogical approach, and future plans regarding curriculum and approach. Successes and failures. 40 minutes – 23 February 2012 Post-pilot semi-structured group interview with four students, reflecting on reAct and on the MIX pedagogy. 50 minutes – 23 February 2012. 48 minutes. Reflecting on MIX approach, on 'reflection day', positive and negative things of the MIX Academy and approach.
Questionnaires	Student questionnaire (P1/P2) – pre-during-post. • P1 response (10/8/2)
Artifacts & Activities	Several student projects and presentations, website, and the teaching activities shared by the principle and the students. Pictures were taken from class sessions and during several visits.
Teacher log books	4 logbooks – 26 September, 13 October, 24 November 2011 and 10 February 2012.
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.
Personal notes	We took notes of every online and face-to-face meeting with the principle and other teachers.
Facebook content (links, discussions)	Students were active on Facebook, but less active on the reAct international page.
Internet, websites	The MIX Academy website was a rich data source, containing descriptions of workshops, students art work, teacher profiles, and the philosophies and ideas underpinning 'the MIX approach'. The website was maintained by the principle as well as a team of students: www.mixacademy.nl
Internal	Basecamp discussions, shared internal documents and emails were

communication and documentation	used as data source.
Personal communication	We had extensive contact with the principle, one teacher, and some students. The email communications as well as telephone conversations were important data sources.
Observations	Three class sessions were observed.

4.7.1 Context

MIX Academy, founded in 1996, was a private art and design academy located in the center of Amsterdam. Rather than just transferring knowledge, its objective was to let students explore their identity through art and design. They had significant experience with at-risk youth and an appropriate pedagogical approach in line with reAct. In fact, the initial design of the reAct approach was influenced by our conversations with the school's principle. The expectation was that MIX Academy, and its principle, could therefore play a leading or exemplary role during the first pilot. Moreover, by looking at MIX Academy closely, we would be able to see the practical implementation of reAct principles by teachers who had been using such an approach for years.

MIX Academy was aimed at anyone between 18 and 32 years old with an interest in creativity and art. Because there were no formal entry requirements, it attracted many students without formal qualifications. These students also expressed, implicitly or explicitly, a desire to explore their identity and to find meaning in life. Becoming a professional artist or designer was considered as important as finding one's 'true self'.

The school was an independent school and had no formal affiliations with other schools. It was run as a private institute and thus it was not subject to governmental regulations for education. Neither was it eligible for government funding; its expenses were completely covered by the students' tuition fees, which amounted up to €4000 per year. It was located in a building with many small startups in the creative industry. It occupied one large studio with high ceilings, various tables and chairs grouped together to facilitate collaboration. It contained a collection of paintings, photos, installations, statues and other art, created by the students as well as the teachers.

The core teaching team was small (3-4 teachers aged between 33 and 55) who organized and delivered the core program. In addition, professionals with different backgrounds and careers organized weekly workshops. Students were involved in the choice for workshop topics and professionals.

The curriculum was developed by MIX Academy itself, and included relevant online content and a small number of seminal books about art and art history. The first year was exploratory, with lectures and workshops in a variety of disciplines,

including painting, sculpture, illustrative art, web-design, photography and media. During the second and third year, students were supposed to profoundly explore a limited number of disciplines or topics. In the third year, they were also supposed to publish their work online and in exhibitions, improve their portfolio, do an internship, and prepare for their career. Increasing students' capacity and skills to enable them to find employment or generate their own income and work as soon as they graduated from MIX Academy was a major challenge for the teachers. A more 'entrepreneurial' pedagogical approach was introduced to the students, primarily focused on students' ability to communicate, connect, network and create value, rather than making them rely on a diploma.

During this pilot, we followed a group of about 15 students aged 18 to 25 in their first and second year. Nearly all students indicated to have negative experiences in formal education and about half of the students had dropped out. They expected MIX Academy to be a place where they would develop art and design skills and to be able to explore their own talents and interests. They were rather diverse in age, background, and motivation. There were the students with limited self-confidence and without any clear purpose or goals for life. To them, MIX was a place to explore their identity, and art and design were the instruments to do that. On the other hand, there were students whose primary interest and goal was to become professional artist or designer. Although all students were very serious about education, meeting the learning goals of these different groups was considered another major pedagogical challenge.

All students shared the same studio, as a way to facilitate collaboration and peer-based learning. Interestingly, all students possessed a key to the building, and they were allowed to access it at any time, including weekends and nights. Furthermore, students shared responsibility for maintaining and paying for the school's main resources, paint, drawing and printing paper, pencils and other classroom materials required. Hence, students had to decide what resources to buy and had to collect money to acquire the necessary resources. Students were required to bring their own laptops, and in addition there were a few desktop computers, one high-end computer and dedicated software, and a high-end camera.

4.7.2 Organizational Level

The principle offered a short (less than 1 hour) teacher training for invited workshop teachers, focused on the teacher's role as a facilitator. Some of these teachers were former MIX students, and were comfortable with the approach, but many were professionals without teaching experience or training. Furthermore, he would sometimes attend workshop sessions to support students and the teacher.

Education at MIX Academy was organized with limited organizational resources, as indicated in the previous section. The majority of the budget was spent on rent and

hiring the teachers. There was no money left for 'organization', implying such things as human resource management, marketing, and quality assurance.

4.7.3 Pedagogical Level

As described before, MIX Academy was chosen for its relevant pedagogical approach, and their potentially leading role in the project. The principle had proposed that he, and his students, could mentor other students with respect to the creative learning process and pedagogy. They would do so by sharing their art works and designs on Facebook and connect with students from other pilots, and to reflect on the excursions online. They were used to do this for the MIX website, so this was not supposed to be something new or extra.

Except for a few posts on Facebook and an email by the principle, no interaction emerged between the MIX students and the other participants of reAct. One of the reasons was that MIX students felt disconnected with the other students, whom they had never seen and appeared to be less serious about education. This was based on the Facebook activity, which, at the time, was dominated by the (relatively young) Italian highschool students. The other participants appeared to be much younger, and with a different, less serious mindset, than the MIX students.

Because MIX Academy did not follow the same phases that characterized the pilots in the other participating countries, we do not use that structure here. We do, however, try to give an overview of the learning experience of first- and second-year MIX Academy students. A more detailed description of the learning experience and pedagogical principles at MIX Academy follows here.

Personal intake (corresponding to: Familiarization). During a personal intake conversation with the principle, student and principle discuss the student's portfolio, interests and goals for the coming year. Also, the responsibilities and high level of self-guidance were made clear to prospective MIX students before they started the program. The personal intake made students feel 'accepted' to the institute and made them aware of their responsibilities with regard to the learning process. Still, it seemed too limited for more than half of the students, who did not really know what was expected from them. This feeling was amplified when the program introduced new elements or changed existing elements, which happened several times and was a deliberate component of the approach. The principle wanted students to, at least partially, structure and design the learning experience, and he himself saw the program as a never-ending experiment, and frequently proposed new elements and refining the existing approach those all the time. Students voiced complaints about their role in maintaining the artistic resources (such as paint), and felt unsupported for giving peer-support effectively.

Earning while Learning. Part of the MIX curriculum was an element called 'Earning while learning', which entailed various 'paid' learning activities, including exhibitions, an online shop, paid internships, and client projects. In the period we

followed the educational process of MIX Academy, we have seen approximately eight successful projects of this kind, including decoration of walls of a municipal agency, a gallery, video installation during a documentary festival, and selling art works during a charity dinner.

Excursions. Every week, excursions were organized to museums or to places in Amsterdam worth visiting. Students were supposed to work in groups and develop their personal projects based on their experiences on the street or elsewhere. They were supposed to interview people or mingle with professionals. One of these excursions was the following trip, which aimed to raise awareness of the concept of (personal) branding. At the time of the pilot (2011-2012), a global bottom-up protest movement called 'Occupy' emerged as a response to the negative impacts of capitalism. So too in Amsterdam, and the 'branding trip' went to one of their manifestations, very near the school. Students were asked to explore discover what the protesters wanted to accomplish and how they 'branded' themselves. Then, the teacher invited the students into a luxury warehouse next door, and the activity was repeated: what do these brands portray, and how do they do it? Back at school, students discussed their impressions and talked about brands and branding, successful branding, and how to create an (artistic) identity that lasts. The learning objective was that students developed a personal framework of understanding of the concept of branding (recognition, consistency, etc.) that would guide them in developing a marketable identity.

Reflection day (corresponding to: Local Integration). At the end of the pilot, the principle invited the students to provide suggestions to improve the MIX education, and in particular reflect on the new elements "Earning while learning" and "Peer-based learning". Students were informed that an entire day would be reserved for reflection and design activities, and were asked to prepare that day together. They were given time to discuss issues, without any of the teachers present, and to present these issues and new ideas during the proposed day. Students suggested a more structured approach with more frequent instructor presence, guidance and feedback. There was also a demand for the use of formal assessment criteria and frameworks to assess their knowledge and skills, for two reasons: first, they felt these frameworks gave credibility to their learning efforts and would offer more structure to it, and secondly, the transition to formal art education would be easier. Finally, rules were suggested that would ensure presence of all students during the sessions, as some students were frustrated by the fact that some students frequently did not show up, or came too late to sessions. After the reflection, the teachers discussed their feedback, and came up with a new plan that integrated their suggestions and ideas. At the time, it was considered a difficult session, but soon afterwards, the participants came to appreciate the experience. Students realized that they had successfully changed the learning environment, and the teachers

appreciated the students' abilities to reflect on the learning process, and to communicate their concerns clearly.

In addition to the annual reflection days, teachers introduced several shorter reflection moments for students. Students appreciated the fact that their critique played a role in the (re)design of the program and came to see their education as a process they could influence. The process itself was also considered very engaging, with hotly debated topics regarding school rules or curriculum content.

Assessing students. MIX Academy had developed an assessment framework with the following categories: i) Mentality & Motivation; ii) Exploration & Analysis; iii) Effort; iv) Pace of production; v) Skills & understanding. Each student received personalized feedback, rather than grades, which was against the school's philosophy. More important were 'developing a personal brand' and a high quality portfolio. Students were also encouraged to get to know professionals and to develop their professional network. The organization of the annual exhibition (see Figure 24) was another, implicit part of evaluation: if students aspired to be professional artists or designers, they needed to sell their works; organizing exhibitions was a way to test the demand and interest for their works.

Figure 24 - The principle Ralph de Lange explains two of his students what he likes about Angelina Jolie

At least once a week, students got together to give each other feedback and ask each other questions, facilitated by one of the teachers. They used the Terry Barrett method (Barrett, 1994) for this; a structured method to interpret and talk about art.

Students had to 'defend' their work and explain its (personal) significance to the other students, which improved their communication skills.

The high diversity of students and limited resources and time to cater to each individual student's requests and needs was considered challenging. The principle therefore introduced peer-based learning and peer-assessment, but there was limited support for this, other than the decision to co-locate students from different cohorts into one (large) studio.

Limiting choice. One of the strategies teachers adopted to promote progress, was to limit the creative options available to students, e.g. reducing the available colors for a painting to one or two, or by letting them choose only one topic or instrument to be used in their creative expression. *"Making art"*, according to the principle, *"is making choices"* and *"discovering the reasoning behind these choices is an important part of the learning process"*. The colors students choose for their paintings, the topic of a photography project, their preferred discipline, the use of a specific tool, and other choices are the basis of the self-exploration and discovery process. Students received personalized suggestions and support, based on their creative work. The art 'product' was not the end of learning, it was the beginning, because students had to explain and defend their choices to the teachers and one another. Teachers facilitated this process, which can be illustrated by the following excerpt from an interview with the principle.

"If I'd ask you, 'shall we be creative?'
The student will say 'I'm not creative'.
'Well, let's start then. Here you have a photo camera and a dark room to develop the pictures. You don't have to draw or paint. Never, if you don't want to.'
And then the student says 'Phew. Ok, let's make some pictures.'
So we give the student an analog camera, with only 1 film. That film means 24 choices. If you give them a digital camera, they have a thousand choices. The moment you take a picture, you make a choice. Those choices combined say a lot about you. You can analyze those. You put all those pictures together, and you can tell if someone is a very structured kind of person, or you identify interest or style, very minimalistic or very naturalistic. If your pictures show only living things, maybe you find industrial things less interesting.
And, together with other students or teachers, we then search for the pictures that are interesting, both in substance and technique. Then we further select pictures until there are about three that tell a lot about the artist behind the camera, his or her choices. If he or she then agrees with the explanation, then you have found something essential, something that touches the student from within and which reaches his or her personal interest and ideas.
Students experience this awareness as a personal strength, a particular quality, which you then take as a starting point for better and more meaningful pictures. And using this as a method to research one's own identity."

Figure 25 – Choice and creativity

The personal significance of a student's creative work was analyzed as well as its technical value, societal relevance and potential market value.

MIX Academy was chosen as a pilot context, because of its interesting pedagogical approach, which also partially inspired the original reAct approach. The table below describes its core pedagogical principles.

Table 24 – Pedagogical Principles (NL1)

Principle	Description
Creativity	Creativity and creative learning was central to the MIX approach. Creativity was a goal in itself, as explained earlier, and as an instrument in a process of discovery.
Self-guidance	The MIX Academy principle and main teachers combined classroom activities and subject-oriented teaching with project-based, experiential, and self-directed learning approaches. Second- and third-year students were supposed to work more autonomously, come up with ideas and projects, and self-organize the learning activities (establishing learning goals, planning). Attendance at sessions and workshops was not obligatory, but expected, especially for first-year students. Students questioned the high level of autonomy and responsibility and proposed a more instructive approach in relation to developing specific skills (i.e. drawing, sculpture, and others) in order to 'learn more effectively'. Moreover, it was suggested to better connect workshop activities and content with the rest of the program. At the same time, the significant autonomy and time to explore seemed necessary to come to 'true self', which was defined as an understanding of one's identity. For instance, one student, after weeks of mindlessly participating in activities, came to the insight that he could combine two of his main interests, which were illustrative art and music. His personal focus, from that moment on was to make illustrations for musical albums. This was not a unique case, on the contrary: all interviewed students seemed to have similar experiences as a result of the significant freedom and time to explore. When students became disengaged, rather than pushing students to cooperate and become active, teachers showed patience and inquired about their interests to stimulate their thinking. Students were explained that disengagement, frustration, and emptiness are all part of the creative learning process. Their disinterest or disengagement was considered a signal that a student was searching for something (more) meaningful, which, they argued, is a sensitive period that should not be interfered with too much. As one teacher explains: *"When a student decides not to participate in a project or assignment, we let him, but ensure that the student is present and watches the other students perform and participate actively. Almost always, this increases the desire of the student to participate as well, or start a personal project."*
Ownership	Students were involved in the organization of the school as a preparation for running their own art or design business. They were responsible for the school's day-to-day tasks, including answering the phone, opening the door, cleaning the room, and maintaining the resources such as paint and printing paper. They were responsible for collecting the necessary money to be able to purchase these resources. There was a team of web-editors responsible for

	maintaining and updating the website with blog posts about workshops, pictures of student art, promoting events, etc. Also, students organized events (exhibitions and parties) and some were involved in acquisition, business development and marketing (attracting new students). All students possessed a key to the school. Students were further encouraged to provide suggestions for new workshops and topics to be addressed by the main program and the earlier mentioned annual reflection day was another element to enhance student ownership of the educational process.
Relevance	Artists, designers, and other professionals (including a philosopher) with a potentially meaningful contribution to the program were invited to organize a workshop program. The workshops were organized every Tuesday and the programs usually consisted of 4 to 7 sessions. These invited teachers introduced the students to the discipline, explained about the industry they work in, and taught specific techniques. Although students liked to interact with professionals on a weekly basis, asking questions about a possible future career, they missed integration with the main program (the principle thought this was something students had to do). They also criticized the teaching quality of some of the teachers, many of whom had little to no teaching experience. The principle explained that the MIX approach was not easily conveyed to invited teachers. Amsterdam, its architecture, public spaces, museums, and even its inhabitants were considered part of the learning environment. Almost every week, teachers and students organized an excursion, visit, or field trip; students visited museums, galleries, and networking events, explored the city's architecture, observed people in the park or street, or went to other places to investigate or get inspired. Students appreciated the interactive assignments, such as taking an interview that required them to go out and interact with other people.
Collaboration & Interaction	There was a strong focus on collaboration, discussion, peer-based learning and reflection activities. There were collaborative assignments, such as preparing a presentation together or organizing an exhibition. Client projects also required students to work together and the student involvement in the organization of MIX was also inherently collaborative. Teachers noted that strong engagement with one's own project (and topic) often was at the cost of interest in other students' projects and topics. The collaborative reflection sessions were effective and considered meaningful. It helped students overcome fears of talking about their art projects and designs and repetition increased their communication skills and confidence. On the other hand, the mentoring and peer-assessment was not effective due to the limited support and guidance for it. The shared space facilitated frequent ad-hoc collaborations and discussions (i.e. suggestions about the type of paint to use, a composition of colors, or technical features of a computer program). During reflection day, students suggested rules for presence to enhance collaboration: students would not be able to join the morning session after 9.30am or the afternoon session after 1pm. They also expressed the need for a quiet, less chaotic environment to work alone or with others.

There was no ICT strategy, but ICT was an integrated element of the approach. ICT was used whenever appropriate or required for a certain discipline. For example, students were supposed to learn various design programs, such as InDesign or Photoshop, and email was used for sharing class notes, upcoming activities and deadlines, administrative issues, discussions, personal and group feedback, homework, and planning. During class, teachers often referred to online resources and showed videos on Vimeo and YouTube to provide (inspirational or educational) examples of the theory being discussed. Students used Facebook as a social tool *and* as a professional tool: to promote MIX Academy or their own art works and to connect with established artists. Even, a web-shop was made using Facebook to sell student art works. The school's website was maintained by a team of student editors and the principle. It contained descriptions about the school, its students and teachers, as well as blog posts about excursions and class sessions.

4.7.4 Results

The MIX Academy pilot was different from the other pilots, as explained earlier. We therefore cannot speak of results in relation to *the reAct approach*, rather results in relation to the *MIX approach*, while it has to be understood that these are fundamentally similar. Moreover, the objective of following MIX Academy during the first pilot was less about testing the impact of reAct in a traditional environment, rather to describe the practical implementation of its principles by teachers experienced with the approach.

Engagement

During the pilot, we saw an increase in engagement and activity level, in particular the first-year students, and a drop in activity and engagement towards the end of the pilot.

Most students valued the autonomy to explore one's own interests and personal learning goals, and the relative freedom to go through the program at their own pace. On the other hand, the lack of structure and support from teachers frustrated some students. Teachers argued that these moments of frustration were useful learning experiences, because students were then required to ask themselves fundamental questions about their interests and ambitions. The usefulness of such periods was confirmed by all interviewed students, who said they themselves had experienced such a period, which was always followed by a very productive, focused, and motivated period.

The perceived lack of transparency with regard to 'earning while learning', such as issues of property rights and the distribution of earnings, towards the end of the first pilot and later were detrimental to the overall atmosphere and trust level, and thereby students' participation and engagement.[24]

Skills & Attitudes

About half of the students (especially first and second-year students) had the opinion that a more structured approach would have helped them progress more. Apparently, the workshops were not well integrated into the program, and students perceived the overall program to be incoherent and sometimes redundant. On the other hand, they did improve skills in various art and design disciplines, collaboration skills, and developed a changed, more confident attitude. Five first-year students developed enough passion and talent to be admitted to highly ranked art schools in the Netherlands, including Rietveld Academy and Willem de Koning (both schools have a strict admission procedure).

The collaborative reflection sessions were considered difficult. During these sessions, students were asked to talk openly about their art or designs, interests, and ideas, in front of the others, and were aimed to move them out of their comfort zone. Because all students had to do this, following a structured approach, they improved their abilities to communicate art, improved their own understanding of their own art works, and the appreciation of the art works of the other students. It made them more self-confident and it lowered barriers to interact and collaborate with others. The continuous and repeated reflection sessions (personal and in groups) were regarded as a very meaningful.

The frequent research assignments (interviewing people on the street), and social excursions (networking sessions) stimulated students to develop their communication and networking skills. Their involvement in co-creating the learning environment made students more aware of their role in the learning process, more critical and confident enough to voice their opinion or suggest ideas. They demonstrated an ability to identify and explain issues that bothered them and to express how they wanted to be taught.

4.7.5 Conclusions and Reflection

The pilot gave insight into the practice of self-organized learning environment and its potential and limitations. Although students often experienced the learning

[24] After pilot 1, we visited MIX Academy and communicated with its principle and some teachers several times. The data collection period was not confined to the pilot period.

process and autonomy as frustrating, it also forced them to take control, leading to very positive outcomes: students improved their organizational skills, communication skills, and self-confidence and developed an entrepreneurial attitude.

Context

For over a decade, MIX Academy had developed and practiced a pedagogical approach that was very relevant in the context of the reAct project. It was a complex and multi-faceted approach that, on the one hand, took advantage of its context, and at the same time, was conditioned by the same factors. As an independent school, it was not subject to formal educational restrictions or regulations. Its niche in the educational 'market' was to target students who felt they did not belong in a formal educational system. The lack of formal regulations made it possible to experiment and develop a unique educational approach that stretched the concept of self-organized learning and focused on actual student demands rather than external criteria. However, it also *did not demand* external or internal quality mechanisms, which seemed to have influenced the way students perceived of the school. They frequently complained about the fact that there was no 'official' recognition. Moreover, there was no culture of evaluation, and experiments and new elements were introduced without a clear strategy to measure its effectiveness. Finally, the school was therefore unable to apply for funding, which made it more difficult to make ends meet and compete with accredited institutions.

The diversity of students, in terms of abilities, intelligence level, background, and motivation, was a challenge for teachers. Many of the first- and second-year students found it difficult to cope with all the responsibilities and freedom. As a result, and based on student feedback, more structure and more rules were introduced.

Organizational Level

One of the organizational challenges was related with the integration of the workshops into the program, and the challenge to transfer the pedagogical approach to invited teachers and professionals. A more significant organizational problem was the limited organizational, financial, and human resources that are required to run a school effectively. The involvement of students in the organization and day-to-day tasks as well as 'earning while learning' were organizational and pedagogical 'features', but did not help to alleviate this problem. Our experiences with MIX Academy during and after the pilot demonstrated the significant challenge of running an independent school aimed at young adults with negative experiences with formal education. The tuition fee was, for private education, relatively low, but many participants still considered this an important barrier.

When students left with a clear plan and prospects (e.g. to enroll in a formally accredited art institute), which often happened, it was considered a success, because

most of the students applying to MIX Academy do so without a clear plan, negative attitude, limited self-confidence, and few skills. MIX Academy was considered as an intermediate step towards further education and sometimes a career, but lacked the formal recognition for the intrinsic growth it fostered among its students.

Pedagogical Level

MIX Academy had developed, and experimented with an innovative approach with students at the center of the educational process. Students were expected to take matters into their own hands, such as finding and creating a project to work on, to seek help among peers, and to assess each other's work. Students were in control and participation was not obligatory. The program integrated many relevant and engaging elements, such as weekly excursions and project-based learning and collaborative activities, which were generally very effective.

Although many students found the autonomy difficult to cope with, this was not a significant problem, and eventually beneficial for most. More important was the lack of consistent and valid evaluation of the effectiveness and impact of the approach and newly introduced elements, such as 'Earning while Learning' and peer-based learning and mentoring. The expectation among the teachers was that students would embrace these new elements and be able to participate in its implementation. However, lack of clarity about their value and the lack of structured support (e.g. to be a mentor for another student), had the result that students became skeptical of the education they received, and sometimes overlooked the benefits of the approach. The case demonstrated to us that perception of value matters just as much as 'the real value'. For example, some students grew frustrated about the fact that they were supposed to buy paint. They were not aware why it was their task. The principle, however, could provide a convincing answer. He told us that such decisions and responsibilities benefited them because they had to argue and collectively decide what to buy, which was a way to create interdependence. In addition, it would make them more aware of 'the costs, tasks, and responsibilities of being an artist'. In the end, no one was going to do this for them, and students were at MIX Academy to learn to take matters into their own hand. Making explicit the value of activities and reflecting on personal and external relevance seem essential, in particular when dealing with less confident youngsters in a highly autonomous learning environment. This was further confirmed by the very positive reactions to the more structured, weekly collaborative reflection sessions.

Another important insight was the concept of 'patience'. Rather than putting disengaged students under pressure, teachers approached them on a positive, nudging manner and through peer-pressure, even when students remained absent-minded and disengaged for over a month. Because all students had their own personal projects, there was less competition, and no feeling of 'being behind', and teachers made sure that disengaged students understood they were able to 'step

back into the program' at any time. They encouraged presence and participation, but were hesitant to determine their learning goals.

Role of ICT

The ad-hoc use of ICT seemed effective. During the informal lectures and workshops, teachers frequently referred to online sources to illustrate their message. Students all possessed their own laptop and materials, and there were no reports of distraction. Students were deliberate in the use of social networks, which were used as a venue to build a reputation, demonstrate one's creative works, as well as to network and hang out with friends.

Those students responsible for the school's website were clearly capable of doing that, and wrote interesting articles about lessons, workshops, and art. The writing process helped them reflect on their learning process and their role as 'reporters' also made them pay more attention during lectures and workshops.

As an independent and private institute, it could not offer software discounts to its students, and most students used pirated software.

This case study illustrates the potential and challenges of implementing a self-organized learning environment. Its potential has been shown by the changes in attitudes and skills of its students, while the challenges are diverse and significant, ranging from organizational and financial challenges to run a deviant educational institute to the pedagogical challenge to find, for each student, the most effective balance between structure and autonomy, transparency and discovery, and other sometimes contrasting elements. The next case describes the second pilot in the Netherlands, which was done in much different circumstances and a different group of students; recent migrants in a newcomer class in a regular high school.

4.8 The Netherlands – Second Pilot (NL2)

The second pilot in the Netherlands was conducted at an International department of the Berlage Lyceum. The pilot was introduced within a non-formal educational track aimed at preparing migrant kids for formal education. The researchers were directly involved in the supervision of the pilots and interviews with the students, teachers, and head master.

The following data have been collected and analyzed in the development of this case study:

Table 25 - Data Sources and Instruments (NL1)

Data sources & instruments	Description
Interviews	Pre-pilot open interview with the manager (head of the International Department), 60 minutes – 30 January 2012 During: Open interview with one teacher, 15 minutes – 13 March 2012 Semi-structured group interview with all three teachers, 90 minutes – 22 March 2012 Semi-structured group interview with two teachers and manager, 105 minutes – 10 May 2012 Open interview with two teachers, 60 minutes – 19 June 2012 Open interview with manager, 40 minutes – 21 June 2012 Post-pilot: Semi-structured interview with 5 students, 45 minutes – 5 July 2012 Two structured teacher interviews, 15 minutes – 5 and 9 July Focus group and open interview with all teachers, 110 minutes, 9 July 2012
Questionnaires	Teacher questionnaires (P2) – pre-during-post. • P2 response (2/3/2) Student questionnaire (P1/P2) – pre-during-post. • P2 response (14/4/4)* • * Towards the end, students became less interested in reAct, due to an examination period and frustration with the lack of personal progress.
Artifacts & Activities	Several student projects and presentations, and the teaching activities shared by all teachers. Pictures were taken during the final presentation session and during several visits.
Teacher log books	5 logbooks (aggregated from logbook notes by all three teachers) – 9 March, 29 March, 5 April, 7 May, 13 May
Partner meetings log/minutes	These included pilot experiences, highlights, pedagogical and organizational issues and intermediate results.

Personal notes	We took notes of every online and face-to-face meeting with the principle and other teachers. At least every two weeks we visited the school.
Facebook content (links, discussions)	Facebook was extensively used for sharing content. In addition to their activity on the International reAct Facebook group, a private group for Berlage students and teachers was followed.
Internet, websites	Information about Berlage Lyceum and the International Department was found on their website: www. http://berlage.espritscholen.nl/. In 2014, the International dept. became an independent school.
Internal communication and documentation	Basecamp discussions, shared internal documents and emails were used as data source.
Personal communication	We had extensive contact with the department head and all three teachers. The email communications as well as telephone conversations were important data sources. Approximately 30 emails have been used as data source.
Observations	Four class sessions were observed.

4.8.1 Context

The second pilot in the Netherlands was conducted at the 'International Department' at Berlage Lyceum. As a UNESCO school, with a strong international orientation, Berlage Lyceum was considered an appropriate school to approach for the project. The school offered formal high school education as well as various international programs, including a program for migrant youth/non-native newcomers under the age of 18 years old. Its curriculum was aimed at preparing these newcomers for formal education or employment and had a strong focus on Dutch language and culture. Within the newcomer program, the institutional framework provisions were relatively open: there were few formal guidelines or restrictions with regard to the educational goals, pedagogy, or curriculum for this group. However, the explicit goal was that these students should be prepared as fast as possible for enrolment in formal education, resulting in a relatively strict, subject-oriented, and formalized program.

The pilot was conducted with a group of 15 students aged between 15 and 18 years old. Some of the students had arrived in the months before the pilot, but the majority of the group had been in the Netherlands more than half a year. The newcomer curriculum was developed in 1980, and was considered by teachers as outdated and irrelevant.

After an intake conversation and some tests, students are placed in a cohort matching their level, and based on performance and test scores they are allowed to enroll in formal education, which students often regarded as a great accomplishment. The cohort in our pilot consisted of students who had failed to

progress fast enough to enroll in the regular educational track, and due to their age and perceived educational level almost none of them would be allowed to enroll in the formal educational track at Berlage. The atmosphere within this group of students was very negative, and many of the students were disengaged, demotivated for learning, and lacked self-confidence. Two-thirds of the students in this cohort had failed to progress to a higher level, while their former classmates did (and who would eventually be allowed to enroll in the formal educational track at Berlage). This, quite definite separation was very demotivating for most students within the pilot group and exacerbated their lack of confidence and self-perceived lack of intelligence. Students mentioned that they felt as if the school had no confidence in them anymore. Still, most students were ambitious and were quite clear about what they wanted to achieve, and considered education to be an important part of it.

Many students had personal issues and a challenging home situation: some had lived through traumatic experiences, were without family, or faced extradition to their native country. At home, parents or caretakers could offer only limited support at best, due to language barriers or absence.

The three participating teachers were between 40 and 60 years old, and were very motivated to participate in the project, to learn about using ICT in the classroom, and also to apply the principles as explained in the introductory presentation in January 2012. They taught Biology, English and Spanish, and Geography. In addition to their regular teaching activities, they taught at the International Department for approximately one day per week. They were certified teachers, but without formal training in relation to teaching migrant kids. Despite the extra work that came with teaching these groups, most teachers considered it more meaningful and worth the effort.

The teachers appreciated innovation in education and were able to describe innovative learning approaches in their own classes, including project-based learning, storytelling, and inquiry-based learning. One teacher was trying to develop a professional community of teachers using LinkedIn. Most of the time, their approach was subject-oriented and teacher-directed; students had little influence on what was taught, and how it was done. The teachers sometimes used ICT in the classroom (showing online videos, finding relevant assignments), and some used it as well as for personal development (following blogs, participating in online communities, etc.). They were also involved in the introduction of iPads in the school. There was a high level of teaching autonomy, in particular in the context of the International Department.

The interest in the pilot related with several factors. First of all, the international character of the reAct project was in line with the school's ambition to support learning in an international context. Moreover, the reAct approach and goals was relevant for the student group, because it was perceived as being less language-

based (and more creative), and it was expected that by encouraging them to explore and present their own interests, they would gain self-confidence. As we saw in the above description, many of the students in the pilot group felt they were not good enough for enrolling in formal education, as compared to their former classmates.

ReAct also appealed because of its relation with employability: the students were all in their final semester and would not return to the school after summer holiday (at the end of the pilot). Therefore, the pilot would have to motivate students to explore their interests, and to stimulate them to find a relevant school, job, or internship of interest, and to support the development of skills relevant for their future careers (beyond the school-setting).

4.8.2 Organizational Level

After the introductory meeting, an online training was developed based on the reAct training format, so teachers could get acquainted with some of the online tools and discuss (online) the practical application of reAct principles.[25] The learning activities integrated relevant reAct principles such as self-guidance, online collaboration, and ICT skills, so they would be better equipped to transfer these principles to the students. The objective of the course was to have the teachers develop a course plan using the reAct principles. The training was developed using the P2PU (Peer 2 Peer University) website and most communication with teachers happened through email. Due to time constraints, the teachers did not start with the online course, and the teacher preparation was therefore minimal: only an introductory lecture and two brainstorming sessions before the pilot started.

Teachers had frequent face-to-face interactions (every one or two weeks) with the manager, who showed interest in the project, and supported teachers actively by brainstorming about strategies, activities, and solutions for problems, by re-arranging the timetable, and by making sure the teachers understood that they were free to do whatever they found appropriate. The teachers met about once a week in a face-to-face meeting, and discussed progress, individual student projects, ideas for assignments and activities. One of the measures they took to manage students more effectively was through the assignment of individual students to one teacher.

The reAct partner was involved during most stages of the project, and consultation hours were arranged every one or two weeks. Through email, the teachers were informed about the overall reAct schedule and reminded about upcoming issues,

[25] The course can be found here: www.p2pu.org/en/groups/isk-challenge/ (in Dutch)

and on several occasions, the partner was also present during or at the beginning of class hours.

ReAct was organized as an additional activity to the regular curriculum. Students were taught in the regular/traditional way most of the time, and approximately four hours per week were scheduled for reAct. These reAct hours replaced the regular class hours. On a few occasions, reAct activities were continued during the regular hours as well.

4.8.3 Pedagogical Level

Familiarization. The familiarization phase started two full-day sessions dedicated to explaining and understanding the reAct project and kicking off the first activities. Teachers explained the objectives of the project, and asked students to register for the Facebook group and start communicating with the students from the other pilot projects. A local Facebook group was set up to accommodate local interaction between teachers, students, and the reAct partner.

A 'dream board' activity was developed as a lightweight and motivating assignment that encourages students think about, visualize, and share their interests. It was supposed to provide teachers with more insight into the interests and ambitions of students, which would be useful for upcoming activities. They were asked to make this using paper, glue, and magazine snippets, or using a digital tool, such as Glogster, Pinterest or Powerpoint. Interestingly, the arts teacher, who was skeptic about the reAct approach, enthusiastically joined this activity and helped students reflect on, and improve their 'dream boards'.

During this phase, students' engagement increased: they were able to work with new ICT tools, which excited them, and they liked the idea of having more control over what should be learned. The more personal approach of teachers reinforced this, and students' feeling of belonging improved. The 'dream board' activity was considered an effective activity resulting in interesting multi-media posters demonstrating students' interests and ambitions. Most students were eager to share their boards with other students online.

International Project. After the familiarization phase, students were encouraged to form project teams with participants from other countries using the reAct International Facebook group. Teachers acted as mediators and translators to structure the collaboration between students. They also tried to 'lead by example' by participating in the 'interest-sharing' activity and telling students about their own dreams and ideas for the future. The overall learning goals were not made explicit; rather, there was focus on the practical process and tasks that students were supposed to do. Teachers reminded them about upcoming deadlines, supported (or restricted) the use of ICT, discussed projects and topics, and promoted collaboration and the sharing of updates on the Facebook group.

Except for one student, all were excited by the opportunity to explore a personally relevant topic. Students started to collect information about these topics, which engaged occupied them for some time. Some example projects are the following:

- **Manga research.** An inspiring project was the 'Manga' project by Turkish twin sisters aged 18. Right from the start, they had expressed an interest to do something with Manga, which they had never before been able to do (in school). In addition to drawing their own manga comics (see for example Figure 26), they designed and conducted a questionnaire about manga: they collected more than 100 questionnaire responses from peer students at the school, and conducted several follow-up interviews. Their final presentation included their manga drawings, a historical analysis of manga and anime, different manga styles and characters, the topics of homosexuality and gender in manga, and the results of their questionnaire. After the project, they visited a manga shop in Amsterdam to share their drawings and talk about possibilities for printing.

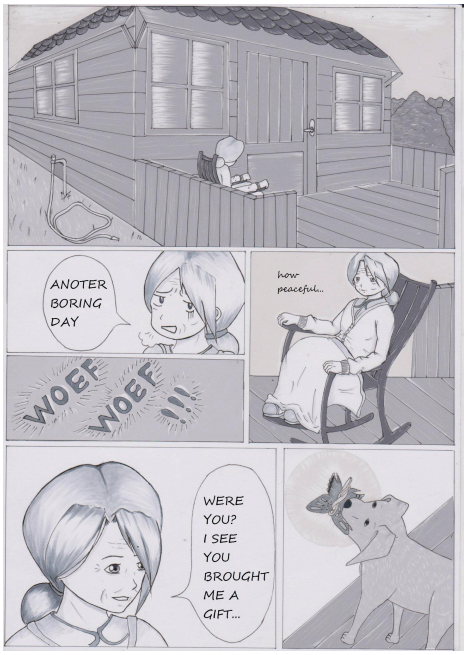

Figure 26 - One of the student drawings - Manga group (NL1)

- **Photography.** A girl interested in photography was asked to develop a portfolio, which impressed her classmates. One of them, an aspiring model, approached her and they decided to organize a photo-shoot. They took the pictures and aggregated them using an online magazine tool called *Readmo.re*.
- **Design.** A couple of students shared their interest in art and design, and were grouped together. One of these students asked his parents to participate in the project, who were professional designers, and were able to help students with professional tools and their studio at home. The students developed a stop-motion video of the design and creation of three creative t-shirts (they all designed and painted their own t-shirt), which received with much enthusiasm during the presentations.

Besides these examples, only few students were able to keep themselves engaged with their projects throughout this phase. It was challenging for them to set feasible and realistic goals and plan towards meeting those goals. Their activities were mostly 'diverging' and exploratory, and few were able to transition into a more convergent, project-execution approach. There was no international collaboration. The support from teachers was insufficient and frustrated the students, but overall engagement during the reAct hours remained high. At the end of the international

project phase, a session to present the student projects to other cohorts was organized. Two other cohorts were invited for the presentations, and there was a Q&A afterwards, which was structured and facilitated by the teachers. The upcoming session and deadline caused much engagement and excitement among students, and teachers considered the presentations better than expected. About half of the presentations revealed a project, while the other half made a presentation about their hobby or interest.

Local project. The local project was not announced or discussed until one or two weeks before it was scheduled to begin, which surprised many students. Students were asked to pick a new topic or – if they wish – continue with their former topic, and then collaborate locally on their projects in a similar way they did with the International project. Students, who in the previous phase were less engaged or 'successful', reacted with skepticism.

The local project initially had the same generic approach and objectives of the International project: exploring one's dream or interest, making a proposal to investigate something related with it, and making a presentation or some other creative output to be shared with the other participants. Students wanted to have more structured support, and a 'project handout' (a spreadsheet) was developed that outlined all the steps of 'doing a project', including examples, and teachers requested from students to use this spreadsheet and to keep it up to date. Due to time constraints and the upcoming examination period, most activities and tasks were devised and introduced in a rather ad-hoc fashion, without much reference to the curriculum or any other formal structure.

Students were again asked to present their (new) projects by the end of the pilot in front of another class, who would give feedback and ask questions about it. However, many were just not engaged enough to continue participation at this moment, which was further hampered by an upcoming examination period. Although none of the students was obliged to take exams, the idea that their former classmates were taking exams, and they were not, amplified a notion of reAct as an activity to keep them busy until the year is finished. It was decided to take a break from reAct and let those students who wanted, prepare and take exams.

Final integration. Due to limited effects on engagement, disengagement among some of the students, and requests from students for 'real education', teachers continued with the more structured teaching approach. They developed activities related with employment, with assignments such as writing your CV, arranging internships related with students' interests and ambitions, and discussing personal branding. Rather than arranging these internships, teachers considered it appropriate for students to help them connecting with relevant people, but to give them the responsibility to arrange a formal interview. Students with academic ambitions were

asked to find relevant educational programs and investigate the formal entry requirements, and supported them to prepare for the necessary exams.

Students were supposed to develop a professional or academic mindset and attitude: they were responsible for calling the prospective 'employer', to make an appointment, to be in time for work, to pay attention and to follow instructions at work. There were practical goals as well, related to the work or profession, and to help students gain an understanding students of working in a particular domain or industry. Three examples are described below:

- The student, who was interested in photography, was asked to investigate the workings of the eye in the biology classes and was given content, time and specific materials to do that. In addition, with some other students, she was allowed to visit a photography museum (FOAM, Amsterdam). She also took 'modeling pictures' of another student who wanted to become a professional model. Towards the end of the pilot, she and other students arranged an internship at the museum.
- Another student, who was very fond of dogs and some experience in running a small dog-walking service, was given a sort of dog encyclopedia. The teachers arranged one day at the animal emergency service in Amsterdam, and she was suggested to visit an educational institute focused on animal care, where she eventually registered as a student.
- Another student, from Tibet, chose to tell others about the situation in his country. His wish was to go to an international Tibet conference in Switzerland, and thus – insisted by the teachers – he started a crowdfunding campaign in the school to collect the money to be able to visit that conference and in the end, he managed to collect the funds and went to the conference.

The focus on professional development during the local integration phase was more successful in engaging students. Because in earlier activities students actively shared their interests and ambitions, teachers were able to find a relevant academic or professional opportunity for each student. The relevance of the activities was clear to all participants, which made it easier for teachers to facilitate and motivate students. Further integration of the reAct principles and the idea of self-guided project-based learning would require much more time and experimentation, but teachers were positive about its potential.

During this phase, teachers also introduced a more effective coordination mechanism. Teachers found it difficult to keep each other up to date on the progress of students and to overcome this problem, each student was assigned to a teacher, who kept a personal student record and was responsible for the progress. Students were supposed to address 'their teacher' when they had any requests or questions.

Table 26 summarizes the pedagogical approach at Berlage Lyceum.

Table 26 – Pedagogical Principles (NL2)

Principle	Description
Self-guidance	Students were free to choose their topic, desired results, tools to be used, and students to work with. Based on feedback from students, and their limited progress, a more structured approach was considered necessary, which also included substantive support. Support would have to address the entire process of discovering and expressing an interest, creating a group, preparing a project proposal, executing the project, and assessing what was learned and done. The introduction of deadlines, especially for the final presentations, also seemed to positively affect engagement and student activity level. Once the date was settled, students started working towards it.
Collaboration & Interaction	Students were encouraged to find a collaborator to work with others on their projects, and to share their works online. Three groups (of 2-3 students) were formed that were successful in executing and presenting a project, while the other students, including those who chose not to collaborate, produced lesser outcomes. International collaboration appeared to be too difficult to organize. Still, the international factor appealed, for some weeks, to most students, and students were interested in what other students had to share. The presentations were quite a boost for engagement; many students reported that it made them a bit anxious before, but also more confident afterwards. Many students were very enthusiast about sharing their interests online and connecting with other students. For some, it was an opportunity to tell about what truly mattered to them (for example, injustice). At first, students appreciated the different approach. However, when they encountered barriers, did not progress, or became frustrated for a lack of feedback, they became skeptical and starting comparing 'their treatment' with the 'normal education' enjoyed by the former classmates, which gave rise to a sense of jealousy.
Relevance	The student's interest or ambition (expressed in their dream board) was used as a starting point for suggesting a project or internship. Even in regular classes, content suggestions were personalized using the students' interests and teachers inquired about students' interests, much to their appreciation. It led to more personal and trusting relationships between students and teachers, and new collaborations between the students. In addition, teachers were able to help all students in getting an internship and to explore relevant educational opportunities. Because students were given time to explore what mattered to them, and were helped in connecting their interests to a professional or academic field, they became more aware of their own identity and ambitions, which in turn improved most students' confidence. It also helped them focus on topics they could be passionate or proud of, instead of curriculum topics they had failed to pass in the previous semester. Not all students were able to define what interests them, and some demonstrated only superficial in a topic; these students were not able to explain their interest in detail and how it connected to their own personality,

background, or ambition. Teachers argued that more time was needed, at least for some students, to explore a range of interests and to understand what truly interests them. Those students with a more profound connection with their proposed topic were more persistent and more successful in self-guiding their projects.

Many students indicated that they needed evidence into what they were learning by doing 'these projects'. It has to be understood that their former classmates were 'graded' and received reports as 'proof for their learning'. Teachers agreed and expressed a need for (the development of) an assessment framework to support this. This would also overcome skepticism among some students, especially those who were used to a hierarchical educational culture, thought of education as a purely teacher-controlled process. They considered self-guidance and project-based learning as less relevant than traditional teaching and demanded to return to 'normal education'.

Finally, there were some complaints by students about the lack of transparency about the process: the local project was announced later into the pilot.

There was limited feedback and guidance during the project-related activities, because teachers were not sure how to give substantive support for topics they themselves had no knowledge about. The language barrier also made giving feedback (and explaining learning objectives) more difficult: some students barely spoke English or Dutch. Feedback was given merely in the form of suggestions and motivational statements, and by reminding students about upcoming deadlines. There was less support for important tasks and activities such as initiating, facilitating, managing, and (self-)assessing student-projects. It was also difficult for teachers to be aware of progress made by all students, and many students remained hesitant to ask for help or suggestions. During the presentation sessions, the audience received a feedback form. Some students received structured feedback and were assessed during their internship.

Less than half of the students were able to largely self-guide and self-organize their projects. The learning benefits of participating in the pilot were not clear enough for many of the students. The structured assignments and guidelines for project-based work in the second phase of the pilot did not have the intended effects, because of several reasons: i) students had become quite skeptical, and it was difficult to convince them to participate, ii) although there were guidelines, learning objectives were not considered enough to students, and iii) the guidelines were presented using an online spreadsheet, which apparently was difficult for students to use or retrieve.

ReAct was scheduled for only four hours per week. During the remaining hours, students received 'normal education' and were assessed using formal assessment frameworks, and most students participated in graded exams (at their request).

There was a separate ICT room with relatively new Mac computers. These were public computers, and configured in such a way that students were not able to install anything or save locally. Normally, students would not be allowed to YouTube or Facebook, but during the reAct ICT sessions this was allowed.

The teachers mostly used email and Facebook to communicate with students. Facebook was also used to reply to students' posts, to 'like' their posts, and to remind students about upcoming deadlines.

Google Drive was part of the default ICT environment: the school used Google Apps and every student had an email account through Google (and access to all the other services offered within Google Apps). Google Drive Apps ("Slides", "Documents", and even "Forms") were used extensively for student projects. Also, Google Forms (survey tool) was used for one of the projects, and responses from more than 100 other students were collected. Other tools included Final Cut Pro (video editing), Pinterest and Glogster (exploring/visualizing interests).

Wherever possible, the teachers and researchers involved helped students make better use of the tools. Because both students and teachers had some difficulty managing projects, a collaborative spreadsheet (Google Drive) was developed that contained all the basic steps required to complete a project.

4.8.4 Results

The reAct project was experienced as a positive experience by the teachers as well as most students. Generally, both teachers and students considered participation in the reAct pilot as a positive experience, which had brought a change to the atmosphere in the class, despite the reduced engagement and frustration at the start of the local project phase and during the examination period.

The following paragraphs include reported outcomes and survey results that describe the effects on engagement and development of skills among teachers and learners.

Engagement

This group was, quoting the department manager, the most challenging group to work with in the school. Before the pilot started, overall engagement was low; students often did not show up, and those who did were passive in class. There were positive and negative experiences, and not all students persisted until the end. Different students were motivated by different aspects of the pilot: the interaction with students abroad, the use of creative ICT tools, interest-based projects and growth of confidence, and the more personal interaction with teachers.

Immediately after the first session of the project, motivation among students, their engagement increased significantly. Personal attention and interest from teachers made the students feel taken seriously, and all were excited about the prospect of working on a personally relevant project. The atmosphere in class improved and

students became more pro-active, showing up more often, and smiles and laughter was heard during classes, not just the reAct sessions, leading to increased interest in reAct from other teachers. The 'dream board' activity was engaged students; it was easy enough to do and many students liked to express and share their interests with peers. Two female students also told us that in their culture, their dreams were not feasible or accepted, but that they felt free enough to dream it in class.

After this initial burst of progress and engagement, activity and engagement dropped. Attempts to facilitate international collaboration failed, causing frustration and confusion about the project. This did not affect the (local) student teams that had managed to define clear project objectives; they remained committed and engaged. The 'final' presentations of the first phase brought some remarkable student presentations, and all were presented with passion and engagement. This surprised some teachers, who were unaware of the progress some students had made.

At the start of the second phase there was quite a bit of resistance, as said, partially due to a lack of transparency about expectations, activities, and learning goals. Teachers were also confused about the approach for the second phase and how it would differ from the first phase, and implemented several more and less successful activities. The most important barrier was that the value of participation was not (made) clear enough to the students. Furthermore, teachers were able to give only limited learning support. The upcoming examination period emphasized a feeling of 'being kept busy': students realized that their former peers were getting ready for a next year, receiving grades for the exams they took, and preparing themselves academically. In contrast, reAct was perceived, by some in our pilot group, like occupational therapy with limited perceived value.

Only half of the students presented something during the second (final) presentation session, while all students delivered well-prepared presentations during the first presentation session.

The participating teachers, although engaged from the start, also developed some doubts about the approach and their activities during the second phase. This was another reason to introduce a 'pause', during which they returned to teaching regular content. Teacher absence and upcoming exams were other reasons for introducing a temporary 'pause'. All teachers indicated that they were very much interested in continuing the approach with sufficient organizational support.

Skills and Attitudes

During the first half of the pilot, when engagement was high, teachers remarked that some of the students who were inactive before, and never approached a teacher, asked relevant questions in class and took interest in other projects. For example, a formerly rather aggressive student became very positive, open, and enthusiastic, because he was able to work on the thing that matters most to him. For

some students, a significant change in self-confidence and a more open and interested attitude towards others was reported as a result of their participation in the reAct pilot and especially after the first presentation session. Other students said the project 'opened them up' and now they were considering new paths in life. The most tangible and relevant outcome was that all students explored and presented topics of their own interest, and pursued personally relevant professional and academic opportunities, facilitated by the teachers.

ReAct was considered to be a tool to help students explore their dreams and their capabilities. The personalized approach improved trust levels between students and teachers. Teachers also argued that reAct was an effective approach to help students to overcome psychological barriers and become more confident, which they thought of as being more important than the development of skills. The students would have liked to learn more skills and get better feedback, for example on how to do project management, which was new to them. Students did become aware of the fact that starting or executing a project is complex and requires good planning and commitment.

Towards the end, due to different circumstances, many students became agitated and withdrew from the pilot, claiming that reAct was only something to keep them busy. Some of the students still felt 'excluded' from the school, and they sometimes saw reAct as the cause for their frustration.

Teachers reported that the pilot changed their view on education, as it helped them reflect on their own role as a teacher. The approach was new to them, and often considered very challenging, in particular the combination of interest-based and project-based approach. They learned about their own deficits and also about the strengths of a more student-centered approach. Two teachers were also more confident in the use of online tools and in particular the use of social media for learning and more aware of the risks involved, such as distraction and lack of ICT skills. Finally, the teachers also recognized the value of collaborating closely with colleagues, which they missed in 'regular education' settings.

4.8.5 Conclusions and Reflection

The focus of the reAct pilot at Berlage Lyceum was on self-guidance and giving ownership to students by giving them the opportunity to investigate a topic of their own interests. There were positive as well as negative experiences with the new approach. Below, we reflect on the implementation context, the organization of the approach, and its pedagogical approach.

Context

A significant factor seemed to be the underlying motivations of students to be in school. Due to their failure to enroll in a higher level of the newcomer program, many students lacked confidence, which affected the way they approached difficult

situations: by avoiding those. More than anything else, these students wanted to be recognized. They frequently compared their (educational) experiences with those of their former classmates, and came to the conclusion that they were being kept busy, while the others received *normal education*.

Other relevant insights were that for students used to hierarchical teaching cultures (that require passive students), the perception of the reAct approach seemed negatively biased. Limited proficiency in Dutch or English complicated the teaching and the support had to be simplistic and high-level. The lack of other skills, including ICT skills, information literacy, project management, and collaboration skills also affected progress and deeper learning.

Finally, the limited size of the cohort (15 students) benefitted the approach and teachers indicated that they were (just) able to give every student personal support and attention.

Organizational Level

The short teacher training and late start of (the organization of) the pilot resulted in a sometimes chaotic, ad-hoc, and inconsistent approach. It also explains their apparent inability to convince some of the students of the value of participation. The very few hours per week (approximately 4 hours) appeared to be insufficient for the kind of deeper engagement that was desired and required for effective participation. Students argued that more time was needed to finish their projects. Teachers said more time was needed to reflect on the various activities. Another barrier was the fact that reAct hours were not organized as consecutive hours; sessions that lasted for just one hour were ineffective because it took 15-30 minutes for students to log in, get organized, and get into a working mode.

Due to the limited time for reflection and the limited time to formalize procedures and outcomes, integration of reAct principles and activities within the regular program difficult. The teachers expressed a need for documentation and assessment framework addressing the specific skills fostered by reAct activities (i.e. project-based learning). They argued that interdisciplinary projects and activities and thus the involvement of more teachers offered great potential for integration and assessment.

Teacher-training and preparation was considered insufficient. The teachers and the manager suggested that a three-month preparation time would be required, and that preparation should be integrated into staff development hours. The learning objectives, desired outcomes, and planning should be clear at the start of the pilot.

The department manager was supportive and motivational, but was unable to provide teachers with extra working hours to prepare or reflect on activities. Teachers considered the reAct documentation interesting and relevant, but not practical enough, and made suggestions to improve it (such as the specification of

roles and responsibilities of teachers and students, tasks and learning objectives, feedback and assessment).

To implement reAct, teachers depended on each other, which forced them to collaborate. This was a very positive experience for all of them. They said that normally, you don't have to collaborate much with colleagues. Also positive was the involvement of other colleagues, who joined in and continued with the activities in their classes. This increased student motivation and gave extra credibility to the approach. Conversely, some teachers shared their skepticism with the students in the pilot group, which had the opposite effect.

Pedagogical Level

The case demonstrates that (perceived) relevance was an essential factor for (dis)engagement and that consistent and meaningful support was required for most students. Only few students were consistently able to progress without support. The variety of topics proposed by students as well as the lack of project-management, collaboration and other skills (among teachers and students) were the most important reasons for the lack of learner support and lack of progress. We have also seen the importance of being clear to students about what should be expected from the learning process, and what their role is in the process.

The sentiment in the group went up and down, and it became clear that students were influenced strongly by others within the group. Perceptions and opinions of some students could easily affect the perceptions of the others. As we have seen, many students mirrored their experiences with those of former classmates.

The sharing of interests has shown great potential as a way to offer personalized support and suggestions. However, it should be noted that considerable effort has to be made, by teachers and learners, to come to a point where one can speak of a 'true interest'. Many students frequently 'switched' interests and remained in a divergent state of exploration. Ultimately, this will affect how they perceive the relevance of participating.

Role of ICT

Students with little commitment to their project were often distracted by ICT, while ICT was used in more creative ways by more committed students. The information literacy and ICT skills of students were very limited, and some students were hampered by their limited proficiency in English. They were able to navigate the Internet, search content using Google Search, and knew a few websites and games. They were generally unorganized and mundane tasks, such as registering for or logging into an online service were problematic as students were unable to remember or retrieve their passwords or confirmation emails. Email inboxes were a mess and often teachers' emails went into the archive without ever being read. Teachers, analogously, were not specific in their suggestions on how to use ICT

either, and frequently told students 'to share updates on Facebook'. Some students described reAct a waste of time, 'because you're only posting stuff on Facebook', but most were neutral to positive about it, especially about the various easy-to-use creative and visual tools, such as Pinterest and Glogster. The reAct ICT toolbox was only sporadically used. It was difficult to keep track of what students were doing, but the impression was that, at most, half of the time of the ICT sessions was spent effectively on projects, and most time was spent on viewing irrelevant content, gaming, and chatting with friends. Most students used their mobile phones for their projects for interviews, and making pictures and videos.

The opportunity to share 'stuff' with other students triggered a student from Tibet to share his deep concerns over injustice in his native country. This activity significantly empowered him and allowed him to pursue an intrinsic desire to become an activist. Teachers appreciated the use of Facebook (groups), because they gained insight into what students were thinking and what they were interested in. Contacting students also was considered more effective through Facebook than through email.

The lab hours often lasted for only 1 hour, and students spent between 15 and 45 minutes on activities that did not directly contribute to their projects. Much time was spent on starting the computers, logging into the school account, signing up for new services and learning how to use them, retrieving emails to reset forgotten passwords, installing a driver needed for online Flash content (not always allowed), retrieving downloaded content or documents stored on a networked drive or flash drive, and other activities unrelated to the student-projects.

This final case study, despite having limited sustained impact on its participants, was an important contribution to the study, as the proximity of the pilot allowed us to take a closer look at the factors and conditions and pedagogical factors that made engaging this group of students a challenge.

5 Cross-Case Comparison

Combined with the previous chapter, this chapter answers the third operational research question **"How were these principles applied in different educational contexts?"**

All pilots followed the same phased approach; teacher training, familiarization, international project, local project, and integration. However, teachers and local partners had considerable freedom to design activities, which resulted in different approaches in different contexts. Implementation depended on possibilities and constraints in a particular context, the target group's needs and objectives, the teachers' skills and beliefs, and of course the interpretation of the reAct approach and principles. Therefore, to appropriately interpret and analyze outcomes (section 5.3), a clear overview of context (section 5.1) and implementation is needed (section 5.2). The three main sections in this chapter address the following three sub-questions:

i. In which educational setting contexts was the reAct approach implemented?
ii. How was reAct implemented (organizational, pedagogical) in these different contexts?
iii. What were the results in each context?

We answer these questions through a cross-case comparison of the individual case studies, which can be found in the previous chapter.

The intention of this chapter is to create an overview of all relevant context factors and organizational and pedagogical decisions that affect student engagement, the development of skills, and overall appreciation. To allow comparison, factors are compared in a table at the end of each section. This chapter forms the basis for the

next chapter, which is more analytical and design-oriented and focused on building a pedagogical design framework for at-risk youth in different educational contexts.

5.1 In which educational contexts was reAct implemented?

The goal of the reAct project was to develop and investigate an approach that would engage at-risk youth in different educational contexts. Most pilots were organized as an addition to, or integrated into non-formal educational programs addressing at-risk youth between 15 and 26 years old. Only in Italy, the pilots were conducted within a formal high-school context. Although implementation in a formal high school context was not part of the original plan, the different context offered an extra dimension to the case study as it demonstrated the difficulty of implementing the reAct approach in a formal, strictly regulated educational environment.

The educational context of the different cases can be described using the following two main categories:

i. Institutional level; the type of school or institute, and its objectives, relevant regulations and institutions.
ii. Participants: physical learning environment, information about the students and teachers (initial attitudes and objectives, skills and relevant experiences), course topics.

5.1.1 Institutional level

The pilots were conducted in six different countries and 10 different institutes. In Spain, Portugal, Austria, and Greece, these were training centers targeting, among other groups, at-risk youth. In the Netherlands, the first pilot was executed at an art school that aimed to support young people explore and develop their identity through art. The second pilot was conducted in a regular high school as part of the school's 'newcomer program', which aims to prepare young migrants to enter high school or continuing education. In Italy, both pilots were conducted within regular high schools, with students who were considered disengaged and at risk of dropping out. Topics addressed creative skills (such as ceramics or the art and design school in the Netherlands), traditional high school topics (Austria, Italy, Portugal) and vocational training (Spain, Greece).

The participating institutes were funded and controlled in different ways. For example, KEK Kronos and MIX Academy were private institutes that were less bound to external institutions that regulated the content and design of educational programs. KEK Kronos was funded by the municipality and local companies, and MIX Academy depended completely on the students' tuition fees. Most other institutes were funded by the central government or municipality, with varying degrees of autonomy to design and implement innovative educational programs. The teachers in the Italian and Austrian pilots had little freedom to divert from the regular educational program: in Italy, teachers were supposed to follow the formal

curriculum, and in Austria, the pilot was conducted at a large institute with strict targets for teachers, also related to the formal curriculum.

The physical learning environment in Italy, Greece, Portugal, and Berlage (NL2) can be characterized as a traditional classroom setting, with students behind tables that are lined up facing the teacher and blackboard. The Spanish and Portuguese pilots were organized in both classroom and workshop environments, and at MIX Academy (NL1) the education was organized in a large studio, which students characterized as 'a cool, chaotic and creative place'. The studio was inside a 'creative hub' in the center of Amsterdam, with many startups and creative agencies.

Table 27 gives an overview of the different institutional contexts and characterizes the learning environment, which ranged from formal, restricted context to independent and autonomous settings.

Table 27 - Institutional Context and Learning Environment

	Type	Funding	Rules and restrictions	Content orientation	Classroom setting
PO	Training center	Central govt.	Some autonomy	High school curriculum	Traditional
SP1	Training center	Municipality	Some autonomy	Vocational Internships	Traditional Workshop
SP2	Training center	Municipality	Moderate autonomy	Vocational Internships	Traditional Workshop
IT	High school	Central govt.	Poor autonomy	High school curriculum	Traditional
GR	Training center	Municipality Local companies	High autonomy	Vocational	Traditional
AU	Training center	Municipality	Poor autonomy	High school curriculum	Traditional
NL1	Art school	Students tuition fee	High autonomy	Vocational Entrepreneurship	Studio
NL2	High school	Central govt.	Moderate autonomy	High school curriculum Dutch language	Traditional

5.1.2 Participants

The teachers in most pilots expressed significant interest to implement reAct. In Portugal, Austria, and the first Spanish pilot, teachers were selected by management; in all other cases the teachers volunteered to participate. Teachers were mostly interested in the opportunity to explore and use ICT and in the application of the reAct pedagogical principles. The Greek teachers, and Spanish (P2) teachers explained that these principles and related ideas had been discussed

previously, and that reAct was a great opportunity to put their thoughts into action. Teachers also expected to develop teaching skills through participation and teacher training, which was an additional motivation. Teachers in the Greek and Italian pilots would be certified for the participation in the reAct project and the teacher training. In particular the Greek teachers, who were mostly self-employed, were motivated by the perceived benefit of participation for their careers. In Austria, teachers received extra remuneration for participation in reAct. In some pilots, there was a strong drive from the management level to participate. At MIX Academy, participation was driven by the idea of spreading their ideas about education, while at the same time increasing the recognition and reputation of MIX Academy.

Few teachers had experience with self-organized and student-centered learning approaches, including project-based and collaborative learning. Except for MIX Academy teachers, reAct was considered as something very novel and different from the regular practice. Nearly all teachers described their regular pedagogical approach as teacher-directed and both subject- and practice-oriented (Illeris, 2007). Experiences with ICT were limited to administrative uses (Moodle) and productivity tools such as Microsoft Word and PowerPoint. Most teachers had experience with teaching at-risk youth and addressing their specific concerns, but there were different interpretations of what caused disengagement. Some teachers primarily explained disengagement as a result of lack of intelligence and commitment, and others said disengagement was primarily caused by students' unsupportive social environment and an inappropriate educational system.

Table 28 gives describes the teacher profiles for each of the cases.

Table 28 - Teacher Profiles

	Motivation to participate	Initial pedagogical approach	Topics
PO	-Learning: ICT Pedagogy - Management	Teacher-directed Subject-oriented Practice-oriented	EFA course with three compulsory domains: I. Culture, Language, and Communication, II. Society, Technology, and Science, and III. Citizenship and Professionalism.
SP1	- Learning: ICT - Management	Teacher-directed Subject-oriented Practice-oriented Collaborative Creative / hands-on	Vocational: A 'workshop' (=practical) program on ceramics on the advanced professional level.
SP2	- Learning: Pedagogy, ICT - Altruism	Teacher-directed Subject-oriented Collaborative	Vocational: Gardening, Forestry nursery, Support teacher (Sciences and Humanities), Painting, Metal

	Motivation to participate	Initial pedagogical approach	Topics
		Project-based learning Collaborative Creative / hands-on	constructions, Lock work, Welding, Building, Maintenance, DIY, Restoration work, Electrical, Plumbing and Carpentry.
IT	- Learning: ICT - Career/CV building	Teacher-directed Subject-oriented	Three different highschool curricula → technical (theoretical), general vocational (gastronomy, agriculture), and art.
GR	- Learning: ICT, pedagogy - Career/CV building	Teacher-directed Subject-oriented Collaborative	Vocational: Tourism (P1) and Business Administration (P2)
AU	- Learning: ICT - Management, remuneration	Teacher-directed Subject-oriented Collaborative Project-based learning	High school curriculum: Math, Physics, Biology, English, Sports, Music, History and Career Guidance.
NL1	- Promoting school - Altruism - Reputation	Diverse: mostly student-directed and practice-/experience-oriented Collaborative workshops Self-organized & project-based learning Creative / hands-on Entrepreneurial	Vocational: art and design – theory and practice.
NL2	- Learning: Pedagogy ICT - Management	Teacher-directed Subject-oriented	High school curriculum: Dutch language and culture, math, English, geography, biology

The participating students were mostly dropouts, migrant youth, and unemployed youth from lower socio-economic backgrounds, and with little perspective on paid work. Most had a history of poor educational performance and negative experiences. They had little self-confidence (in their ability to learn), a low sense of belonging, were passive and disengaged. The majority of the participating students were part of a re-integration program or second-chance educational program, and their main concern and motivation was to get a certificate. There was a clear preference for practice over more theoretical or academic topics. The Italian students were high school pupils, and most had not dropped out (officially), but considered at risk of doing so. At 16, these students were allowed to leave school, and it was feared that many of the students would do that in order to find work, even without a diploma. These students also showed little initial commitment to the reAct project or school in general.

The group size differed between smaller groups of 10 students up to cohorts of 30 students (in Italy). In most situations, there were more male students than female students. Age groups also differed; there was an equal balance between pilots with adolescents aged 15 to 18 years and young adults aged 18 to 25 years.

The table below contains the 'student profiles'.

Table 29 - Student Profiles

	Age & size cohort	At risk 'profile'	Initial attitudes & interest in reAct
PO	18-25 years P1: 11 students P2: 14 students	All dropouts from the previous year. All were full-time or part-time employed (low skilled jobs).	Primarily committed to obtaining a certificate. Some interest in ICT.
SP1	15-17 years 14 students	All dropouts from a previous program. Lack of self-confidence.	Interest in the school's topics. Plus committed to obtaining a certificate. Interest in using ICT.
SP2	17-24 years 35 students	Unqualified and unemployed youth. Stigmatized, uncertain.	Interest in the school's topics. Plus committed to obtaining a certificate. Interest in ICT and international project.
IT	15-17 years P1: 3x25 students P2: 2x18 students	Disengaged high school students, at risk of dropping out. Reaching age at which they can legally opt out of formal education.	Mixed: most with little commitment, only interested in high school diploma. But about 20% of the participants were serious about school and clear about their career paths and professional interests. No particular interest in reAct.
GR	19-25 years P1: 15 students P2: 9 students	Dropped out, no formal qualification. Lack of self-confidence.	Result-oriented: committed to obtain certificate. Interest in ICT.
AU	15-18 years P1: 19 students P2: 14 students	Unqualified youth, some dropouts, some migrants from Balkan and North Africa with language and cultural barriers. Many without parental support. Lacking basic learning skills, communication deficits, and concentration problems.	Mixed: some were interested in the school's topics. Most were primarily committed to obtaining a certificate. Interest in ICT.
NL1	18-25 years 15 students	Dropouts, unqualified and unemployed youth.	Students' interests along two dimensions: - Self-exploration (experience) - Art and design (school topics)

	Age & size cohort	At risk 'profile'	Initial attitudes & interest in reAct
			No specific interest in reAct.
NL2	15-18 years 15 students	Disengaged migrant youth, not performing well at school, low self-confidence.	Mixed ambition levels and limited interest in school. Disengaged and disappointed. ICT, international project, and exploring interests.

5.2 How was reAct implemented in these different contexts?

This chapter summarizes and describes how reAct was implemented across the different cases. First, it addresses the organizational level, concerned with the integration of the pilot, the support for teachers and the role of management. Then, a summary of each of the phases follows, including relevant activities, strategies, and implementation procedures. Finally, we focus on the pedagogical approach, including the use of ICT.

5.2.1 Organizational Level

Teacher trainings were organized very differently across the various pilot contexts, both in terms of time investment and in terms of substance. In Portugal, teachers followed a teacher training that involved five sessions of five hours, 25 hours in total, and the teacher training before the second pilot in Spain was even 35 hours. The teacher trainings of most other pilots were less intensive, with a time investment of approximately 6 to 12 hours. The second pilot in the Netherlands involved a face-to-face introduction of the project followed by a 10-hour online course. Unfortunately, none of the teachers actually started the course, which meant that teachers were hardly prepared before the start of the pilot. The focus of teacher trainings different to those concerned with the use of ICT (practicing with tools), to those that addressed the pedagogical principles (preparing and discussing learning activities). The Greek and Italian project partners offered certified teacher trainings, which was an additional motivation and even attracted interest from teachers who would not participate, but just wanted to do the teacher training. In Austria, the prospective teachers for the first pilot were involved six months in advance. They were regularly informed about the upcoming project, and they frequently met the local project partner to discuss questions and possible learning activities. In Portugal, Austria, and Greece, the pilot -1 (P1) teachers were asked as mentors for the teachers in the second pilot.

In Austria, Portugal and Greece, project partners were directly involved in the implementation of the pilot as manager and teacher, as shown in Table 30. In Greece, the project partner was its general manager as well as teacher trainer, and in Portugal the project partner was manager and teacher. The Austrian partner worked as trainer and manager at the training institute that designed and organized

the courses, which were implemented in schools outside of the institute. The project partners in Spain (project coordinator), Italy and the Netherlands[26] had an advisory role and had no formal affiliation with the institutions or centers responsible for implementing the reAct approach.

In most centers, the educational program and curriculum was oriented at professional and vocational development to the participants' opportunities to find work or, in some cases, access to continuing formal education. reAct was – partially or entirely – *integrated into* the training program and time-table. The Austrian and Portuguese pilots were part of a 'second-chance' educational program for dropouts that prepared them for the regular, formal high school exam at the end of the year. In Austria, where the class consisted of migrant youth in addition to dropouts, reAct was not integrated into this program; it was organized as a separate program *additional to* the formal program. This implied that teachers and students had to balance how much time they were to spend on the formal program versus projects and activities that were part of the reAct pilot. The same applied for newcomer program at Berlage Lyceum (NL2), which prepared students for enrolling in the formal educational high school program and – essentially – taught students the Dutch language. ReAct was *additional to* the regular program, but the participating teachers were allowed to spend one hour less on the formal program, in order to make time for reAct.

An overview of the organizational settings of each case

Table 30 – Organization of reAct: Teacher Training and Support & Level of Integration

	Integration + time (hrs/wk)	Teacher training: time (hrs) & content	Mentoring and additional support
PO	Integrated – 17 hours	25 hours: Pedagogy and theoretical issues / Preparing learning activities / Exploring and testing ICT tools / Discussing tips and tricks to facilitate project-based learning and collaboration	Strong partner** support (daily) P1 teachers as mentors (during P2)
SP1	Partially integrated – 14	10 hours: Exploring and testing ICT tools	Significant partner support (weekly visits plus one-hour

[26] We were also the research partner in the consortium

	Integration + time (hrs/wk)	Teacher training: time (hrs) & content	Mentoring and additional support
	hours		phone calls per week)
SP2	Integrated – 20 hours	35 hours: Pedagogy and theoretical issues / Preparing learning activities / Exploring and testing ICT tools / Discussing tips and tricks to facilitate project-based learning and collaboration	Significant partner support (weekly online meetings and bi-weekly visits)
IT*	Additional – 3 hours	9 hours: Exploring and testing ICT tools	Limited management support. P1 – Moderate partner support: weekly visits or calls P2 – Strong partner support: weekly visits + personal coach present during all reAct hours
GR*	Partially integrated – 10 hours	16 hours: Pedagogy and theoretical issues / Preparing learning activities / Exploring and testing ICT tools / Discussing tips and tricks to facilitate project-based learning and collaboration	Strong partner** support (daily) P1 teachers as mentors (during P2)
AU	Additional – 5 hours	6 hours: Exploring and testing ICT tools	Moderate partner** support (weekly) P1 teachers as mentors (during P2)
NL1*	Integrated – 32 hours	3 hours: Preparing the workshops No ICT	Mentoring by principle teacher / manager
NL2	Additional – 4 hours	2 hours (plus online course ~ 10 hours): Pedagogy and theoretical issues / Preparing learning activities / Exploring and testing ICT tools / Discussing tips and tricks to facilitate project-based learning and collaboration	Moderate partner support (once per week) Moderate support from manager (changing time tables, discussing progress).

**these institutes offered certification or official recognition for participating*

*** these partners were employed by the institute where reAct was implemented, and therefore had more direct influence on the practical implementation.*

5.2.2 The pedagogical approach

In five pilots (in the cases IT, AU, and SP1), familiarization phase primarily focused on ICT, while in other pilots ICT was seen as instrumental to the pedagogical approach, rather than an objective in itself. The activities therefore also ranged from purely ICT focused activities (downloading software, trying out web services) to discussions about students' interests and possible project proposals. In most pilots, familiarization included an activity that resembled the 'Dream board' activity (NL2), which required students to represent dreams, interests and ambitions by means of a digital or non-digital tool. Students at MIX Academy (NL1) had to apply with a motivation letter and include a portfolio, which was discussed during a personal intake by the principle teacher. The familiarization phase lasted between one and three weeks, depending on the start date of the pilot.

Sharing interests online and connecting with other students was an elementary part of the project. Students were asked to share their interests through the Facebook group, and provide suggestions for topics and proposals for projects they'd like to do with other participants. By the end of the familiarization phase, all students were supposed to be part of a project. The team formation, at the end of the familiarization phase, was expected to happen in a more or less self-organized way, and was facilitated by the participating teachers. There were no restrictions on the topics or content or output, except for the second pilot in Austria, where teachers suggested that students would choose a topic that was more in line with the goals of the educational program and official curriculum.

At the start of the international project phase, several process guidelines were provided to ensure that students would work in sync and that proposals would be ready at the same time. In Austria and in Italy, teachers used a relatively structured approach with pre-determined steps and activities, while in other pilots, students had more autonomy in choosing topics, and were given more responsibility to define their own tasks, and guide their own learning. Students were encouraged to share updates about their projects on Facebook and connect and discuss with the other participants. At the end of the international project, presentations were organized (using Google Hangouts) to allow students to present their results to their peers, both locally and internationally.

After the international project, students were encouraged to continue with their international project, or choose a new project topic, which in some cases was restricted to a limited number of topics. In Italy and Austria, teachers provided structured assignments that were closely linked to the formal curriculum, with little autonomy to the students. In the Netherlands, students were allowed to continue with their projects, or start a new project that was not necessarily related with the curriculum. In Greece, Spain, and Portugal, student projects were related with the curriculum as well as the students' interests, and teachers facilitated the process of doing a project.

The final integration phase often included reflective activities, and experiences were discussed and the potential for integrating reAct into the formal program. In many pilots the focus was on ICT, and its potential uses in education, and less on the pedagogical implications of the reAct pedagogy. The potential of interest-based learning was shown in the Netherlands, Spain, Austria, and in Greece, where teachers used students' interests for designing assignments, activities, and internships. The potential for self-organization and structured self-guidance was shown during the second pilot in Spain, when two teachers were invited to a conference in France. Instead of re-scheduling reAct, they decided to allow students to self-organize the classes with only online support every two days.

Finally, in most pilots (NL2, AU, IT, PO), especially the second pilot phase, examinations hampered the commitment and attention for reAct activities.

As explained earlier, teachers and partners in each context interpreted the approach and its principles in slightly different ways. Some focused on (the potential of) ICT and emphasized the various uses of ICT in the implementation, while others were more interested in exploring the pedagogical principles of the reAct approach. Each of the case studies provides a detailed account of the pedagogical approach, including a synopsis of the main pedagogical principles in tabular format. Table 31 below offers an abridged overview of the different approaches in terms of activities, content, and direction to demonstrate the variety and focus of different pedagogical approaches. We refer to the individual case study chapters for more detailed information about the pedagogical approaches.

Table 31 - Activities, Content, and Direction

	Activities	Content	Direction
PO	Collaborative exploration ICT toolbox Share & connect Class discussions and reflective activities Assignments Collaborative student projects	reAct pedagogical principles, students' interests and curriculum topics.	Teacher- & participant-directed Support for collaboration, project work, planning.
SP1	Collaborative exploration ICT toolbox Share & connect Collaborative student projects (inquiry-based) and collaborative assignments	Both related with students' interests and curriculum plus strong focus on ICT	Mostly teacher-directed Limited support for self-guidance and project work.
SP2	Collaborative exploration ICT toolbox Share & connect Collaborative student	Focus moving from reAct pedagogy & ICT to students' interests to curriculum (with	Teacher- & participant-directed Support for collaboration, project work, planning.

	Activities	Content	Direction
	projects, inquiry-based. Assignments. Self-organized classroom (one week) with online support.	integration of ICT and reAct pedagogy).	
IT	Share & connect Collaborative student projects (inquiry-based) and assignments	Both related with students' interests and curriculum plus strong focus on ICT	Mostly teacher-directed Limited support for self-guidance and project work.
GR	Collaborative exploration ICT toolbox Moving from competition to collaboration Share & connect Reflecting on pedagogy Many out-of-school and inquiry-based, self-directed, collaborative activities. Collaborative integration and reflection. Professional networking and internships. Assignments.	Both related with students' interests and curriculum.	Teacher- & participant-directed Support for collaboration, project work, planning, presenting.
AU	ICT activities Collaborative assignments Focus on discussing the relevance of activities.	Mostly related with the curriculum.	Mostly teacher-directed, except for int. project. Limited choice (ICT, project topics). Limited support for self-guidance and project work.
NL1	Personal intake Personal projects Group reflection sessions Earning while learning: selling art and doing 'real' client projects Inquiry-based learning Personal branding Portfolio management and networking Visiting events Organizing events Professional workshops Reflection on education.	Students' interests and identity as starting point for creative process and teacher support. Curriculum focused on art and design (history and theory). Practical workshops focused on specific art/design skills.	Mostly participant-directed. Support for creative tools, self-reflection, goal-setting, project work, planning, brainstorming, specific skills.
NL2	Share & connect Student projects Branding assignments	Mostly related with students' interests	Mostly participant directed, more support for 'slow' students.

	Activities	Content	Direction
	Internships and exploring relevant academic institutes.		

Testing and summative assessment can have a negative impact on motivation to learn (Guisbond & Neill, 2004). The original reAct framework, therefore, suggested formative assessment procedures to support students in developing relevant skills and knowledge, rather than formal testing. In practice, as shown in Table 32, different assessment strategies were followed in the different contexts, depending in part on the institutional context, available time to prepare assessment frameworks and templates, and the commitment of teachers.

In SP1, IT, and NL2, assessment was limited to informal feedback during classroom sessions. Teachers indicated that they needed more time to understand and reflect on all the learning processes that were implicit part of the learning approach, and to define relevant and useful assessment rubrics. It was suggested that these rubrics were necessary for pointing out and making the learning more explicit to students.

In Portugal, the teachers did find time to prepare templates and self-assessment forms. These were developed in collaboration with the students and addressed communication and research skills. In Austria, after a disappointing first pilot, reAct was 'integrated' into the regular curriculum quite early on in the second pilot. This implied that teachers were able to use the regular resources and assessment tools and frameworks that had been developed before. These were not comprehensive enough, so additional assessment criteria were developed, in collaboration with the students, addressing presentation skills, self-assessment of relevance, and collaboration. Students were allowed to submit and present their projects to be graded as part of the final exam. In Spain (second pilot) and Greece, templates with clear tasks helped students progress, and assessment was aimed at these tasks, and at individual project-work, activity level, attitude and group work. Students were asked to share updates about their projects through e-mail and Facebook, such that all teachers involved were up to date about the students.

In NL1, assessment procedures were relatively comprehensive. The school had developed an assessment framework with the following categories: i) Mentality & Motivation; ii) Exploration & Analysis; iii) Effort; iv) Pace of production; v) Skills & understanding. Each student received personalized feedback focused on improving a certain skill or attitude and there were collaborative reflection sessions. Usually the feedback would start with the 'creative choices' made by the student, and then reflect on those choices ('Why did you make that choice?'). Students were not graded and did not receive certificates; rather, students were encouraged to build their own personal brand, including a high-quality portfolio, sell art online and on self-organized exhibitions, and to get to know professionals and to develop a professional network. Despite being co-located, mentoring and peer-based learning

did not take off, due to a lack of clear guidelines and absence of motivation to do that.

Table 32 - Assessment across Pilots

	Assessment procedures and focus
PO	How: self-assessment and templates Focus: communication and research skills
SP1	Limited assessment
SP2	How: project updates through e-mail/FB – teachers offered personalized feedback – templates Focus: attitude, collaboration skills
IT	Mostly summative assessment (rubrics and grades)
GR	How: informal discussions and personal feedback – integration of reAct in final grade – templates – mentoring
AU	How: collaborative feedback sessions, early and tight integration with formal curriculum (using standardized assessment), optional grading Focus: relevance of activities, presentation skills, collaboration skills, attitude
NL1	How: personalized feedback, unstructured peer-support and assessment, collaborative reflection sessions, comprehensive assessment framework, branding and networking, portfolio, selling art Focus: i) Mentality & Motivation; ii) Exploration & Analysis; iii) Effort; iv) Pace of production; v) Skills & understanding.
NL2	How: self- and group assessment Focus: presentation skills, branding and identity

5.2.3 The use of ICT

ICT was a core part of the reAct approach in most pilots, but the approach per case was quite different. In Italy, and to some degree in Greece and Spain, ICT was seen as an objective, rather than as an instrument to support the pedagogical process. Teacher training and familiarization activities were mostly focused on exploring different tools. In the other pilots, ICT played a more instrumental role with regard to the pedagogy. In NL1, ICT was not considered a very important element in the educational process, but it *did* support many processes, including organizational processes, promotion and personal branding, communication and collaboration, online content during workshops and lectures. Learning how to use tools like Photoshop and Illustrator was an important element in the curriculum.

We also looked at whether or not the institution had an ICT strategy, what kind of ICT infrastructure was to be used during the pilots, and the kinds of experiences they had with the use of ICT. This is described below and summarized in Table 33.

MIX Academy (NL1) had no formal ICT strategy or support system, but it was an integrated part of the education. Teachers used ICT ad-hoc and whenever needed; YouTube and other websites to provide examples in class, email to communicate

with students, and Facebook and the school's website to share updates about MIX and to promote student projects. The website was managed by a team of students. At Berlage (NL2), the school had just started to explore ICT as a core part of the educational experience: some cohorts (not the pilot group) were given iPads as the main device for learning, and teachers were given training to learn how to teach using iPads. None of the other institutes had a formal ICT strategy, and generally there was very limited experience with using web-based content and services as part of the educational program. In some pilots (Italian pilots and the first Spanish pilot) there was a very strict ICT policy, limited to no experience with the use of ICT in the classroom, and skepticism and a general lack of confidence in the use of ICT. In these contexts, the emphasis on ICT was considered very novel.

Having one's own laptop or tablet allows students to personalize the working/learning environment, store passwords, and take it home, but teachers have less control over the apps or websites that are being accessed or downloaded by students. Public computers, on the other hand, are under the control of the teachers or institution, but are often not available or accessible for students, and are restored to default settings after use. In some pilots (Portugal, Spain, Austria), students received laptops to be used during the pilot and at MIX Academy (NL1) students were required to have their own laptop and bring that to school (BYOD: Bring Your Own Device). In other pilots, students had to use either public computers available in the school's ICT room or their own devices. Internet access and bandwidth also differed considerably: in Greece, at the time, Internet was sometimes unavailable due to power outages, and in Spain (first pilot) and Italy (both pilots) there were – initially – restrictions on which websites could be accessed, including Facebook, which was used for communicating with other participants.

Table 33 - ICT Strategy, Experience, Attitude, and Infrastructure

	ICT use & experience	Attitude towards ICT	ICT infrastructure	Internet access & speed
PO	Administrative	Neutral	ICT room	No restrictions Slow/moderate speed
ES1	No	Skeptical	Laptops	Some restrictions Slow/moderate speed
ES2	Administrative	Open	Laptops	No restrictions Slow/moderate speed
IT	Administrative	Skeptical	ICT room	Some restrictions Slow internet
GR	No	Open	ICT room	No restrictions

	ICT use & experience	Attitude towards ICT	ICT infrastructure	Internet access & speed
				Slow internet Unreliable access
AU	Administrative	Skeptical	Laptops	Some restrictions Fast internet
NL1	Creative software Promotion and branding Communication	Open	BYOD	No restrictions Fast internet
NL2	iPad education	Open	ICT room	No restrictions Fast internet

We also collected data about the kinds of tools students and teachers chose to use during the pilots and what for, which is shown in Table 34. The following tools were used most often: office productivity tools, such as Microsoft Office and Google Drive, for preparing documents and presentations about the project; Facebook to connect with peers and teachers; YouTube to find and share content; Glogster to make a digital multi-media poster representing a student's interests; and several tools for a specific purpose (e.g. design a house, teaching math, etc.). The table below provides an overview of the tools that were used most often in the different pilots.

Table 34 – Activities and Tools per Case

	Activities and Tools
PO	Preparing: collaborative (teachers and students) exploration of the ICT toolbox Use: document creation and sharing (Google Search, Drive, Dropbox), communication and collaboration (Facebook, Google Plus and Hangouts), creativity, online magazines and presentations (ISSUU, Prezi, Powerpoint, MovieMaker), maintaining a portfolio (Google Sites website maker), and specific tasks, such as designing a house (using Floorplanner).
SP1	Preparing: collaborative exploration and curation of ICT Toolbox (choosing and describing, translating, and annotating a set of tools) Use: Facebook, a teacher blog, photo-camera, YouTube, Powerpoint, Google Docs, online mathematics website/open educational resources
SP2	Preparing: collaborative exploration and curation of ICT Toolbox Use: communication and collaboration tools (including Facebook, Google Plus, email, Google Translator), creative tools (Glogster, Moviemaker, Prezi), information management (Diigo).
IT	Preparing: activities related with concept of personal learning environment Use: presentation tools, blogging tool (by a teacher), writing (Google Docs), translating (Google Translator), communication and collaboration (Facebook and Google Hangout)
GR	Preparing: curating the toolset, installing desktop tools (due to poor reliability of Internet network) such as MS Word and Powerpoint. Use: writing and presenting (Powerpoint), writing and sharing (Google Drive, Google

	Activities and Tools
	Sites), video-sharing (YouTube), communication and collaboration (Facebook), translating (Google Translator), flipping the classroom (using USB sticks and DVDs). Due to slow Internet, the focus was on desktop tools.
AU	Preparing: limiting the number of tools before the pilot. Use: presenting (Prezi, Powerpoint), mindmapping (Mind42), learning English (BBC language learning), creativity (Strip creator), sharing updates and homework (Google Blogspot) and content management and collaboration (Moodle). Facebook was discouraged.
NL1	Preparing: no specific ICT training or preparation. Only support for creative tools, such as Photoshop, Illustrator, and Lightroom. Use: personal communication and sharing class notes, updates, issues and reminders (email), promotion of the school, students, and teachers (school website on Wordpress – managed by the students), video-sharing and content (YouTube and Vimeo), creativity (Photoshop etc.), communication and networking (Facebook), portfolio management (Dribbble).
NL2	Preparing: limited preparation time Use: communication (email, Facebook), presenting, writing and surveys (Google Apps – part of the school's ICT infrastructure, Prezi, Powerpoint), inspiration (Pinterest), creativity (Glogster, readmo.re), video-sharing (YouTube), surveys (Google Forms), video-editing (Final Cut Pro).

5.3 What were the results in each context?

Results, as often happens in experimental approaches, were mixed. We saw promising results in Spain (in particular pilot 2), Greece and Portugal, while the effects were limited in the Netherlands (pilot 2), Austria, and Italy. A comparison of results and likely causes follow below in the final two sections of this chapter.

5.3.1 Students: Impact and appreciation

Students reacted on the introduction of the reAct approach with excitement and anticipation. Students were drawn by the novelty of the approach, the international element, and the opportunity to choose and work on a topic. Engagement level remained high during the initial familiarization phase, which consisted mostly of relatively easy tasks and exploratory activities by students into topics of interest. Then, in some pilots, activity level dropped after the unsuccessful attempt to facilitate international collaboration. Some students were disappointed by the lack of (instant) feedback after posting an update online. Many students became frustrated after unsuccessful group formation and ineffective coordination of group work. There were several groups that consisted of students from different countries, but in general, there was limited interaction in these groups, and it was mostly relatively shallow: sharing videos online and adding short comments. In some groups, several attempts were made to come to a project proposal and tasks, but this was mostly unsuccessful. The difficulties of international collaboration caused many students and teachers to focus on local collaboration and local projects. A more

successful international element were the final presentations (through Google Hangouts), which were attended and executed with much anticipation and excitement. For example, in Portugal, students acted very committed to prepare their presentations and got dressed up for their final presentations.

The interest-based approach engaged most students, but not all students were able to stay engaged with their topic: students became distracted when exploring their topic, were unable to formulate specific targets or define steps to meet goals, or were just not committed enough. Students who received support and guidance by teachers to explore the topic appeared to be more engaged.

Student engagement tended to increase during the local projects, because students, often facilitated by teachers, made more progress and perceived the learning activities to be more relevant. Teacher involvement was higher as well. Student engagement with reAct activities was consistently high in Greece and Spain (P2).

Formal examination was the main focus during the final phase in AU, IT, NL2 and SP1, with limited time for reAct activities and student projects. Although engagement was high during this phase, the attitude was more passive as students were preparing for their exams.

The table below describes, per case, the engagement level of students, and the reported impact on skills and attitudes, and their appreciation of the project. Survey data was combined with feedback from teachers (interview results) and partners, and the teacher logbooks.

Table 35 - Impact on Students

	Engagement level and attitudes	Impact on students' skills	Overall appreciation students
PO	Overall high engagement – lower during final integration phase. Collaborative attitude, responsible, confident and committed.	Inquiry, collaboration, communication, leadership, self-guidance, self-assessment skills	Very positive, especially about the interaction with teachers and the relevance of the skills addressed by the approach.
SP1	Mixed engagement – low during int. project / high during local project. More serious attitude, positive interaction with teachers, confidence.	Project management, collaboration, communication, inquiry skills	Positive, especially regarding opportunity to determine the topic.
SP2	Overall high engagement – some frustration during int. project. Attitude towards teachers, belonging, pro-active, collaborative atmosphere,	Project management, collaboration and communication (negotiation, consensus seeking), ICT skills, self-organization.	Very positive about all aspects of the approach.

	Engagement level and attitudes	Impact on students' skills	Overall appreciation students
	self-confidence and self-esteem, pride, less fear of speaking in public, commitment, resilience, punctuality, responsibility, different perspective on learning and on ICT, better attitude at home.		
IT	Limited engagement – only high in the beginning of both pilots. Limited impact on attitudes.	Limited	Neutral – students wanted 'normal education'.
GR	Overall high engagement – less engagement at the end of P2 (examination period) Pro-active and entrepreneurial attitude, grit during int. project, confidence, positive, collaborative, higher academic ambition.	Inquiry, communication and collaboration, presentation, project management.	Very positive about all aspects of the approach.
AU	Limited engagement – high at start of P1 (new laptops, new approach) and towards end of P2 (final presentations). Improved attitudes among half of the students.	ICT skills, communication and presentation, inquiry,	Mixed: half of the students was positive.
NL1	High engagement. Self-awareness and self-confidence. Realistic expectations with regard to a career in art or design.	Art and design-related skills, communication and presentation, personal branding and networking, entrepreneurship, reflection.	Mixed appreciation: positive about the fundamental principles of the approach, less about the organization and curriculum.
NL2	High engagement in the beginning, less towards the end. Improved self-confidence, ambition, having developed a relevant academic or professional interest, sense of belonging, self-esteem.	Communication, writing, language, presentation, inquiry.	Mixed appreciation: positive about the approach, less about the organization and implementation.

5.3.2 Teachers: Impact and appreciation

In most pilots, teachers volunteered to participate in the pilot, and most demonstrated an interest in combatting disengagement among at-risk youth and the pedagogical approach that was proposed. In addition, there was strong interest among teachers to explore new ICT tools, and many of them had never used ICT in the classroom before. As such, the projects started with much excitement, but also some anxiety, because not all teachers felt prepared to implement the reAct approach. Teachers from Portugal, Spain (especially P2), Greece, and Austria, were engaged throughout the project. Understanding the nature of the reAct project as an experiment that required local adaptation and flexibility seemed to have an impact on how teachers dealt with barriers and difficult periods. Most teachers understood they were participating in a pilot that explored a new approach, and rather than expecting immediate success, they were interested in learning from it. Teachers in Spain (P2), Portugal, and Greece were oriented towards learning from the experience and were better able to address and cope with setbacks.

The project had a positive impact on teachers' ICT skills, which was not surprising; many had ever used ICT in the classroom. Even when expectations were completely met, teachers reported to have learned from the approach and to have a broader perspective on teaching. They felt better equipped to address disengagement and students' lack of confidence with more personalized teaching approaches and a better understanding of (some of) the reAct pedagogical principles. There was much appreciation for the more intense collaboration with colleagues, which was a result of the reAct approach.

More specific outcomes and experiences per case are described in the table below.

Table 36 - Impact on Teachers

	Engagement and impact teachers	Understanding	Appreciation and impact
PO	Generally teachers were very engaged and motivated until halfway the second pilot, the lower engagement due to fatigue, student resistance, and upcoming exams.	Good understanding of the reAct principles, due to consistent teacher training, learning, and discussions with colleagues. Confident to continue with approach	Very positive about 'new' interaction with students, new teaching strategies, and ICT. Teachers (five out of six) indicated that the project 'had altered their view on teaching'.
SP1	Average engagement, and lower during int. project. Teachers were selected to participate by management.	They considered it difficult to implement reAct, in particular the design of activities that addressed self-guidance and project-based work.	Positive about 'better understanding risks and merits associated with the use of ICT', having a more diverse teaching approach, and the relevance of the approach in relation to

			preparing for employment situations
SP2	High engagement throughout the entire pilot.	Good understanding of the approach and ability to implement their ideas (e.g. the 'self-organized classroom').	Positive - Very positive about the focus on self-guidance and self-organization by students.
IT	Limited engagement, due to limited time and support (P1) and limited teacher motivation (P2).	Limited understanding.	Neutral, but teachers were more positive about having more experience with the use of ICT in the classroom.
GR	High engagement throughout the entire pilot.	Good understanding of the approach and ability to balance structure and self-guidance.	Very positive about developing useful new teaching skills, in particular related with facilitating self-guidance, ownership, and the use of ICT.
AU	Mostly engaged, except during the examination period.	Average understanding, due to the more formal approach, and limited self-guidance and creativity.	Positive, especially about i) having improved ICT skills and knowledge of the benefits and risks associated with various online tools (in particular Facebook); ii) having developed a new teaching approach and assessment method.
NL1	Engagement generally high, but was affected by students' dissatisfaction.	High understanding among core teachers, less among invited teachers / professionals.	N/A
NL2	Mostly engaged, except for examination period and after the international project (when students resisted to continue).	Average understanding; high commitment to understand the principles, but very little time to implement and reflect on approach.	Positive about i) changing teaching perspective: pilot helped to reflect on the educational process and own teaching; ii) improved understanding of student-centered approaches; iii) more confidence in the use of ICT for learning, and more awareness of the risks involved (distraction, information overload); iv) value of teacher collaboration (in contrast with 'regular teaching' that was considered too solitary)

This chapter was a next step towards analyzing the implications and value of the reAct approach to engage at-risk youth. The comparative tables demonstrate a variety of implementation contexts, approaches, and outcomes. By putting these together, a better and more comprehensive and practical understanding has emerged of 'the reAct approach'. The next chapter will take this step further, synthesize these findings and converge towards analysis, identification of principles, and the design of the pedagogical design framework.

6 A Design Framework for Engaging At-Risk Learners

Following the cross-case comparison in the previous chapter, here we further integrate outcomes and insights with the objective of building a pedagogical design framework to engage at-risk youth in different educational contexts. The first part, sections 6.1-6.3, is the analytical process of synthesizing the results with regard to context, organization, and pedagogical approach. Contextual factors and organizational conditions that influenced the design and implementation of the reAct approach are described.

Based on the analysis, we then continue with the construction of the framework in section 6.4, which aims to answer the core research question: *"How to engage at-risk youth in educational contexts?"* The following steps were taken to come to the design of the framework.

1. In depth case-study analysis – see chapters 4.1 to 4.8.
2. Cross-case comparison in chapter 5, resulting in relevant insights and a comprehensive overview of the variety of cases in terms of educational setting, organizational support and integration, and pedagogical approach. Relevant results were written into tables to prepare the case comparison.
3. Rigorous procedure for development of the framework addressing the relationships between context, implementation, and results.
    a. The context analysis was focused on determining relevant institutional factors and the role of stakeholders. The relation between the institutional context and the organization and content of

the approach was described as well as the influence of the main stakeholders on the conditions in which the pilots were conducted.

b. The analysis of the organization and pedagogy (together "Implementation" in Figure 27) focused on comparing the effects (on engagement, skills, appreciation) of the various approaches and the organizational decisions and factors that facilitated or hampered these approaches.

4. Combined, these analyses resulted in eight principles to support the design, implementation, and evaluation of a pedagogical approach to empower at-risk learners in different educational contexts to take control of a learning process based on interest.

A simplified diagram of the analysis approach is shown in Figure 27.

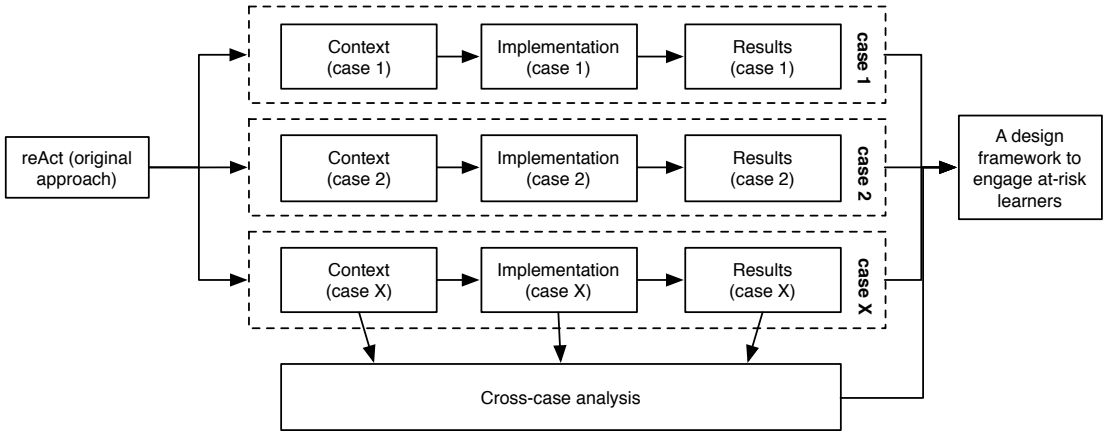

Figure 27 - Analysis Approach

6.1 Context analysis

In this paragraph, we reflect on the context of each individual case, and highlight the factors that influenced implementation, as they emerged from the case studies and previous chapter. For each of the factors, the significance is explained, and its relationship with other factors.

6.1.1 Institutional Context and Conditions

In more formal institutional environments, such as in Italy, Austria, and the Netherlands (pilot 2), the existing regulations and curricular objectives made implementation and integration of the approach more difficult. The institutional conditions in these environments prescribed a focus on the regular curriculum, which meant that reAct was organized as an add-on to the regular program, limited to three to five hours per week. As a consequence, students and teachers focused more on the regular program than on the reAct activities. For the teachers involved, it meant that they had relatively little time to invest in learning about and preparing a new pedagogical approach. This led to limited support and guidance for 'self-

guided' activities and project work as well as a more traditional, teacher-led approach that focused on curriculum topics.

In pilots where the institutional conditions were less formal, and where the curriculum supplied considerable time for informal learning activities and content, such as in Spain and in Greece, teachers invested more time, and experienced less restrictions, which enabled them to embed the reAct approach and pedagogy into the program. On the other hand, there was a clear need for a more formal quality or assessment framework. This would not just help them in assessing their own and students' performance, but would also help them communicate the relevance of the reAct activities to the participating students, colleagues and management.

Contextual conditions were also determined by available resources and facilities, i.e. availability of ICT hardware, support and financial resources, and the school's geographical context. Various teachers creatively converted apparent limitations into opportunities. For example, in Greece and the Spanish pilots, Internet speed was low. Therefore in Greece, and to some extent in Spain as well, teachers decided to primarily use desktop tools, resulting in fewer ICT problems, distraction or delays when working with ICT. Secondly, poor connectivity had the beneficial effect that ICT sessions were well prepared, resulting in more deliberate and focused use than in other pilots.

At MIX Academy (NL1), limited resources (organizational, financial) offered an opportunity and need to run the organization of the institute with shared responsibilities. They were responsible for several organizational, promotional, and day-to-day tasks, and some were even involved in acquisition activities and the design of the curriculum.

The local cultural, historical, and physical environment, including cultural artifacts, history, the local city, regional events, constitutes an opportunity to extend the classroom experience. Extra-institutional activities and exploring and interacting with the world beyond the classroom, i.e. visiting historical sites, interviewing people, inviting professionals, cooking traditional recipes, challenged and engaged students consistently in several pilots (GR, NL1, NL2, SP1, SP2).

We have combined and categorized the most important institutional context factors, leading to the comprehensive overview in Figure 28. The diagram visualizes both the institutional factors that condition a pedagogical approach and organization *as well as* demonstrates potential opportunities to make the learning (more) engaging.

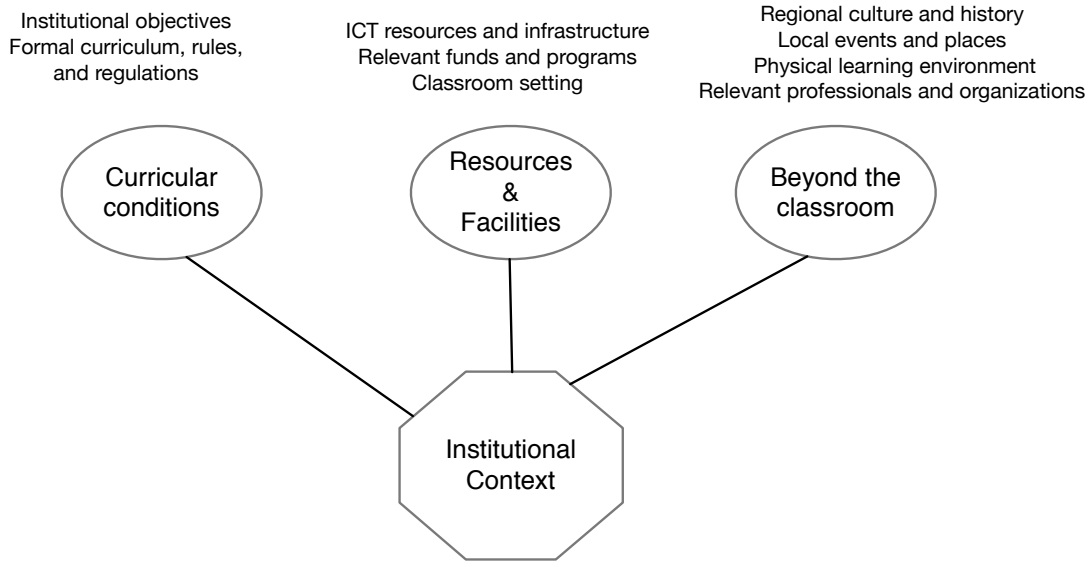

Figure 28 - Institutional Context Factors

6.1.2 Stakeholders

Implementation of a novel approach within an existing formal or non-formal educational institute does not happen without explicit or implicit support of management, the dedication of teachers, and the willingness of students to participate. This section describes the outcomes of the analysis of the involvement and influence of the main stakeholders on the implementation and effects of the approach.

The involved partners played a significant role in several cases. It should be noted that the framework proposed in this chapter should be directly usable in different educational contexts, preferably without needing support from an external partner. Therefore, it helps to identify the role of the partner in the implementation, such that teachers and managers are aware of their role when they decide to use the framework proposed in this chapter.

Partners who were 'close to the action' (for example in Portugal and Greece) had a positive influence on the dedication of teachers and the quality of the approach: they encouraged teachers and offered suggestions with regard to the design of the activities. The partner was responsible for translating the initial approach, and for convincing teachers and management to participate. Translating was not merely translating from one language to another, but from one context to another: the partner added his or her own interpretation to the translation of the pedagogical approach, resulting in a distinct focus per case. The most important distinction concerned the interpretation of ICT, and whether or not it was seen as an objective in itself, or a means to meet pedagogical goals. To facilitate the correct adoption and 'translation' of the proposed framework, it emphasizes pedagogy and its relation to the use of ICT more deliberately than the original 'reAct approach'.

Support from *management* is beneficial, or, according to some teachers, essential for effective implementation. Management who decides about resources, time or additional remuneration for teachers and can use their authority to publicly endorse the approach, for example by showing up during classes or explaining the approach and by taking interest in the efforts made by teachers. At the same time, this is a way to implicitly and informally hold teachers accountable. Finally, they can either restrict the efforts of teachers, or give them autonomy to explore the approach. In most cases the manager was very supportive in discussing the approach with the teachers, and how to assess the activities.

Teachers are responsible for the design of the approach and its implementation. They interact with the target group on a daily basis and have the power to influence their engagement and participation. We saw limited differences in commitment, creativity, and approaches within individual case studies, probably because the reAct approach required a high level of collaboration between teachers. Within single case studies, we did see how participation had different levels of impact on different teachers, depending on their perception of relevance of the approach for their own classes and courses. Between case studies, differences were more significant. For example, involvement and commitment of teachers in Italy was limited, while teachers in pilots such as SP2, GR, and PO were highly committed and engaged. Other differences included the mindset teachers had with regard to the appropriate approach for students, their perceptions about students' abilities and intelligence, and previous experiences and ideas about education. Staff development should depend on teachers' attitude and interest in the approach, their pedagogical knowledge, relevant skills and experiences and preferences and personal goals. Attitude and commitment depended on the expected value of participation, which related with perceived relevance to address disengaged at-risk learners and its potential for broader implementation (other cohorts and formal education). Professional relevance and recognition were important incentives, and were sustained by providing a certified teacher training, being explicit about its potential to improve professional skills, new career opportunities, and offering networking opportunities. Staff development is further elaborated in section 6.2.2.

Students could be categorized into adolescents (16-18 years) and young adults (18-25 years). Older students were relatively more serious about their career and future, while the younger aged students seemed less occupied with employment or careers. Older students were more sensitive to their goal of obtaining certification, and therefore appreciated learning activities that were more clearly linked to the formal program. All students wanted get a diploma or certificate and most said they were committed to obtain it. A smaller number of students showed intrinsic interest in the educational content of the program they were enrolled in (NL1, SP1&2, GR). The orientation towards obtaining a certificate, similar to achievement orientation (Senko & Harackiewicz, 2002), often conflicted with effective and engaged

participation in reAct activities. Especially among students with a more traditional orientation towards education, there was a tension between the extrinsic curricular requirements (other classes) and the intrinsic desire to explore one's own interests.

Perceived relevance was – in part – related with a student's personal perspective on education, which was sometimes influenced by their cultural background. There were students who described learning as a process of knowledge transfer from teacher to student, and students who were more open and used to interactive approaches in which students play a more active role.

Many students were uncertain about their own ability to perform well and had a fear of failure. This was appropriately addressed with familiarization activities that started with small and relatively easy tasks that gave students a sense of self-efficacy and ownership. Two other effective approaches were i) letting students 'teach the teacher' about a topic they knew more about (i.e. Facebook), and ii) to find shared interests between teachers and students, such as a football team or cooking.

A student's initial attitude or confidence level did not seem to predict performance and engagement later on. There were students who were initially seen as troublemakers with very little self-confidence, but who became the most active and engaged students with a very positive influence in class. On the other hand, there were students whose initial attitude and confidence level did not change much, and who resisted against participation throughout the pilot. In addition, there were students who were enthusiastic at first, but became disengaged after not being able to progress much or were not committed enough to overcome barriers.

More important were the 'level of interest' and skill level of students. Students were asked to propose one or more topics of interest, but the 'level of interest' between students differed greatly. Some students expressed a deep interest in a particular topic and were eager to explore it even further, while others were only superficially interested, resulting in a shallow exploration that was limited in scope and quality. Students who had already been interested in their topic for years, often knew what they were doing, were clear about their goals, and most importantly, and had a stronger desire to share their interests, ideas, and dreams. It suggests that many students require guidance to get from a superficial interest to a deeper understanding of a topic and its complexities, or that some need more time and flexibility to choose a truly relevant topic. More about the principle of interest-based learning can be read in sections 6.3.2 and 6.4.1.

Shallow interests and limited skills were the biggest obstacles for meaningful participation. Not all students possessed the appropriate skills to participate effectively; they required structured guidance to progress, were not familiar to work in teams, or did not know how to use ICT to their benefit. An effective familiarization phase should address the skills students possess, in particular their information literacy, research skills, creative skills, ICT skills, language and

communication, collaboration and project-management skills. Evidently, this implies that teachers master these skills as well. Figure 39 in section 6.3.7 describes the use of ICT to support the above processes. The illustration below illustrates the main stakeholders, their role in implementation, and the factors that influence their role.

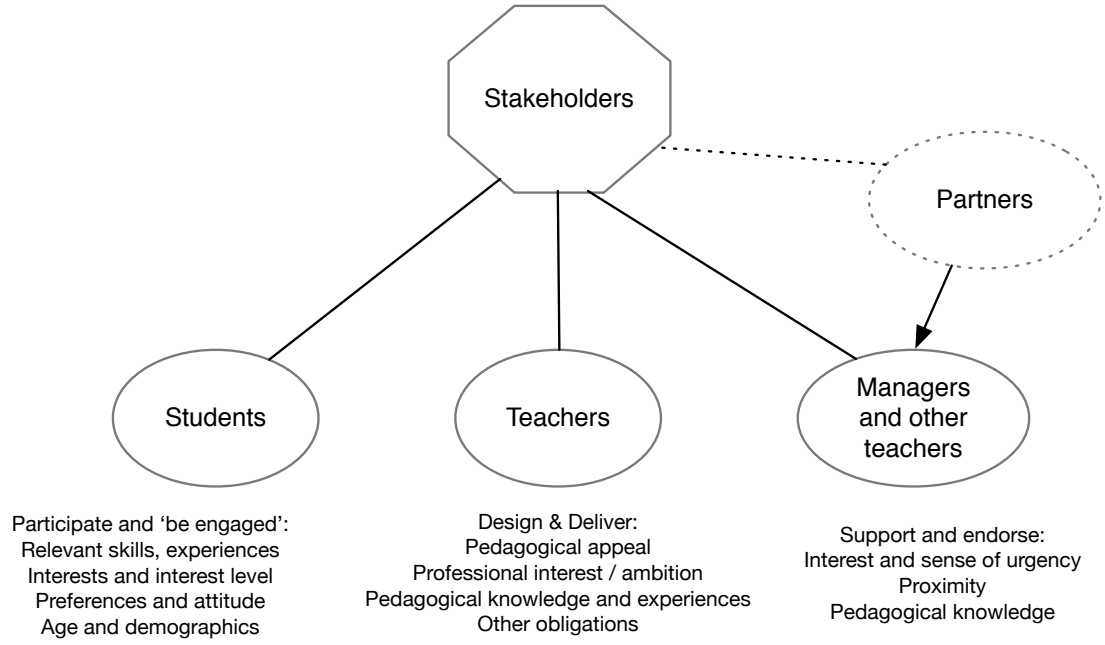

Figure 29 - Stakeholders: roles and factors

6.2 Analysis of the Organization

The sections below describe the outcomes of the comparative analysis of the organization of reAct in each of the cases. Organization addresses teacher training and support, and the organizational integration of the pilots.

6.2.1 Integration level

In pilots with limited *integration*, reAct was organized as an extra-curricular activity that was done in addition to the 'regular curriculum' and scheduled for only 4-8 hours per week. Highly integrated pilots, such as GR, SP2, and PO, were appreciated more by students and teachers, and had stronger effects on students' self-confidence and engagement. Being limited to 4-8 hours per week, as we saw in Italy, NL2, and Austria, implies that students have other things to do, and on their mind, for most of the time. Much of the 'reAct work' had to be done at home, which was hard to combine with the obligations of the regular curriculum. Students considered the regular curriculum as less ambiguous and easier to follow than the exploratory and self-guided reAct activities. Especially during the examination periods, students' interest in reAct and engagement went down, which was understandable when you consider the importance of the certificate or diploma for most participants. What made it even more difficult was the fact that, in some pilots (including NL2 and IT), these hours were distributed across various days and time-slots. Every 'reAct hour', students needed some time, sometimes half an hour (when working in the ICT lab),

to get into the flow of the project they were working on, to establish their goals for the session or to get support from a teacher.

In various pilots (NL1, GR, PO, SP1, SP2) relatively much time was allocated for reAct, and as a result students had, during the initial phases, much freedom to pursue interests unrelated or indirectly related to *curriculum topics*. In Austria, experiences in the first pilot encouraged teachers to align and structure activities in line with the regular curriculum during the second pilot. The data indicate that curriculum alignment seemed to increase students' perception of relevance, while reducing the perceived control over their learning activities. Overall, students appreciated a link to the curriculum, but in a way that still left them relatively autonomous and free to decide about direction and content.

Teachers in all pilots expressed a need for more management support and time to integrate reAct in the existing program and curriculum. An important instrument to facilitate integration was the development of an *assessment framework* that recognized students' efforts. Integration was done differently in different pilots, with more emphasis on the use of ICT (AU, SP2, GR); the integration of collaborative and self-guided activities (GR, SP2, PO); and a different assessment approach (AU).

Teachers in various pilots suggested that the reAct approach would also benefit from more integration with other classes, meaning the *involvement of other teachers*, to create a wider, more comprehensive palette of relevant activities, projects, and topics that could be covered in other classes as well. In some pilots, including the second pilot in the Netherlands, and in Italy and Greece, we have seen examples of how other teachers, not directly involved in the reAct project, participated and contributed to the experience in their own class.

6.2.2 Staff Development

Early (voluntary) *involvement of teachers* in the preparation of the pilot contributed to the quality of learning activities, teacher confidence and commitment. If possible, skilled and experienced other teachers with relevant experiences can be invited to participate as mentors: in Greece, former 'reAct teachers' (from P1) were important in explaining the approach and convincing teachers in the advent of the second pilot. In the Netherlands (P2) and Spain (P1), and Italy, teachers were invited only a few weeks before the pilot started, which created more pressure, and made teachers initially more skeptical and resistant. The time pressure made it difficult to transfer the ideas behind reAct and its pedagogical principles, and gave teachers less time to prepare activities.

The *focus of the training* was similarly important. In Italy and Austria, for example, teacher training was primarily focused on ICT, which resulted into activities aimed at exploring or using a certain ICT tool, but lacked a solid pedagogical foundation. Teacher training should include practical examples of the (more theoretical) pedagogical principles, in particular with regard to self-guidance and ownership,

and help teachers develop skills that were considered essential facilitating students and implementing the reAct approach. The training should prepare teachers to address difficulties related with project management, coordination, the use of the Internet (as a teacher) and the effective use of ICT (by students), facilitating collaboration, and assessing students.

With regard to the *training format*, collaborative and explorative activities (such as the collaborative exploration of ICT tools) were successful in engaging teachers. Teachers were engaged in a process of co-creation, of learning and reading about the approach, discussing the approach with colleagues, exploring the ICT tools, and designing and testing activities.

6.2.3 Support

In Portugal and Greece, where the partners were more directly involved in the pilot (as managers and teacher trainers), there was a consistent *high level of support*, with positive effects on the teachers' commitment and effectiveness. In Italy (IT2), a high level of partner support resulted in lower teacher engagement. Mentors were arranged to support the Italian teachers, but teachers saw this as an opportunity to withdraw from the pilot and attend to other priorities. They were not made *accountable* for their participation and thus were able to reduce their commitment and efforts to make the pilot a success, knowing that their mentor would step in, which is aptly described by the psychological theory of *backup plans* (Shin & Milkman, 2014). In addition, management was not involved, which reduced relevance of participation for teachers, and at the same time there was no one who would hold them accountable, which is explained by *moral hazard* theories (Diamond, 1989). Some form of accountability seems necessary to ensure teachers' commitment. This may be done implicitly, by taking interest in the approach, discussing progress and issues with teachers, and recognizing teachers for their efforts.

Most teacher-support was organized as *peer-support*. Peer-support and collaboration with colleagues was necessary for ensuring a consistent learning experience, to share experiences and updates about students, and to prepare activities. In addition, it was a very important motivating factor for teachers. Many of them were not used to collaborate with colleagues, and were thrilled about the possibility of exploring something interesting and creating something new together. Despite attempts, there hardly was any interaction between the teachers from different pilots, which was one of the reasons that inhibited effective international collaboration between students. First and foremost, this had to do with the same reasons that inhibited international collaboration between students: language and a lack of coordination. Only a few teachers were proficient in English, and with limited coordination or protocols that supported the communication between teachers, teachers did not engage with international peers.

The illustration below describes the most relevant organizational factors; the factors that influenced on the pedagogical approach and its effects (i.e. appreciation, engagement, perceived relevance).

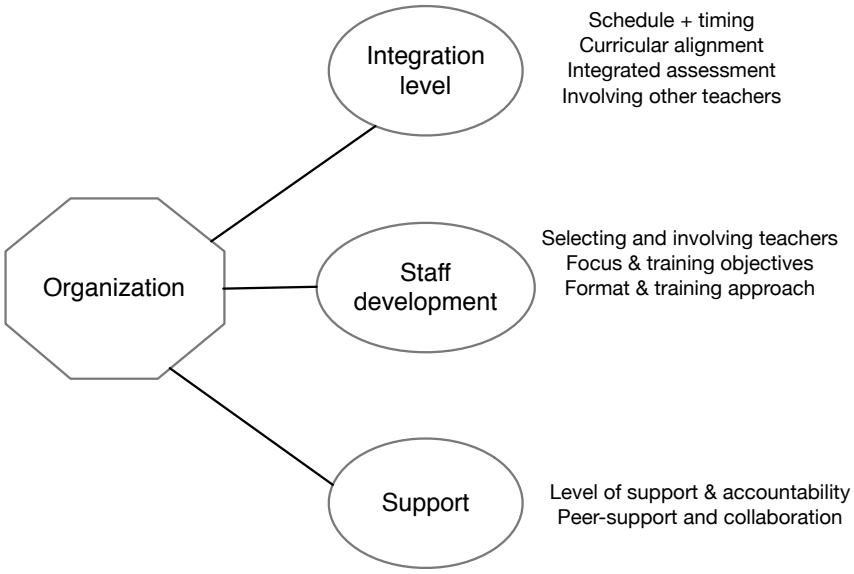

Figure 30 – Relevant Organization Factors

The previous analyses concerned with the institutional context, stakeholders, and organization have been combined into the comprehensive diagram in Figure 31, which provides a high-level overview of relevant conditions and organizational factors. As indicated by the arrows, institutional context and the stakeholders determine organization (as defined by support, integration, and staff development). This implies that to appropriately organize the reAct approach, the context and stakeholders must be understood. The diagram can be used as a first step to determine the goals of an educational intervention based on the reAct principles.

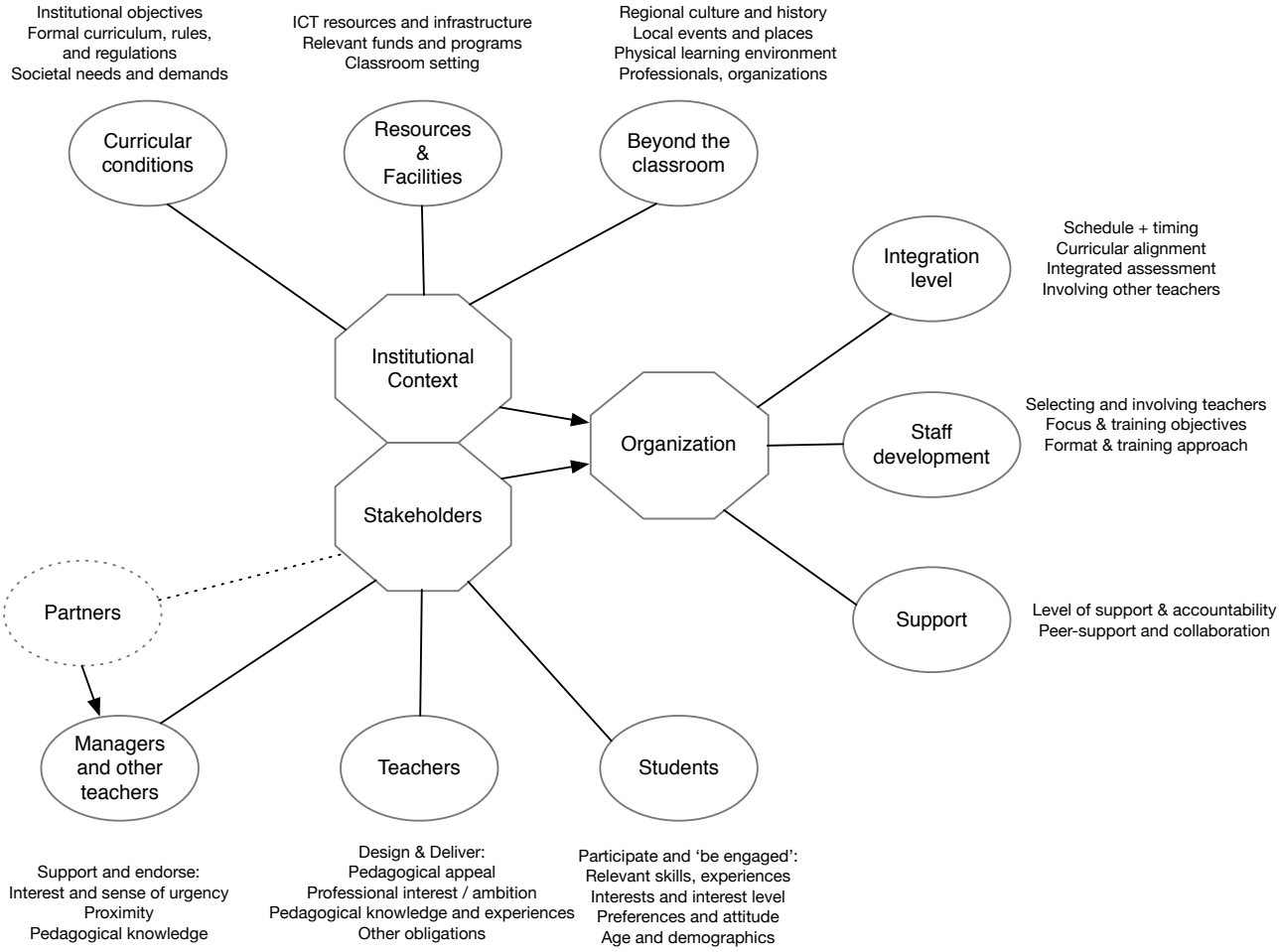

Figure 31 - Institutional Context Factors and Stakeholders' Profiles determined the Organization of reAct Pilots

6.3 Analysis of the Pedagogical Approach

The following sections combine results from all cases and analyze the pedagogical approach, with the objective of developing a new, improved set of pedagogical principles and design guidelines to effectively implement these principles. The analysis of the pedagogy of reAct, as will become clear, does not strictly follow the original set of reAct principles. Instead, first a categorization was made of the pedagogical principles that were *actually implemented*, based on all the data collected. For instance, although 'interest-based learning' was not an explicit principle in the original reAct approach, it was foundational in many implementations. Principles that were not reported or discussed in interviews, logbooks, and survey responses were omitted. However, it must be said that the principles analyzed below largely reflect the original reAct principles, which implies most teachers did not do something entirely different.

6.3.1 Summary of the reAct Pedagogical Approach

All pilots started off well: the novelty of the approach, in particular the focus on ICT and the international aspect appealed to most students. Many felt proud to be part

of an international project, and in some pilots, giving students their own laptops to work on reinforced this feeling. Students started to share their interests and interact using Facebook, which allowed teachers, even much further along into the pilot, to interact with students in a more personal and personalized manner than students were used to, thereby fostering a level of trust and mutual understanding and feeling of belonging. Students' engagement was positively affected when autonomy to choose a topic and work on projects was balanced with effective and structured support. Assignments that encouraged students to go out and inquire further amplified engagement and participation. Finally, the sharing with peers online boosted students' interest and engagement and participation in the 'final presentation sessions' and presenting projects increased their self-confidence. Not all students were engaged, and differed between different cases, as projected in Figure 32.

In pilots with more teacher presence and process support during all consequent phases, student engagement was higher (SP2, PO, GR). In other pilots, consistent support was lacking, and students who struggled with the autonomy and freedom became less engaged.

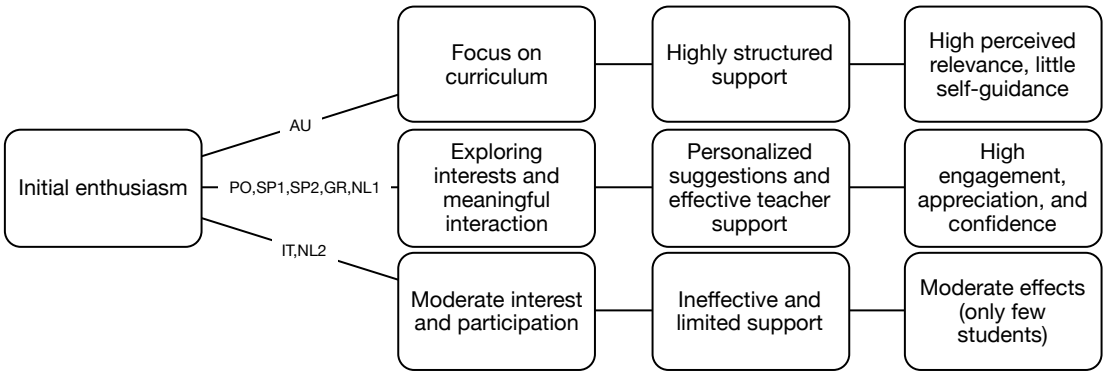

Figure 32 – Teacher Support and Outcomes

Intrinsic as well as extrinsic motivations were used to engage students. The intrinsic component relates to the fun and personal significance of exploring a personally relevant topic (alone or with others), the joy of creating something or solving a problem, the experience of doing something new, and the thrill of going out on their own and feeling responsible. The extrinsic component essentially relates with the perceived relevance and value of participation.

Collaborating and interacting with peers and teachers addressed intrinsic as well as extrinsic motivations. Many students were motivated by the opportunity to work and interact with others, to have a shared goal, to solve a problem together, and to talk and discuss things they liked about, online and offline. An important incentive for students, negative as well as positive, was a need for confirmation by others. Most students, especially younger ones, were sensitive to feedback. In practice, this meant a strong desire to instantly receive 'Likes' on Facebook after posting

something, indicative of low self-esteem that may be further amplified through Facebook use (Gonzales & Hancock, 2011). The interaction with teachers was similarly geared towards confirmation, and in particular belonging. Taking personal interest in a student's project had a positive influence on the student's sense of belonging.

The main demotivating factors were students' inability to progress and a negative perception of the relevance or value of participation, sometimes reinforced by peers. Self-guidance was more difficult than expected, and without teacher support, many students disengaged. An overview of intrinsic and extrinsic motivations as well as demotivation factors are integrated in the diagram in Figure 33.

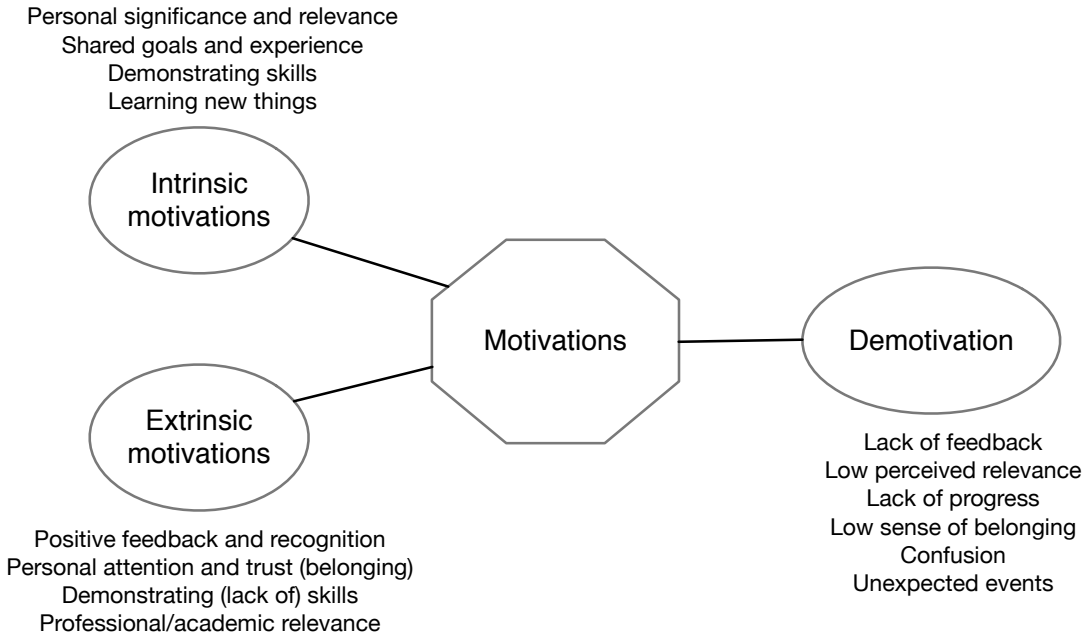

Figure 33 - Intrinsic, extrinsic, and de-motivation

The following paragraphs present the most important pedagogical elements and principles that were actually implemented and had a significant effect. These effects, in terms of (dis)engagement and appreciation are discussed as well as the practical implementation of the principles.

6.3.2 Taking students' interests as a starting point

Giving students the opportunity to explore a passion or topic of interest was a very powerful element in the approach and engaged many students. By allowing students to reflect on things they cared about, their participation grew, because their focus moved from formal education towards topics they were confident about, also known as a process of self-affirmation (G. L. Cohen & Sherman, 2014). Asking students to share their interests online, or to represent their interests using a digital tool, allowed teachers to personalize the way they interacted with their students. For example, teachers suggested resources to students that related with their interests,

recommended specific educational careers and schools, connected students with professionals in a relevant field, and arranged possibilities to do an internship within a particular area. In addition, teachers were able to interact with students on a more personal level, because there was more understanding of each other's interests, ambitions, and occupations. This was widely appreciated as a critical success factor, because it led to an increased sense of belonging of students.

However, as most case studies point out, the mere opportunity for students to investigate or create something related with their passion or interest was rarely enough. A significant limitation was the apparent superficiality and lack of profoundness of proposed interests. Students would propose something trivial, like an interest in cars, football, or music, but were then unable to explain any relevant intricacies or a deeper personal significance of the topic, which inhibited them to set meaningful goals. We agree with Renninger and Hidi (2011) that, rather than to rely on affective components of interest and merely *"focus on the momentary psychological state of interest without considering further reengagement"*, teachers may also inquire about the cognitive aspects of students' interests (i.e. asking about what they already know about the proposed topic). This notion is further supported by reports that more engaged and progressing students were those who were able to express their interest in a more elaborate way and explain how it related to them, and who demonstrated a deeper understanding of the topic. These students were better able to define relevant personal goals, and maintained their engagement longer than their peers with less significant interests.

Overall, the novelty of the approach created a positive, but temporary impulse. Especially when the difficulty of self-guiding and self-organizing a (collaborative) project became apparent, activity level went down. Instead of researching their topic of interest, these students got distracted more easily and spent their time watching videos online, chatting with friends, or playing games online. In turn, this had a negative effect on perceived relevance of reAct, as they understood that their 'participation' did not contribute anything meaningful.

It should be noted that it's not the superficiality of a topic itself, rather the superficial understanding or knowledge of the topic by the student that matters. For example, a Manga project initiated by a few Italian students resulted in nothing more than some discussion on a Facebook Group page about favorite characters (IT), whereas two students in the Netherlands (NL2) performed much better: they developed a survey on Manga and collected over 100 responses from class mates, teachers, and other students. In addition, they researched the history of Manga and its role in Japanese society and culture. They developed a beautifully visualized presentation that combined their research and an impressive self-made Manga comic, and presented their work online and in class (see NL1, chapter 4.7). They were in similar highschool environments with only a couple of hours per week reserved for reAct activities, but the difference in commitment and effort between

students in Italy versus the Netherlands (NL2) was enormous. This Manga student project (NL2) required very limited support from teachers, and just a little encouragement, because the level of interest and understanding of the topic of these two students was already very significant at the beginning. Similar experiences were reported and seen across other cases.

We identified four dimensions of interest in relation to the principle of relevance. The four interest dimensions are illustrated in Figure 34. In the center is the individual "Learner", and the outgoing arrows signify underlying motivations directed at each of the dimensions.

1. **Self.** An interest in 'self' relates with students' need to develop an identity that reflects personal interests, ideas, and culture; a need to self-express; and a desire to maintain and protect the integrity of self (G. L. Cohen & Sherman, 2014). A learner's personal interest can be in any of the dimensions, but ultimately, in order to sustain the interest, it has to be congruent with the (perceived) self or personal identity. Personal, intrinsic interests were often not readily known to students, and were the result of a process of discovery, inquiry, and creativity.
2. **Others.** Students, especially the younger students, were sensitive to their direct social environment in the classroom, which was mostly driven by a need to belong and to be recognized by peers and teachers. It emphasizes the social context and need for understanding the social dynamics in the (digital) classroom that influence students' interests and engagement, and students' need for an identity that can be afforded publicly. Some teachers, in particular in Greece, seemed aware of this aspect and deliberately involved 'key students' in pedagogical strategy.
3. **Institute.** Students had selected or joined an institute or school with a desire and objective to feel competent and to have a career (in a particular area), and the intrinsic interest in the curriculum topics and enjoyment of learning. It also relates with the need for relevant feedback and to be recognized or certified according to externally valid standards (i.e. accredited assessment framework).
4. **Society.** An interest in society reflects the students' interest and motivation to contributing to a higher goal and social causes, which relates to the field of 'pro-social behavior' and the notion of altruism (Batson, 1987). Often, this emerged from personal experiences and status, including many students from families with a low socio-economic status, and migrant youth whose lives had been changed because of inequality, corruption, or oppression. Some students, especially in Greece, were driven by patriotism and wanted to generate a positive view on their country in response to the mostly in negative coverage at the time.

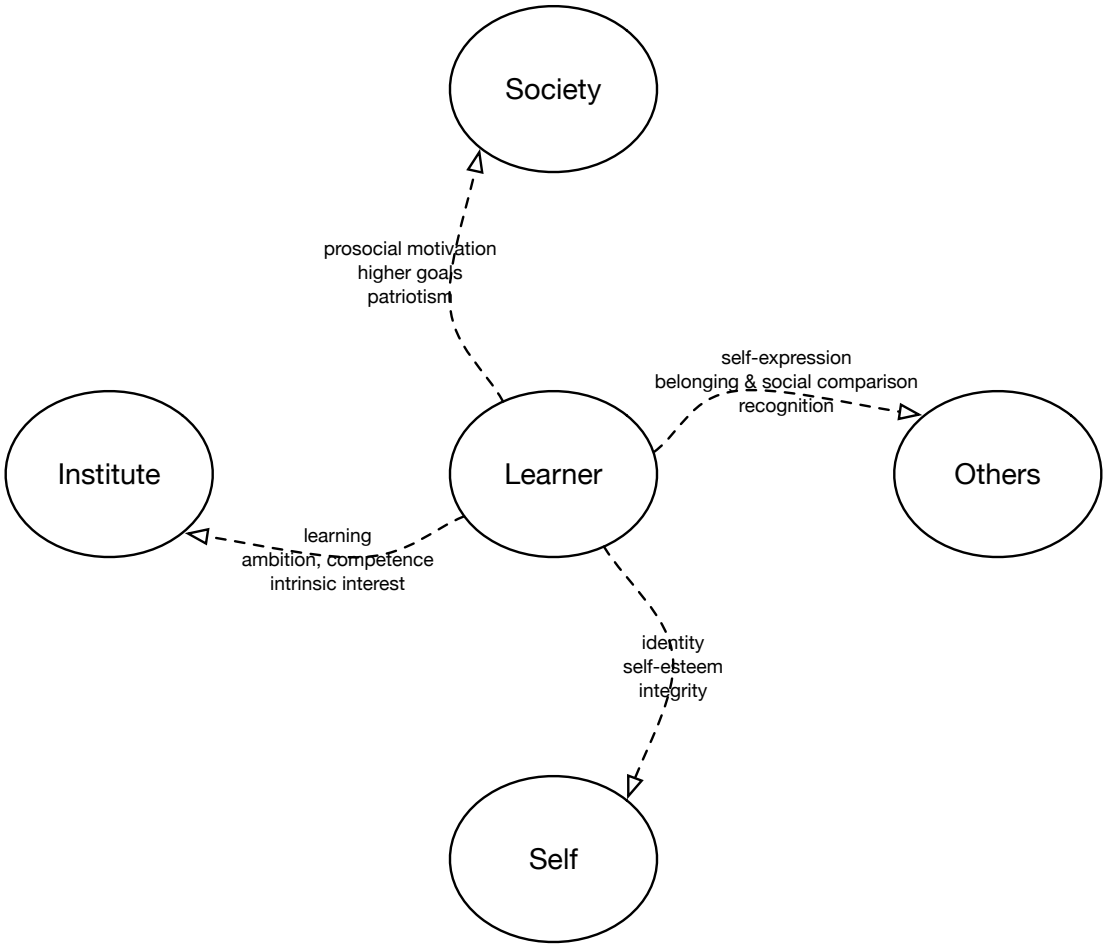

Figure 34 - Four Dimensions of Interest

6.3.3 Adding and sustaining relevance

As can be inferred from the analysis is a strong relation between relevance and interest. Relevance in education refers to *"learning experiences that are either directly applicable to the personal aspirations, interests, or cultural experiences of students (personal relevance) or that are connected in some way to real-world issues, problems, and contexts (life relevance)"* (Abbott, 2013). These areas of personal and life relevance are reflected in the 'Four Dimensions of Interest' model, depicted in Figure 34. This section describes how teachers facilitated application of learning experiences in relation to these interests, in other words: how teachers added relevance to (learning) activities. The outcomes of this analytical step were added to the described four-dimensional interest model, and illustrated in Figure 35.

Self. Allowing students to choose a topic, set objectives and self-guide and organize learning processes, as opposed to teacher-led transfer of knowledge and skills following a pre-defined curriculum, would facilitate identity development and 'force' students to ask question about self, about who they were and what they wanted and valued. One of the central strategies was to have students engage in a process of self-affirmation, which encouraged them to reflect on interests and values consistent with what they believed to be their identity and them share those interests publicly.

The use of creative tools to aggregate and present those interests visually using multi-media seemed highly effective. Significantly, time to explore, make mistakes, and reflect on choices, as we've seen in NL1 and the other well-integrated pilots, were essential in this process, as well as the autonomy to choose a topic, and trust in others to feel comfortable to express interests. Other ways to sustain or to scrutinize students' interests was through collaborative reflection sessions, discussion, and personalized feedback from teachers.

Others. The perception of relevance was often influenced by what other students thought to be relevant. This is reflected in the high number of 'popular topics' with a social element to it, such as fashion, football, popular music, and cars. It also influenced the students' perception of the reAct approach. Several strategies were adopted to address social dynamics, including promoting positive interactions (online and offline), discussing relevance of activities in class, facilitating team formation and collaboration, mentoring, and the involvement of key students.

Institute. At the beginning of each pilot, students were primarily driven by the goal to obtain a diploma or certification that would increase their employability. Integration of reAct activities into the schedule (GR, PO, SP, NL1), and making students' efforts count with regards to the diploma or certificate, increased students' perception of relevance. In contrast, reAct objectives would compete with formal curriculum objectives in pilots where reAct was 'added' to the main program (IT, NL2, AU). Connecting activities and topics with the formal curriculum had a beneficial effect on students' perceived relevance, while unstructured self-guided activities often had a negative effect on perceived relevance.

In some cases, such as NL1 and SP2, assessment frameworks or templates were developed that supported self-assessment and peer-assessment. Many teachers expressed a need for a recognized assessment frameworks that addressed skills promoted by the reAct approach, including collaboration, project management, creativity, identity development, ICT skills, research and inquiry, and more. Such frameworks would allow teachers to refer to formally recognized terms, descriptions, and rubrics when designing or explaining activities, which was expected to increase the perceived relevance, especially with regard to students who have a traditional perspective on education.

Other ways to effectively increase relevance was by inviting professionals and industry experts, to facilitate visits to relevant organizations and (short) internships, and helping students build a portfolio or build a professional network. Students were also encouraged to maintain a portfolio and to build a professional network, which was facilitated by arranging interviews with relevant professionals.

Society. Few teachers anticipated to the high number of 'social and societal interests' expressed by students, which were enthusiastically shared on Facebook and during the final presentations. From this we conclude that the role of students

as 'activists' seems appropriate and offers a pedagogical opportunity. For instance, teachers could encourage students to communicate and promote their cause to others in a convincing way. An interesting example from NL2 was a 16-year old student from Tibet, who was known as a 'problematic student'. Teachers successfully helped him start a crowd-funding campaign to pay for a trip to an international conference on Tibet in Switzerland. He managed to obtain the necessary funds and went, which significantly empowered him.

Another way to increase a perception of relevance was to encourage students to explore the city, its people, institutions, and cultural artifacts and make those elements part of their projects. Students who participated in projects that went beyond the institutional walls, through the involvement of friends and family, or exploring and documenting artifacts from the regional or cultural context, were more active and engaged. Various examples are described in case studies NL1, NL2, and SP2.

Figure 35 visualizes all the above described methods and approaches to add and sustain relevance of activities using the same four-dimensional interest framework.

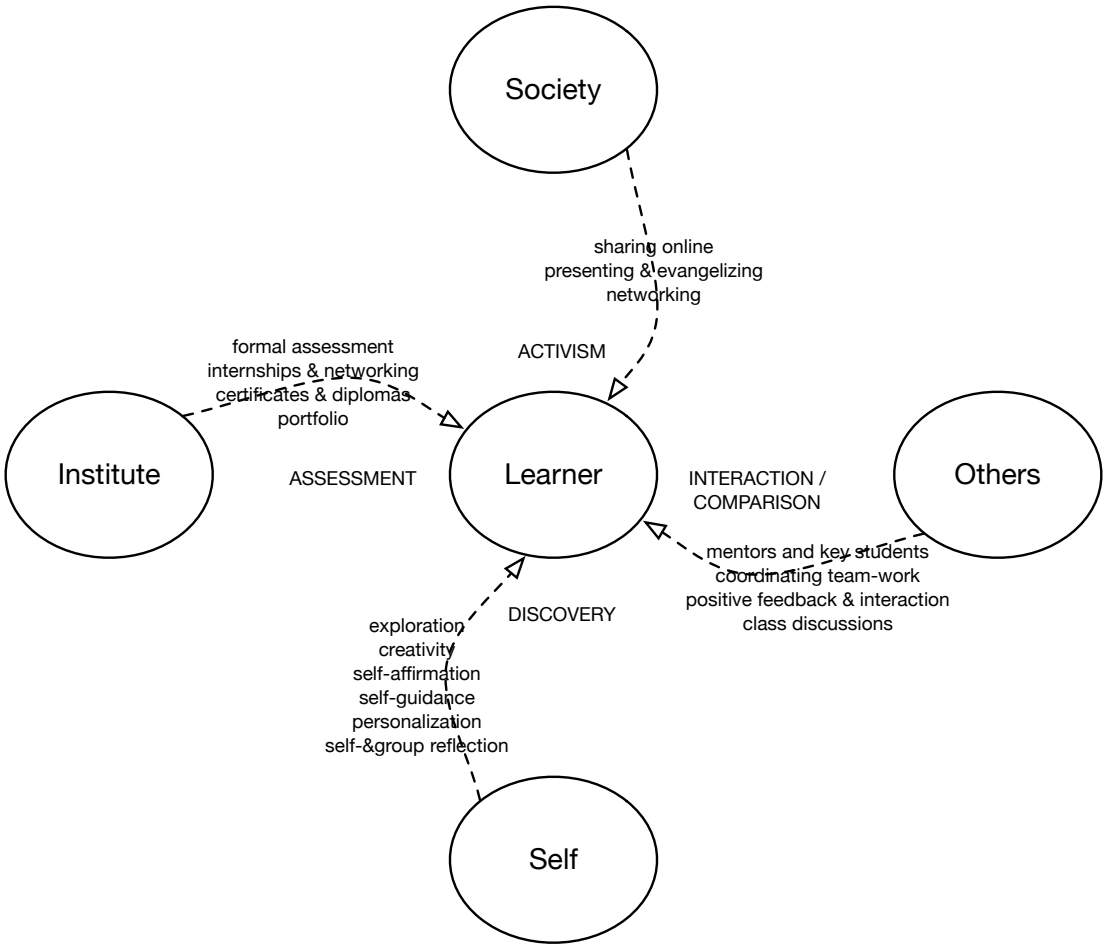

Figure 35 - Adding and Sustaining Relevance

6.3.4 Self-guidance and ownership

Self-guidance of learning activities addressed students' intrinsic motivation for self-determination (R. M. Ryan & Deci, 2000b), and was aimed to empower them to take ownership of the learning process. Various inspirational examples of self-guidance, self-organization, and self-directed learning and ownership have been reported, most remarkably in SP2 and NL1. In SP2, teachers allowed students to organize their own classroom sessions during an entire week, with distant teacher support through Google Hangout. In the NL1, students were in part responsible for the organization of the school, all possessed their own personal key to the school, and they were explicitly involved in the design of the educational program. In Portugal and in Greece, self-guidance had a positive impact on students, while in Austria, Italy, and the Netherlands (second pilot), results were more ambiguous with regard to self-guidance and ownership. Finding the right balance, for each student, between giving support and allowing student to self-guide their projects was a challenge for most teachers. A minority, less than 10%, of the participants appeared to flourish in a highly autonomous learning environment. Many however, lacked the appropriate skills and required structured guidance to develop their awareness and understanding of the responsibilities and processes involved in organizing and completing one's own project. The tasks and responsibilities, establishing realistic goals and project planning, researching a topic from scratch, coordinating collaboration (online and offline), communicating and making decisions about a project, collectively constituted a significant barrier to effective participation. A suggested approach of 'structured self-guidance' (as opposed to complete autonomy) is further supported by the more successful and appreciated local project phase in most cases. The pressure to give more structure was higher in pilots where there was little time for reAct, as compared to, for example, NL1, where teachers deliberately restrained from giving students assignments, even if (individual) students had been passive for weeks.

As a response on students' inability to move forward, teachers limited choice available to students, for example by restricting the tools to be used or the topics that could be chosen for their projects. In most cases, this was beneficial and helped students, which is in line with the notion of 'paradox of choice', popularized by the psychologist Barry Schwartz.[27]

With limited time explore reAct, teachers moved towards an instructor-led pedagogical approach, including assignments and formal assessment. Teachers

[27] His TED talk: https://www.ted.com/talks/barry_schwartz_on_the_paradox_of_choice

made an effort to increase the relevance of these assignments (see for example the *"Building your dream house"* activity in Portugal, chapter 4.1.3). These were assignments that were provided by the teacher, which meant that they were able to give more support and relevant suggestions as compared to most purely interest-based projects. Effective assignments were open-ended, contained elements of collaboration, tapped into students' creative potential, and related with students own (high-level) goals or ideas. As with the dream house activity, the additional advantage for teachers was that, once the assignment had captured the students' imagination, it was relatively easy to introduce relevant learning concepts.

As mentioned before, striking the right balance between structuring the tasks for students, and giving them autonomy, was a major challenge for teachers. Students rejected or resisted against both too much control and too much autonomy. We saw similar patterns in the various cases: Initially, students enjoyed high level of freedom to choose a topic and organize a (collaborative) project. Students appreciate this, but then, gradually, started to become frustrated due to a lack of progress. As a result, many teachers adopted more authoritarian approaches, but these tended to focus on content-based assignments rather than on supporting the process of self-guidance. Although this often resulted in increased students' activity level and perceived relevance, it also made students more passively involved.

The illustration below describes the principle of self-guidance and ownership in the context of reAct. Ultimately, successful application of self-guidance to sustain a sense of ownership and engagement (the output) depends largely on the skills of students to self-regulate the process, their attitude and perceived relevance of going through the process, and the teachers' anticipation on these factors through effective strategies.

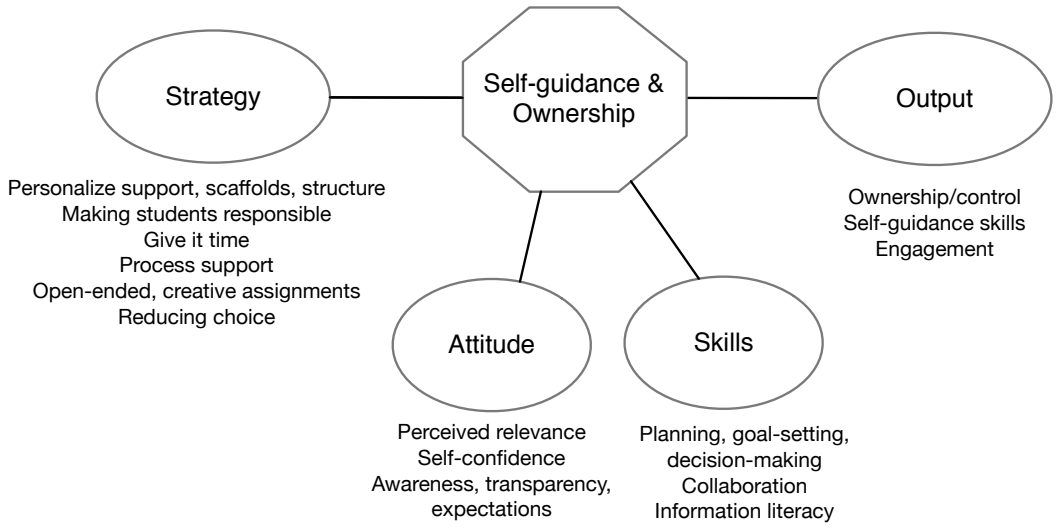

Figure 36 – Self-guidance and Ownership: strategy, moderating factors and output

6.3.5 Creativity

Creative processes were seen as learning objective (e.g., learning to use a creative tool) as well as instrumental (to increase engagement or to explore a topic). In some pilots, including SP1 and NL1, creativity was a core learning process; students were supposed to learn about, and practice, ceramics (SP1) and art and design (NL1). Secondly, creativity was instrumental in a process of self-discovery, whereby students and teachers collaboratively discussed the significance and meaning of a creation. Thirdly, the creative process could contribute to engagement; the immediate feedback of creating something and the ability to share your results appealed to the students. It should be noted that, frequently, ICT was in the way of the creative process, in particular unrestricted access to popular video-sharing sites like YouTube and social networking sites introduced a distractive element to the process.

Having a clear high-level goal for a project, for example 'making a documentary about Amsterdam', helped students to determine the tools they want to use, what they want to make, what information they need, and what resources are necessary. When students were undetermined, teachers limited options for students to induce more pro-active and creative behavior, and by structuring the creative task more as an assignment. Unrestricted access to the Internet, without specifying clear goals or offering substantial support, frequently led to inertia. Similar to the principle self-guidance, structure and preparation were important conditions for creativity. Figure 37 illustrates the process of successful introduction of creativity in reAct pilots.

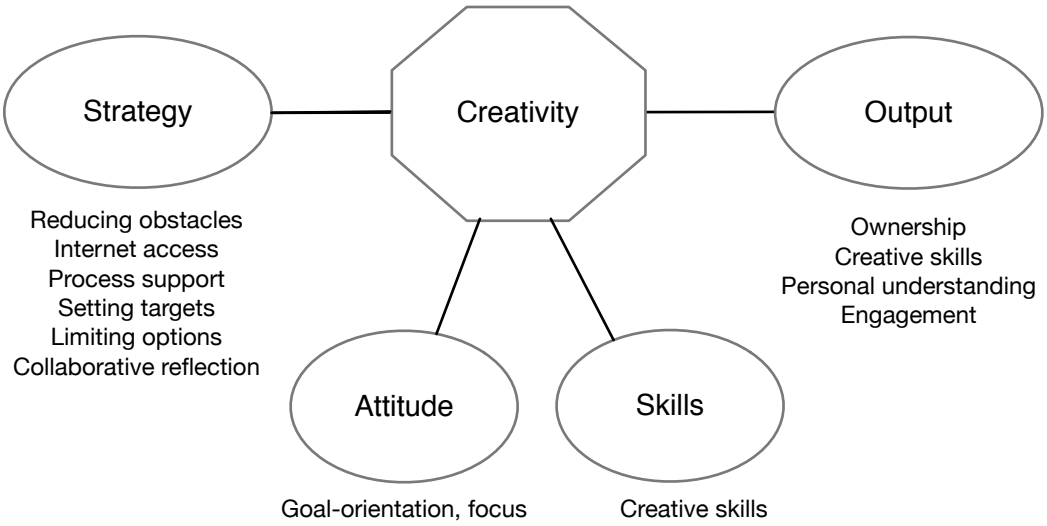

Figure 37 – Facilitating Creativity

6.3.6 Interaction and collaboration

The international aspect appealed to students, because they were curious about the other participants, were eager to share their interests, and in particular something about their country or region. Many felt as if they were part of something larger. In general, collaborative projects were more profound and resulted in higher

engagement than projects that were done by individuals. Shared decision-making, working *with* teachers on projects, and local collaboration helped foster a positive class atmosphere and a more trustful learning environment. Particularly engaging were the occasions when students assumed the role of teacher, and explained a tool, or a topic, to their teachers. In NL1 and SP2 even, students were empowered to self-organize their learning environment. Presenting one's work in front of a group, and sharing projects and updates with peers, especially in the international context (online and through Google Hangout), was an important engagement factor. Combined with the creative output, the collaborative activities, the act of sharing and presenting constitute the essential elements of a learning culture of a *constructionist* classroom (Papert & Harel, 1991). Presenting projects also challenged students and moved students out of their comfort zone, ultimately leading to higher confidence and engagement.

Encouraging students to do a project with students from other countries was an appealing concept, but difficult to put into practice. In addition to the language barrier, which reinforced the superficiality of the conversations, it was not clear to students how to form teams, and then how to go from sharing interests to preparing and executing a project collaboratively. The coordination was limited and fell short of what appeared to be necessary. Interaction with other students motivated students, but could also be very discouraging. Many students expected instantaneous feedback on their posts on Facebook, and were upset when no one replied or liked their contribution, with a negative effect on students' self-confidence. Research on how young people behave on Facebook, for example how they choose to represent themselves on Facebook in relation to self-esteem and confidence (Gonzales & Hancock, 2011), seems relevant in the context of reAct.

The impact of students' direct social circle (peers and friends from school) was also visible. Implicit social pressure was a significant factor that influenced students' motivation to participate or not participate. In several pilots, we saw how students engaged in a process of upward social comparison with regard to their own experience and the educational experience of other students not involved in reAct (Blanton, Buunk, Gibbons, & Kuyper, 1999).

Often, the views on reAct, and general perceptions, both positive and negative, were reinforced within their cohort, much in line with social constructivist theories of learning, which explain how meaning (including opinion!) and knowledge are socially constructed (Lave & Wenger, 1991). The students, especially those with little self-confidence and feeling stigmatized by 'being a dropout', resisted against participation when they realized that they were not succeeding, which is explained by theories of stereotype threat (Steele & Aronson, 1995).

In Greece, the social dynamics in the classroom were acknowledged by the teachers and used to encourage participation: influential students in the group were given

more tasks and they were implicitly involved in the organization of the pilot, which made them feel responsible and promote interaction among other students. In the second pilot, students from the first pilot were involved as mentors, with a positive impact on engagement and perceived relevance. The mentors demonstrated different tools and described their own projects, which helped students believe they were able to perform the same task. This is in line with Bandura's social learning theory, which stresses the importance of observational learning and vicarious reinforcement (Albert Bandura, 1971). In other pilots, this was attempted as well, but it was often a challenge to motivate students to act as mentors and they often did not know how to act as mentor.

Local collaboration was easier, more profound, less threatening and more engaging due to co-location, absence of language barriers, and better teacher support. It was easier to hold students accountable, to discuss and assign responsibility for specific tasks, and to align expectations and goals.

Jenkins' characteristics of a participatory culture can be used to evaluate the likeliness participation and collaboration to emerge (Jenkins, 2009). Jenkins describes that a participatory culture can arise when barriers to participate are low, there is support for sharing and interacting with others, there are experienced participants who are willing to convey their expertise to novices, contributions are likely to have an impact, participants feel socially connected. It can be concluded that many of these elements were better addressed during the local project phase as compared to the international project phase.

Based on our cross-case analysis with regard to the principle of collaboration and interaction, we come to the strategies, moderating factors (student skills and attitudes) and the output, as depicted in Figure 38.

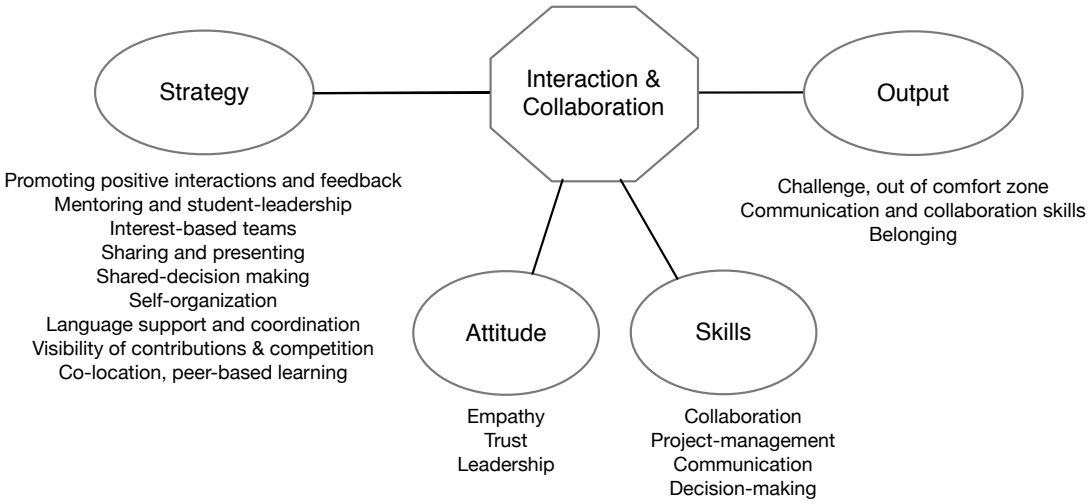

Figure 38 – Facilitating Interaction & Collaboration

6.3.7 Use of ICT

A variety of web-based and desktop ICT tools were used during the project, which served different purposes. The use of ICT in education was new to most teachers, and those with experience primarily used it for administrative purposes, such as presence lists and document management. The reAct toolbox comprised of a large variety of tools supporting creative expression, project management, collaboration, finding open educational resources, storytelling, video-sharing, research, educational games, photography, inspiration, web-design, DIY-projects, and more. In general, most teachers found the toolbox complex and difficult to use, and not suitable for use by students. Therefore, in some pilots, including the Spanish and Portuguese pilots, a local version of the toolbox was made that contained fewer tools and descriptions in the local language.

Table 37 combines the various common uses of ICT seen in different case studies.

Table 37 – Uses of ICT

Use of ICT	Description
Search	Searching information and (educational) content, usually with Google Search.
Translation	Translating websites and content with Google Translate.
Inspiration	Finding and sharing inspirational, interesting, and educational videos with YouTube, Vimeo, and TED.com or exploring inspirational websites, such as Pinterest and StumbleUpon.
Productivity	Collecting and writing down information using office productivity tools, such as MS Word, PowerPoint, and Google Docs, and MS Word.
Research & Analysis	Collecting, analyzing and visualizing data using Google Forms and MS Excel.
Collaboration and interaction	Team formation, discussing and collaborating with team members, and to connect with others through Facebook or Moodle.
Promotion and marketing	Promoting and marketing student projects (or the school or region) through blogs, websites and social media, such as Twitter and Facebook.
Creativity and storytelling	Creativity, presenting and storytelling, including Glogster (digital poster), Storybird (storytelling) and Animoto (creating stop-motion videos from pictures). More advanced creative tools like Final Cut Pro.

Benefits of using ICT

The use of ICT tools showed potential to engage students, in particular with regard to interaction and collaboration, creativity, developing a sense of ownership, and search and research.

Interaction and communication. Many students, and especially those who had personal devices, enjoyed the novelty of the ICT-rich approach and appreciated the new opportunities for interacting with classmates, teachers, and with unknown peers from other countries. Several tools, such as Pinterest and Glogster, showed potential of supporting students' desires to share and explore their interests. Combined with the interest-based approach, Facebook was a very powerful tool, because it contributed to a more personal relationship between teachers and students. Teachers suddenly had insight into their students' interests, ambitions, and social life. Facebook allowed students to easily control what they shared with teachers and offered a low threshold for interaction. Often, Facebook was a more effective way to reach students than 'traditional' email, which was used less frequently and less intelligently.

Online interaction on Facebook, in a local group as well as with students from other countries, had a mostly positive effect on students' engagement, despite the limited collaborative support it offered. Synchronous communication and video-conferencing (i.e. the final presentation sessions) were much liked, and engaged students more than asynchronous online interaction.

Creativity. Several ICT tools were very useful in helping students express their interests in a visual or creative way, for instance PowerPoint, Glogster and Pinterest. Students engaged in an exploration phase, collecting videos and illustrations related with students' interests, and then pasting or collecting those interests in a presentation, online poster, or online collection that could then be shared with others. Without guidance, only few students managed to demonstrate creative ICT skills that went beyond the 'exploring/collecting/sharing' paradigm, and used more advanced tools, such as Photoshop and Final Cut Pro, or just pencil and paper to produce more profoundly creative projects.

Self-guided exploration and ownership. ICT allowed students to work at their own pace, and let them explore the Internet in a highly self-guided manner, which increased their sense of ownership: they were responsible for the process, because they had the tools in their hands and they were able to find information about topics they had chosen. These effects were lower when tools did not work as expected, Internet was slow, or when restrictions were imposed by teacher or institution.

(Re)search. All students used Google Search to find and collect information and illustrations for their projects, but only few were using it effectively, indicating a need for support to develop their information literacy. Students also used Google Maps to identify organizations or places in the neighborhood that could be used for

their projects, and there were even some projects using Excel and Google Spreadsheet to conduct surveys and analyze data.

Despite promising examples of using ICT to support specific pedagogical strategies, and engaged students, we believe that the potential of using ICT was not reached. More support for ICT literacy and clear supporting guidelines for the use of tools are required. We recognize that most students would have benefitted from specific support for using ICT to facilitate collaboration, project management, advanced search and research, more complex creative activities and projects, and effective communication. Our experiences are, conceptually as well as phenomenologically, in line with flow theory (Csikszentmihalyi, 2008). It indeed should be the objective that students enter a state of flow when they are working on their projects, which has several implications on both the tools being used and the support being given. The figure below contextualizes our experiences within flow-theory and recognizes low-hanging fruit, which will likely engage students for a short period, and more advanced ICT skills which require more support to retain the initial engagement and to maximize the potential of ICT to facilitate a self-guided, interest-based learning process. Low-hanging fruit ICT are those tools that foster processes that any mortal can pick up without training and support. In all cases, the novelty of using ICT in the classroom appeared to engage many students, and no specific skill was required to enjoy those moments. However, quite soon students were encouraged to start with an international project, which would require them to be proficient in (online) collaboration and have advanced language and communication skills. Clearly, few students could cope with such difficulty level, which did not match their skill level. Figure 39 demonstrates the tension between difficulty level of the activity at hand, and the required skill level, for different reported ICT-based activities.

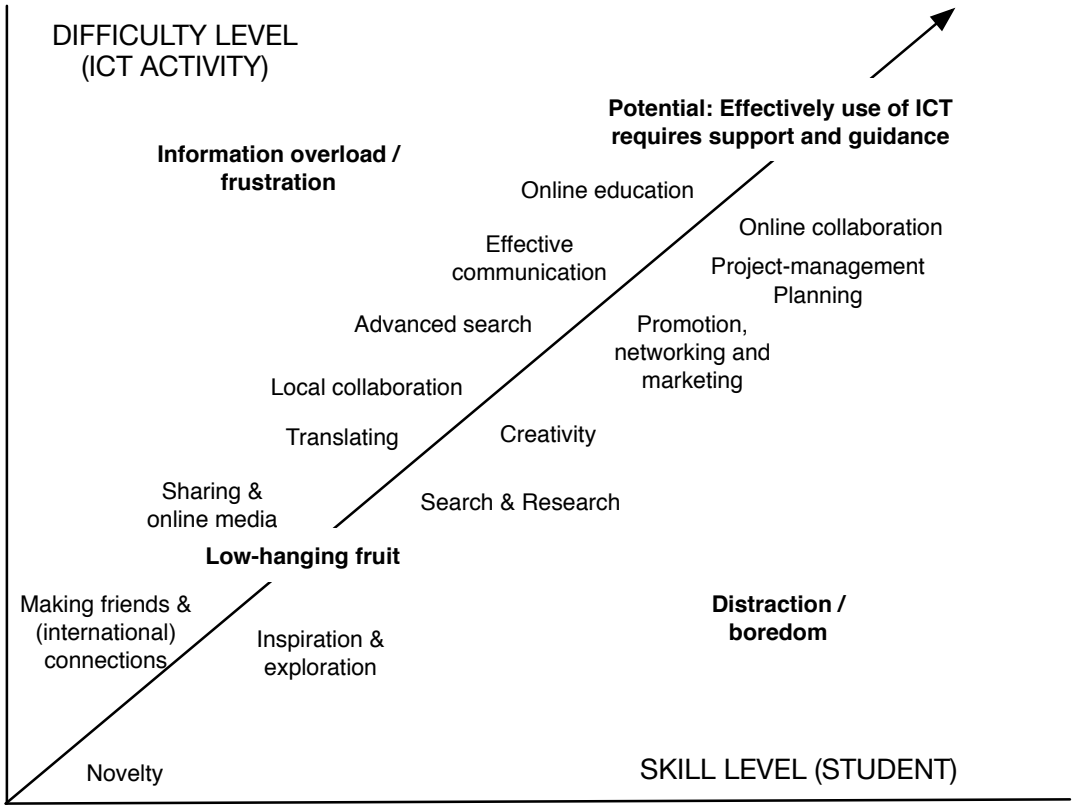

Figure 39 - Facilitating Effective Use of ICT for Self-guided Learning Activities

Barriers and obstacles to use ICT effectively

The original reAct framework described various potential benefits of ICT, and in particular the possibility of allowing students to use tools for self-expression, search and research, and more. A number of these benefits were realized, as described in the previous section. This section addresses the obstacles and barriers related with the use of ICT.

Startup time. Most of the suggested tools were web-based, and required registration and logging in. This was problematic, because quite frequently, students had forgotten their passwords, and were unable to retrieve it due to their poor email management skills (i.e. not using operators to search for emails, deleting all emails, not using filters, etc.). Having a personal laptop was therefore favorable: passwords were stored on the device and signing into services happened instantly, which also made sharing content easier. It also allowed students to personalize their computer and work more independently on their projects. In Austria, Spain, and NL1, students used a personal laptop to access websites and make use of the different tools, while in the other pilots students had to use ICT rooms (or 'labs') with public computers.

Distraction was a significant barrier, especially among already struggling, less committed and younger students. In NL1, students were older and highly dedicated towards their projects and personal development, and distraction was not an issue. Younger students were more easily distracted, and appealed, by Facebook and the possibility to interact with others. Teachers spent much time and energy in keeping

students from playing online games, chatting with friends, or just browsing websites mindlessly without any reference to a project or assignment.

In Greece and Austria, teachers encouraged students to use desktop tools when possible, which was considered more effective than online tools, because it limited distraction and time required for signing-up and logging into tools. In Spain and Portugal, teachers and students collaboratively explored the toolset in order to pick and choose only a limited number of tools that would be used during the pilot, which also made ICT use more efficient.

ICT literacy. Distraction was amplified by a lack of ICT skills. Students suffered from information overload and were not able to find or identify relevant information online, to search effectively, collect and categorize data, conduct an inquiry, or communicate (and email) effectively. This resulted in limited progress during ICT sessions and a low sense of achievement and relevance. Some students considered the ICT sessions as 'leisure activity'.

Many teachers were lacking useful ICT skills as well as this was their first experience with the use of ICT in an educational context. They were unaware of the variety of tools available online that could facilitate self-guiding interest-based collaborative projects and thus were often unable to suggest tools, or to help students master certain tools. Few teachers were knowledgeable and confident enough to offer effective support; the majority preferred to remain passively involved during ICT hours. On the positive side, in various pilots, students started 'teaching' the teacher about tools, e.g. how Facebook can be used.

Lack of feedback. Students were very serious about interacting on Facebook, and this could also lead to demotivation and disengagement. There was only one instance of bullying, but students generally complained and were discouraged when they did not receive feedback, or not quickly enough. Many students seemed to be very sensitive to feedback, comments and 'Likes' on Facebook, in line with research on self-esteem of young Facebook users (Gonzales & Hancock, 2011).

Language. Popular tools, such as Facebook, Google, YouTube and Microsoft Office offered localized versions, but others did confuse students who had poor English language proficiency. In several pilots, teachers therefore focused on tools in the local language, but the offering was relatively poor. At the same time, through translating websites and texts, students improved their English and even local language skills (as they were forced to provide the correct input sentence to get an appropriate and sensible translation).

Accessibility was another barrier, which includes connectivity speed and reliability of the network, institutional restrictions, and the quality of hardware being used. In several pilots (including GR, IT, SP1, SP2), these issues played a role, often resulting in frustration, because students had to stop working on their project, lost work, or progressed slowly.

Introducing and Facilitating Use of ICT

A recent OECD publication about students, computers and learning points out that a narrow focus on ICT may not benefit educational practice and outcomes (OECD, 2015). The report describes the relevance of ICT skills and how important it is to have an appropriate ICT strategy that addresses specific educational needs and problems that otherwise cannot be solved without ICT. Toyoma (2015) argues that *just* adding ICT to learning environments, such as the well-known 'Hole in the Wall' project (Mitra & Dangwal, 2010), One-laptop-per-child[28] and numerous other ICT4D (ICT for development) projects, often lead to disappointing results. Instead of bridging a gap, technologies rather reinforce an existing situation: underperforming students perform worse, while more talented or skilled students are better to cope with the possibilities that new technologies bring (Toyoma, 2015).

Experiences within the reAct project are in line with these criticisms, although when it started, the expectations were high. 'Web 2.0' tools would empower students and allow them to express themselves in creative and collaborative projects in an international context. In reality, without guidance or control, many students started gaming or chatting with friends and spent their time during ICT sessions relatively ineffective. As described, the potential of ICT was demonstrated, which provides the direction for a more deliberate, focused, and more effective introduction of ICT to support self-guidance, collaboration, exploring, creativity and pedagogical principles to engage at-risk youth.

One of the reasons for the fact that, in many pilots, students and teachers were confronted with a toolset, but without much guidance or specific support, was that the process of exploring and identifying relevant ICT tools, and putting those into practice, was an objective in itself. ICT was a main focus in many pilots, and participating in the project would 'force' teachers and students to learn to navigate the web and make their own choices regarding the relevance of tools.

Most teachers indicated to have improved their ICT skills, but on the other hand, the focus on 'using ICT' may have been at the cost of a focus on 'using ICT for specific educational or pedagogical goals'. A more deliberate and careful introduction of ICT would be suggested to overcome the obstacles and barriers described in this chapter, and to better facilitate the pedagogy.

[28] See http://one.laptop.org/ for information about the project

6.4 A Pedagogical Framework to Engage At-Risk Youth

The reAct approach analyzed in the previous sections was aimed to engage at-risk learners in different educational contexts and to connect to lifelong learning practices. Unemployed and unqualified youth and young migrants constitute a considerable social problem in Europe and the aim of reAct was to find ways to recover the intrinsic motivation to learn and thereby improve the opportunities for participation. Key in the approach was to use ICT as a means to give control of the learning process to the learner. We analyzed the impact of various pedagogical principles in the conditions determined by organizational choices and institutional factors to get to a comprehensive understanding of the potential, limitations, and barriers of implementing the reAct approach.

The eight principles of the framework outlined in this sections follow from this analysis, and provide the basis of a pedagogical approach that engages young learners to take control of their learning process. The core of the framework is constituted of the two interrelated principles, interest and relevance, as illustrated in Figure 40. Four 'supporting principles' have been included facilitate the design of effective learning activities and strategies. Finally, two principles are added that address preparing for, organizing, and assessing the approach. The meaning and purpose of each of the principles is explained in detail, and a list of guidelines is added to facilitate practical implementation. These guidelines are based on relevant successful strategies and interventions from one or more case studies.

6.4.1 Core Principles: Interest and Relevance

To engage at-risk youth, the learning experience should be use students' interests as a starting point, and focus on relevance. The basic premise of the framework is that it facilitates a process of making students' interests become relevant and meaningful.

Core Principle 1: Taking students' interests as a starting point

A distinctive characteristic of the reAct approach was that activities and experiences did not revolve around the curriculum, but were (initially) based on a student's interest. The most important reason to take students interests as a starting point was to disrupt passive learning behavior towards a self-sustained, pro-active and positive behavior. Providing students with opportunities to explore, reflect on, and share their values and interests proved to have the potential to significantly improve engagement, attitude, and drive self-guided exploration, leading to increased self-awareness and confidence.

In practice, the different levels of students' interest, skills and knowledge have to be acknowledged. Activities should help students with only shallow understanding and knowledge about a particular proposed topic to deepen their interests and develop personally relevant goals related with the interests.

To do that, we propose four complementary dimensions of interest: the personal, social, societal, and institutional or curricular dimension. The table below describes and defines the different human needs that underpin these dimensions.

Table 38 - Interest-dimensions

Interest > Me: *being*	This dimension represents the individual need to develop a personal identity that reflects his or her beliefs, personal values, and interests. It emphasizes the question 'Who am I?' and the process of self-discovery.
Interest > others: *belonging*	This dimension represents the individual need to belong to a certain group and the acknowledgement that a classroom is a highly social environment in individual behavior and engagement is strongly affected by implicit and explicit social cues and configurations. It emphasizes the student's question *'How do my peers see me?'* and stresses the importance of promoting and encouraging positive interactions.
Interest > Institute: *becoming*	This dimension is oriented towards the educational institute, addressing curriculum, activities, and content. Most students indicated an interest in the curriculum, and nearly all of them wanted a diploma that was formally recognized. Curriculum therefore represents the institutional context and educational program and its formal requirements and objectives, which addresses the student's professional or academic interest and the question *'Who do I want to become?'*.
Interest > Society: *changing*	This final dimension addresses the individual need to act and contribute to a higher goal. It relates with the interest in societal issues, such as inequality, expressed and experienced by many of the participants. It adds meaning to the learning environment and addresses the question *'What do I want to change?'*.

Asking students to share their interests had an additional, un-anticipated and very powerful benefit: knowing what drives your students enabled teachers to develop a more effective and more personalized teaching approach.

The following practical guidelines support the above principle:

- Design for different levels of interests: The strategy should be to offer minimally invasive guidance (Mitra & Dangwal, 2010) to those who have a clear goal and show understanding and deep interest in their proposed topic, and offer more time as well as structured guidance and feedback to those who unable to produce personal goals and who do not demonstrate deep and sustained interest in the topic they propose. Knowing what you like or find worthy to pursue can take considerable time and this 'discovery process' can be considered part of the learning process. Interventions may be useful when students are not demonstrating any interest or hardly make an effort to find something

worthwhile. Obviously, the time available depends on the practical conditions in which the pilot is executed.

- Flexibility: Being flexible to allow students to change course, when they are committed, either in terms of scheduling or prolonging activities or selecting content for class sessions.
- Structure: Provide a framework or template that helps students go from interest to project-proposal; these should include suggestions for finding and collecting relevant information, methods to visualize and present ideas, and a proposal format.
- Reflection: Reflect on projects and interests in class, and encourage sharing interests and updates online, preferably using tools known to them, e.g. Facebook.
- Interest-based suggestions: Providing personalized support based on insights into the interests and ambitions of students.
- Providing content: Develop and deepen students' interests and curiosity in professional and societal issues, e.g. by providing relevant links, showing inspirational videos, and inviting reputable experts.
- Higher goals and values: Prepare several interest-based projects that relate with social issues, such as inequality, health, or other topics that are likely to interest the students.
- Prepare interest-based projects that relate with the curriculum.
- Make connections between peers with similar interests, and help them develop a shared goal.

Core Principle 2: Focus on relevance

Student resistance, lack of commitment, and disengagement, was linked with a perceived low relevance. Students who thought that what they were doing was relevant, demonstrated more commitment, which reinforced their positive perception of relevance. This phenomenon is explained by expectancy-value theory, which describes intentions of learners as the product of i) their expectation to succeed in the task, and ii) the perceived value of the task and outcome of the task (Wigfield, 1994). We saw evidence of mostly the latter; a low perceived value of the task (outcome) reduced intention. The reason for not seeing evidence for 'expectation to succeed' relates with the fact that most of the more complex 'tasks' were ambiguous and vaguely described to students: it was their own responsibility to define the task, which made it so difficult. Without 'knowing' what tasks lay ahead, students could not expect to succeed or not.

A perceived lack of relevance was supposedly caused by a lack of time to reflect on, and improve the learning activities and outcomes. In addition, many teachers were unable to make explicit and support learning meta-cognitive skills, such as planning, coordinating tasks, decision-making, following and participating in discussions,

presenting oneself, and conceptualizing ideas and projects. How students and teachers viewed education, and whether they were traditionally oriented or not, also affected their ability to recognize and appreciate implicit learning processes.

There are many opportunities to increase the 'real' and perceived relevance of learning experiences, which are described as practical guidelines below. Essential to this is the development of strategies and activities that address *all four dimensions* of relevance and underlying values:

- Personal and intrinsic relevance: Facilitating students in a process of discovering their true interests, possibly through a process of personal guidance, creative expression, and reflection (see NL1 Case; chapter 4.7), and to design and propose learning activities and internships that relate with students' personal interests and deeper personal values. Templates may be provided that support students in a process of meaningful divergence (using the Internet) and convergence (formulating goals and making decisions).
- Social relevance: people add, and reinforce relevance, so it helps to involve friends, family, and other 'external' people from students' and teachers' social networks. The international context also increased students' perceived relevance, albeit temporarily. Teachers should focus on encouraging, supporting and coordinating positive interactions, on effective collaboration, and on shared interests.
- Professional and academic relevance: first and foremost, teachers must be able to identify and explain the value of implicit learning processes that are part of the process. In addition, it helps to integrate or relate activities with the formal program or curriculum, because of students' intrinsic interest in curriculum topics (*"I really like ceramics"*) as well as their extrinsic interest in the program (*"I just want a diploma"*). Carefully introducing extrinsic rewards and integrating formal and accredited assessment may increase student commitment and subsequently intrinsic motivation, but may also interfere with intrinsic motivation. In addition, many students were interested in local employment opportunities and local industries and schools, which suggests a need to extend the curriculum and to offer practical opportunities to learn and demonstrate professionally relevant skills. The school's manager, other teachers, and relevant experts also carry authority that can increase students' perceived relevance.
- Societal relevance: the popularity of social issues, such as inequality, health, and democracy, demonstrates the potential of activities that appeal to a higher cause or goal. In addition, the local history and culture often appealed to students, which also emphasizes the value of organizing activities that extend the learning environment beyond the classroom, such as activities relate with the local industry, history or culture, and regional festivals. Students should be encouraged to go out, and explore their surroundings, which should be understood as part of the learning environment.

On a more general level, teachers must offer a transparent and consistent approach, help students focus, and take time for reflection:

- Relate, connect and integrate: in order to create a consistent experience, make sure to connect students' interests, the learning activities, and assessment rubrics with relevant skills or personal learning objectives. Discuss and be transparent about the relation between student projects and relevant skills and knowledge.
- Restrictions and limitations: maintain focus by adding helpful restrictions and limiting options for students. The adage *'Everything is possible'* was often not conducive to productive behavior and thereby feeding into a perceived lack of relevance. Hence, helpful restrictions, guidelines, and reduction of options to students can be an effective strategy to deal with a lack of progress. ICT distractions should also be accounted for, in particular mindless and irrelevant activities on Facebook, YouTube, and other sites. The use of ICT should support their projects, and students should be able to be explicit about their strategy for using the Internet.
- School distractions refer to the distractions of other students, classes, courses, and examinations that can reduce the focus of the target group. Social comparison was a real issue in some pilots, in particular the comparison with other students in the same institute.
- Continuity: the time-schedule is an essential ingredient to increase focus. Sessions should be at least two consecutive hours, and minimal five hours per week, in order to give students the opportunity to get into a *state of flow* (Csikszentmihalyi, 2008).
- Milestones and deadlines: because they work and encourage students to finish their projects or demonstrate intermediate results. A focus on 'presenting' also helps them to conceptualize and reflect on their activities.
- Present and reflect: Let students demonstrate their ideas, skills, progress and coordinate group reflection activities.

The visualization below represents the core of our framework to support interest-based meaningful learning processes. The center shows the "Learner" to stress the student-centeredness of the approach. The Learner is, most likely, diversely motivated, and should be allowed to discover an interest that matters to them and which is perceived to be representative of their identity or "Self". Such interest in Self may well be related or overlap with any of the other dimensions, and teachers should be aware, and develop strategies that address all these dimensions. For example, a student from Romania expressed an interest in stray dogs, possibly because she was an orphan herself. The student could then, with a teacher, look this interest from the perspective of "Others", "Society", and "Institute":

i. To add societal relevance, the student could investigate local or regional opportunities to turn the interest into action, for example by volunteering in a foster home or shelter for stray dogs. She could also decide to explore the

topic online and prepare a presentation for her peers and teachers to create awareness about the topic that matters to her.

ii. The social relevance is focused on the classroom dynamics, rather than the wider societal context. Teachers could find other students to help her with the project, and create an atmosphere where the student feels free and encouraged to talk about her topic. Similar experiences by other students could also facilitate a 'social significance' of the topic.

iii. With regard to the formal learning component, teachers may be able to connect her proposed topic *or* the learning activity to an existing course or subject. The topic of stray dogs could, for example, be related with dog psychology, learning, and animal behavior, while, assuming she prepares a presentation and explores the topic, support could be offered for skills related with communicating, presenting, and (online) research.

Importantly, as suggested earlier in section 6.3.2, it is suggested to explore the profoundness of the interest expressed by the student, whether it is merely affective and representative of the student's interest at that particular moment (*'I like X'*), or whether it represents a long-term passion or interest and also carries cognitive weight (*'I like X and I know about it'*). If the interest appears to be shallow, it can be risky to invest substantial amounts of energy in creating engaging and relevant activities and making relevant connections, because the student may not be that interested after all. A wiser strategy would be to facilitate further divergence and exploration first, give students time and some structure to deepen the interest, but still providing the option to change topics. The energy needed to sustain self-guided activities requires a passionate interest in a topic, so it is suggested to facilitate careful and deliberate exploration of different topics before setting specific goals.

The above process is captured in Figure 40, which visualizes our proposed pedagogical framework for at-risk learners.

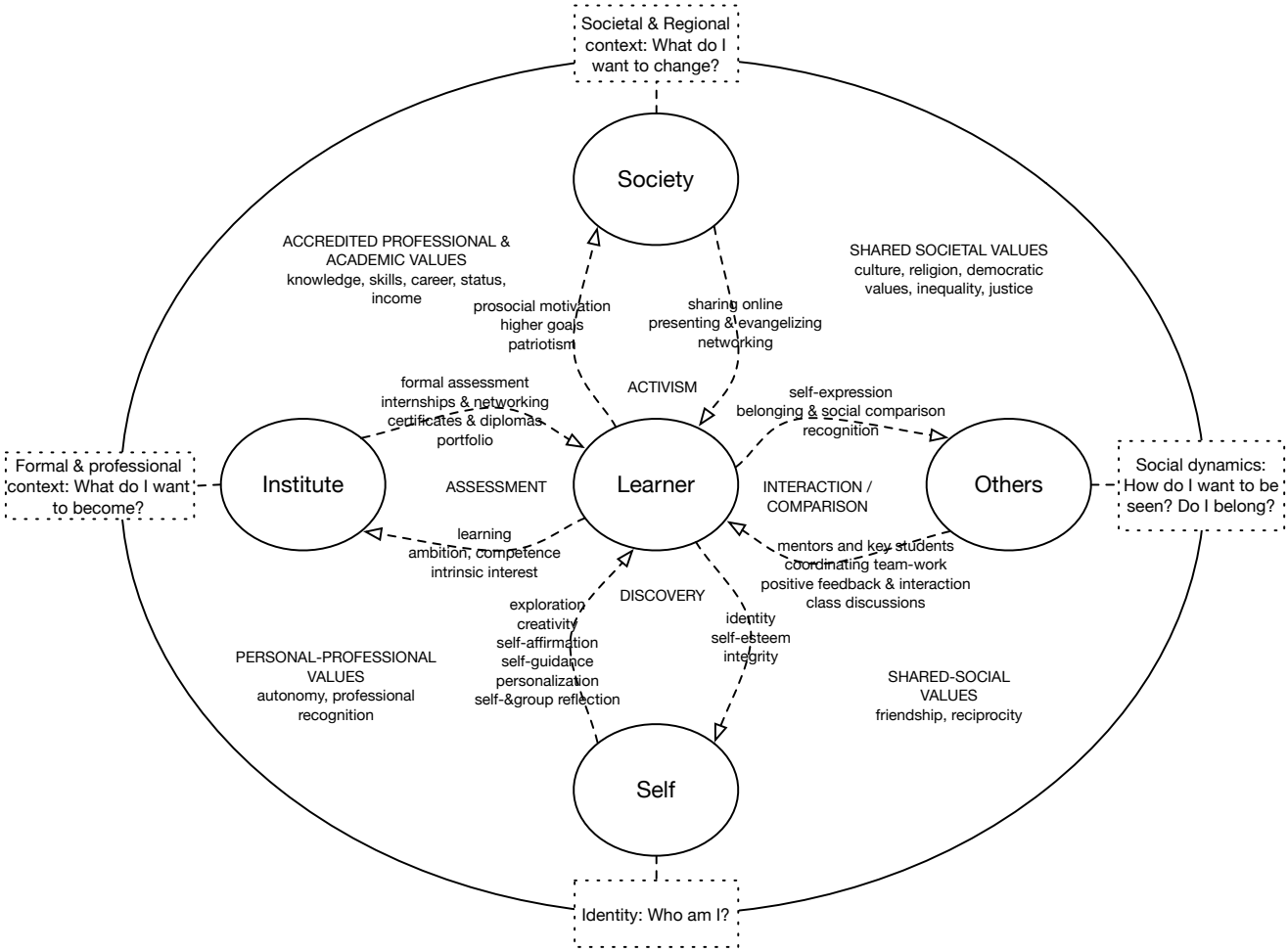

Figure 40 - Pedagogical Framework for At-Risk Learners

The above depiction of the framework integrates the remaining principles explained in the following sections, which should be seen as *supporting principles*. Supporting principles are not confined to any of the four dimensions that constitute the above framework, but aim to facilitate teachers in a pedagogical process of co-constructing relevant learning experiences with students based on their interests.

6.4.2 Supporting Principles: Creativity, Self-guidance, Interaction and Collaboration

The reAct approach, and in particular the interest-based component, was challenging to put into practice. In a cohort of twenty students, it is likely that fifteen different interests or topics will be proposed. This requires a completely different approach as compared to the regular situation, when teachers and students focus on one single topic. Few students possessed the skills to elaborate on their interests in a meaningful and effective way, failed to progress, ultimately leading to frustration and their disengagement. The experiences with reAct have resulted in the following principles to support the above framework.

Principle 3: Creativity for learning, self-discovery, and engagement

Creativity, or, letting students create artifacts in a free and autonomous way, and providing the tools to do that, has several (potential) benefits:

First of all, the creative process itself may address certain relevant creative skills, such as preparing a presentation, video-editing or ceramics skills. Secondly, creativity was used as a method to help students discover and deepen their interests through collaborative reflection of the choices represented by the created artifact. Finally, creativity was considered a fun process that encouraged students to take control and feel ownership. It rewarded students, because the creative process often had a direct 'return on investment', meaning that efforts were directly translated into something that could be seen, touched, and, essentially, shared.

The following practical guidelines support the above principle:

- Creative skills: providing clear guidelines and support that help a student improve his/her proficiency in using a particular creative tool or professing a particular craft. Identify all relevant processes and skills involved in the creative process.
- Minimize barriers for creativity: ICT tools can require sign-up, may be slow in use, unclear, in another language, or not fit for purpose. The creative process improves when students are not confronted too often with limitations of the tools they use to express their interests. Careful choice of ICT tools is essential, and only if necessary and supports a particular need or task (e.g. *'Build a website'*). Sometimes paper, pen, scissors, glue and some magazines are all what you need to induce a creative process.
- Progress and reflection: letting students choose a particular tool or task (e.g., *'Make a 10-picture photo-documentary about your life using your phone-camera', 'Draw your future self using paper and pencil', 'Make a collage with images and texts using your favorite magazines'*) to express their interest. Ensure that students are creating something, that they are in dialogue with their artifact, and help them reflect on their creation to identify specific topics that can be used for their project.
- Ownership: creativity relates with ownership, and it's therefore important to recognize personal contributions in group processes and collaborative tools (such as wikis). It also helps teachers to support and facilitate the process.
- Sharing and reflecting: to address the need to share and interact with others, teachers should offer tools and opportunities for sharing with peers and facilitating constructive reflection by peers.

Principle 4: Building towards self-guidance and ownership

At the start of each pilot, students were excited about the opportunity to start their own projects, and, after delivering their final presentation, were very proud and confident. The intermediate process, however, was considered very difficult, and

few students progressed well without guidance. Highly unstructured projects as well as highly structured activities and assignments resulted in lower engagement, while pilots with a balanced approach between supervision and student autonomy were more effective in engaging students. Giving ownership can empower students, but may only happen when students feel self-confident and in control. Giving control is not the same as feeling in control, which should be the criteria for effective pedagogy.

The following practical guidelines can be used to support students build confidence and skills to manage their learning process:

- Build scaffolds into the learning and project-based approach, which can be introduced to students who are struggling to find a focus and to progress. These scaffolds address inquiry, ideation, collaboration, project-management, decision-making and other processes and help students progress from 'vague idea' to feasible project proposal, execution, and finally presenting the project.
- These scaffolds should be based on each individual student's knowledge-, interest-, skill level, and commitment. Different 'tracks' may be designed for different students, ranging from highly structured to highly autonomous.
- Introduce milestones and deadlines to help student plan their projects, and reminding students about those.

Principle 5: Promoting and coordinating positive interactions

The diversity of projects implied that teachers could not give expert guidance to all students, which required them to focus on facilitating the process. Differentiation is more challenging in cohorts with more than 10-15 students, and teachers explored, often unsuccessfully, the opportunity of peer-support and peer-guidance. Many teachers (and students as well) missed the skills to effectively facilitate and support (and participate in) peer-based and collaborative learning processes, contributing to frustration and disengagement. These skills would include collaborative decision-making, conflict resolution, planning and task division.

Students were very sensitive to their social surroundings, in a positive as well as a negative way. A lack of response on a contribution shared through Facebook could reinforce a student's belief that he/she was not interesting or good enough. On the other hand, positive social interaction, online and in class, significantly contributed to student engagement. Progress was generally better when students worked with at least one other person, because students motivated each other, were having more fun and were able to divide the tasks among them. A positive atmosphere in class is a precondition for collaboration to emerge, as we've seen in multiple cases (GR, NL1). When the conditions are right, students can be empowered to even self-organize the class, as we have seen in NL1 and SP2.

The following practical guidelines support the above principle:

- Leadership and mentoring: identify influential students and ensure their (positive) participation, for example by giving them additional tasks or having them 'lead by example'. Experienced students could take a role as mentors, for example students who were part of a previous pilot.
- Co-location and opportunities for informal collaboration: it helps when students are in the same room, and if there is time and opportunity for informal collaboration.
- Balance competitive elements with collaborative ones: introducing an implicit competitive element can be helpful to spur students' participation, but it should only be introduced if it does not diminish collaboration.
- Creating interdependencies: one way to 'enforce' collaboration is to introduce or promote projects that depend on, or relate with each other (e.g. combining projects of a student interested in drawing, and another student interested in writing a story).
- Collaborative reflection and peer-support: challenge students to present their project in front of their peers, and coordinate constructive and collaborative feedback. Also prepare students for perceived negative or no feedback.
- Coordination: teachers have an important role to play in managing progress within groups, especially if students are not co-located. An effective way is to have teachers assign themselves to specific groups, so not all teachers are responsible for all groups.
- Problem-based collaboration: introduce or simulate a real problem that cannot be solved by the teacher, such as an ICT problem or organizing an event, which requires students to collaboratively come up with solutions.
- Sharing: offer opportunities to share their work and updates online and offline in the meantime.
- International collaboration (if applicable): must be well prepared and coordinated by teachers, with strict milestones, objectives, rules for team formation, clearly defined project outcomes and division of tasks, and clear communication protocols for both teachers and students involved to overcome a potential language barrier.
- Social comparison: let students reflect and focus on the relevance of the activities, in order to come up with a shared understanding of relevance, to avoid negative peer-influence.

Principle 6: Using ICT wisely

In different pilots, teachers used ICT in different ways, and with different effects. The most important notion is that unskilled teachers and underperforming students are unlikely to fully use the potential benefits of ICT in a self-guided and self-organized manner. ICTs do not offer relevance or sustain engagement by and in itself; at most, they can support various processes that address engagement or increase relevance. The effect of an ICT-rich approach depends largely on the ability

of students to use the tools effectively, which requires such skills as information literacy, goal-setting, decision-making, project management, planning, search and research, creativity, ideation and brainstorming, collaboration, communication.

Most students were unskilled, and were able to perform only basic tasks, in class and online. The initial positive effect quickly dissipated and without much support, gave way for distraction and frustration. ICT should thus be introduced and used wisely, which means that teachers first start with understanding and preparing the pedagogical approach, and only then start to consider and assess tools to support the approach. The assessment of tools can be a collaborative process of students and teachers, because it allows students *with* knowledge of specific tools to contribute their ideas and understanding of the tools. Tools can be described in terms of tool language, ease-of-use, and functionality.

The strategy should also address likely barriers and obstacles, most importantly the distraction and the lack of relevant skills. Teachers can recommend students to use tools like SelfControl (Mac, Linux) or SelfRestraint (Windows) that help students blacklist or whitelist specific (distracting) websites for a specified time. It should be easy for students to enter the process (i.e. chatting online, collecting inspiring videos and pictures, writing short texts), but teachers should then gradually challenge students and encourage students towards more complex processes, learn relevant professional tools and engage in processes that help them developing relevant skills and explore their topic in more profound ways. Rather than knowing how to use every tool, teachers have to understand the pedagogical approach and the processes that support it. This empowers teachers to help students understand the use of a particular tool, without knowing the details of the tool, and maintains the onus of exploring and assessing a tool for a particular task with the student. The ICT strategy teachers adopt should not be focused on learning a particular tool, like Microsoft Excel; rather, it should be about learning to create a realistic planning and strategies to keep the planning, which could be facilitated by a tool like Excel (or just pen and paper).

The following practical guidelines support the above principle:

- Determine pedagogy and objectives, then evaluate tools, and develop an ICT strategy (see above);
- Toolset: After deciding about the pedagogical focus and objectives, establish a limited toolset of about 10-20 tools that cover a broad range of functionalities that make working on projects more collaborative / efficient / engaging / inspiring / fun / meaningful / transparent / ___*fill objective here*. Elaborate, evaluate and describe the tools in detail, with students. Consider desktop software and non-digital tools, especially when bandwidth is limited or if the ICT is unreliable or of low quality.

- Roles and responsibilities: often, students are more experienced in contemporary software and tools, which is an opportunity to empower students and allow them to become the teacher, and teachers to adopt the role of student.
- Sharing interests: one of the clear benefits of the approach was that it encouraged students to share interests on Facebook, visible to teachers, who could then start building a more personal relationship with students and offer personalized suggestions. In addition, students really liked to interact online and share videos and texts they identified with.
- Personalized tools: a personal device is preferred over public computers, which often do not allow students to save things or to personalize the environment. Mobile devices offer additional opportunities; many students used it to capture pictures, record interviews, or make videos at home or when they were on the street. They are instrumental to extending the classroom experience and integrating 'real life' experiences.
- Continuity: because of the startup time and time needed to get into a flow of working, one-hour sessions are likely to be less efficient than longer sessions, unless the startup time is reduced to 10 minutes.
- Preparing sessions: in Spain and Greece, connectivity was a scarce resource, which forced the participants to prepare their time online very well, increasing their focus during sessions.
- Making contributions visible: students were very sensitive to (positive and negative) feedback, and a lack of feedback was often detrimental to students' participation. It can be questioned whether the expectation of "Likes" or comments should be encouraged, or that teachers should try make students less dependent on such feedback (Gangadharbatla, 2008; Valkenburg, Peter, & Schouten, 2006). By making team efforts and individual contributions visible, students were able to learn from each other (learning). In addition, it encouraged participation to those students who had not yet contributed (peer-pressure) and the mere fact that work would be published motivated students to make an extra effort (recognition).

6.4.3 Organizational Principles: Focus, Support, and Evaluation

The nature and impact of a pedagogical approach depends on conditions in the educational setting and the stakeholders involved. In this section, we propose design principles that address contextual and organizational factors that influence the pedagogical approach, and emphasize the importance of evaluation during all stages of development and implementation.

Principle 7: Convergence through co-creation

The success and effects on engagement in different pilots depended on the commitment and responsibility of teachers and on the level of management support. The high level of teacher's commitment in several pilots (GR, SP, PO) can be

explained by the fact that their own objectives as well as the institutional goals and interests were reflected in the eventual pedagogical approach and activities. Moreover, there was strong support and staff development to ensure the understanding of the pedagogical principles, and extra time for teachers to prepare relevant activities.

One of the primary goals of the research was to develop a context-sensitive and flexible design framework to ensure its usability in in different educational contexts. Rather than specifying a detailed step-by-step method, it allows for flexible application of the principles to fit the local context and objectives. The illustration below represents this process of convergence that bring together the pedagogical principles, stakeholders, and institutions into a set of coherent and complementary goals, a course plan, and a required support structure.

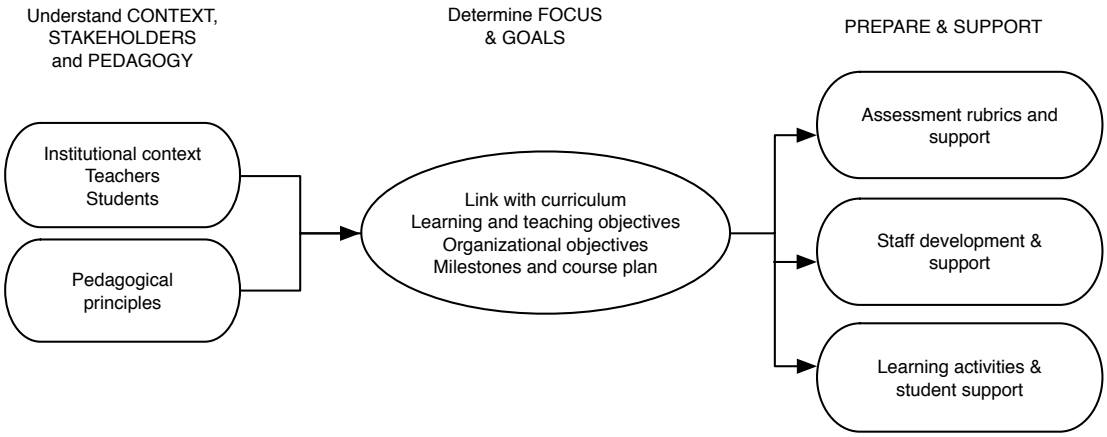

Figure 41 - Context Framework

Clearly, the volume and direction of staff development and student support depends on skills, goals, and attitudes of teachers and students, and on the institutional conditions, including availability of resources, scheduling flexibility, formal regulations and objectives.

The process of convergence should be addressed from two perspectives: *alignment* and *change*. *Alignment* refers to, on the one hand, the 'readiness' of the participants (skills, attitudes), in particular the teachers, and on the other hand, the opportunities available to support and implement the pedagogy. In other words, it addresses how well the stakeholders (skills, mindset) and conditions (regulations, resources) are in line with the thinking and ideas that underpin the reAct framework. High alignment, for example, would be when teachers and students have relevant pedagogical experience (pedagogy), and the regulatory conditions are supportive of the pedagogical approach (opportunities). *Change* means that the teachers and manager(s) involved have the power and knowledge to change the conditions in which the pilot is executed, and that the initiator is part of the organization of the pilot.

An important implication of the above is that when, in a certain context, alignment is limited, and there are no resources or opportunities to change the conditions and to prepare teachers, effects will also likely be limited. However, as can be read in the analysis of the context, section 6.1, apparent limitations (such as limited organizational resources) could in fact be opportunities to involve students. Another important lesson from the more successful pilots was that most of this happened in a highly collaborative fashion: management, teachers, and even students contributed to the process of convergence of the pedagogy with various institutional, personal, and learning goals and the institutional possibilities and resources.

Principle 8: Measure and improve

Obstacles, frustration, and unexpected events and outcomes constitute one of the few certainties when introducing an innovative approach. The driver behind the introduction of an innovative approach, such as reAct, is to learn and improve. One apparent limitation was the lack of time to reflect on the approach; another was the lack of a comprehensive framework to evaluate and improve local approaches, and better comprehend own actions and outcomes.

A research-based approach is therefore proposed. Design-based research, as extensively described in chapter 2, is a methodology in educational research, which involves teachers and instructional designers in the research process, and where findings are transferred to guidelines and suggestions to benefit (local) educational practice (Wang & Hannafin, 2005). The objective is that research and evaluation contributes to improvements in instructional design, teaching, and more effective interventions. It is therefore very appropriate in the context of innovating education.

Collecting data about what is being done, when interventions have been introduced, and how they affect engagement, appreciation, interaction level, confidence, and other factors, would make it possible to improve the approach. In addition, it would support teachers to monitor and support students more effectively, and empower students with information that helps them improve specific skills and knowledge. Finally, a kind of 'return on investment' can be determined for an entire pilot or for individual components of the pilot, which may be used for the allocation of resources and organizational support.

Evaluation should be at the core of the process, and involve teachers as well as management, in order to increase the likelihood that an improved pedagogical approach receives the appropriate support and recognition. A three-stage evaluation model, the input-process-output (IPO) model, has been developed based on our own

experiences and feedback from partners to overcome obstacles and to facilitate improving the organization and the pedagogical approach in new iterations. Although we were not aware of the existence of an approach with the same name, it is conceptually similar to other IPO-models[29], used to evaluate training effects, collaboration in teams and group dynamics in problem-solving processes, online communication, and as an approach in systems analysis and software engineering for describing the structure of an information processing program or other process. Our proposed evaluation approach is process-oriented, which characterizes design-based research (van den Akker et al., 2006), and identifies three levels or stakeholders involved in the process: management, teachers, and students. Each of these three levels represents a set of values, characteristics, and objectives that influence the design of the pedagogical approach and its effects as well as the perception of these effects. The model, shown in Figure 42 and explained in the following paragraphs, also implies actions that need to be taken on each level.

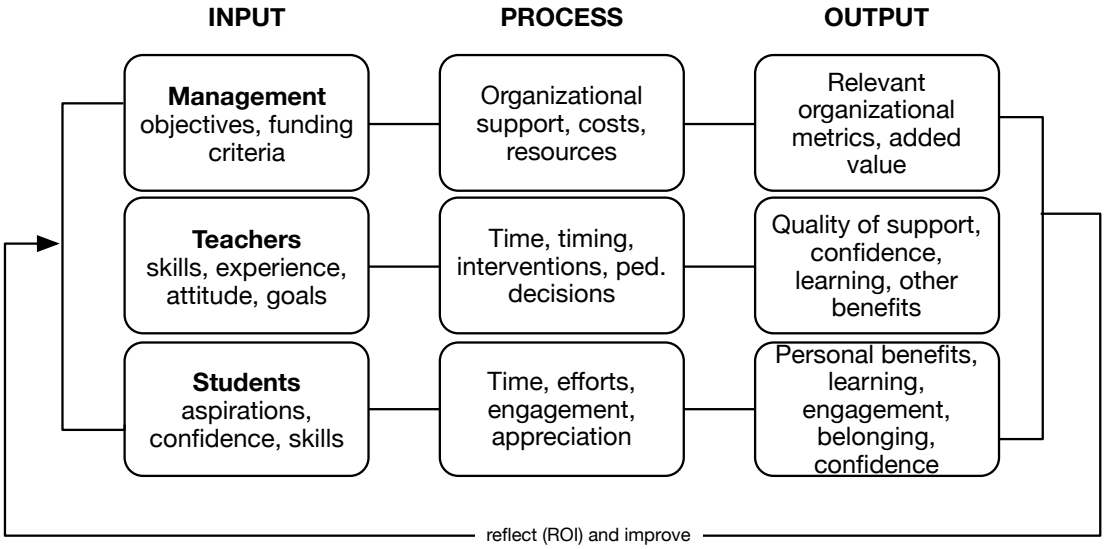

Figure 42 - Evaluation: Input-Process-Output Model

The 'input' relates to the conditions and contributions for all three stakeholders and can act as a 'diagnostic template':

- Management level: creating an 'organizational profile' that describes the main objectives and organizational metrics, such as the dropout rate, grades and other

[29] A simple Google (Scholar) search provides an overview of the variety of application contexts of IPO models.

performance metrics, and which defines the specific organizational objectives for the course.

- Teachers: creating a teacher profile that describes the present teaching skills, experiences, and confidence level (with regard to relevant teaching skills), job satisfaction, interaction with colleagues, professional objectives, and possibly an estimation of the teaching performance (grades, course satisfaction level, dropout rate).
- Students: creating a student profile, per student, which indicates his/her attitude towards learning or education in general, appreciation, confidence and engagement level, personal aspirations and learning objectives and expectations for the course, skill level and present academic performance.

The 'process' aims to capture and measure efforts, investment, experiences, and interventions of the new course.

- Management level: the organizational support and investment to run the course, such as teacher training, remuneration and support and additional resources and costs.
- Teachers: both the investment, and the interventions should be comprehensively captured. This includes the real time investment of teachers (including training), scheduled time (in hours per week) and timing (continuous or intermittent), a timed description of interventions, activities, and events, the pedagogical focus, and (online/offline) personal interactions with students. Includes (collaborative) reflections on the approach.
- Students: measure per student the engagement level per activity student, time investment (also at home), relevant perceptions (on relevance, confidence level, appreciation, etc.), and assess the learning. Includes collaborative reflections on the student work.

The 'outcomes' refer to the return on investment in terms of engagement, skills, and presence. Evaluation should not be confined to metrics, but include a thorough reflection from all participants on the implementation. Combining the resulting data will provide a comprehensive picture that supports improvements on different levels.

- Management: focused on how the implementation has affected aspects that are relevant for the organization, such as dropout rates, student appreciation, job satisfaction, and other aspects, including implicit ones, to establish a comprehensive 'return on investment'.
- Teachers: focused on aspects that relate with teaching quality, including the quality and appropriateness of teacher training, effects of interventions, personal achievements, job satisfaction, collegiality, professional development, lessons learned, and class behavior and appreciation for the approach. It also reflects on

student experiences concerning the role of the teacher, for example the level of support and the type of support.

- Students: focused on the personal benefits for students, such as engagement, attitude, ambitions, sense of belonging, ability to meet personal goals and aspirations, achievements and lessons learned. It also addresses students' interaction with peers, their use of technology, and other aspects that they considered relevant to their learning experience.

It should be stressed that such evaluations should be executed using mixed methods. Often, either quantitative or qualitative approaches represent matters such as engagement or student performance only partially at best, while combining different sources of information gives a richer and more accurate picture of the situation.

This chapter answered the main research question "How to engage at-risk learners?" by looking at the effects of the reAct approach in different cases. The resulting framework consists of two core elements, interest and relevance, four supporting principles, and two organizational principles. The framework aims to support educators in the creation of relevant educational experiences for at-risk learners in different educational contexts. The limitations of the framework, as well as potential for further research, are discussed in the following chapter.

7 Discussion

Situated within a multilateral project under *'Key Action 3: Information and communication technology'* of the Life Long learning program of the European Union (reAct, 2010), the purpose of the study was to develop and evaluate an effective and scalable approach to address at-risk learners in different educational contexts, with a particular interest in the use of ICT to facilitate the approach. The research demonstrates that the effects of 'the reAct approach' (characterized by self-guided, interest-based projects and collaborative learning) result from a complex interplay of factors, including institutional autonomy and culture; participant background, skills and mindsets; organizational support for teachers and integration of sessions into the curriculum; significant student support for complex tasks such as collaboration, decision-making, goal-setting, and project-management; consistent feedback on tasks and processes to increase perceived relevance; and time, responsibilities and opportunities to explore personally relevant topics.

The comprehensive nature of the research makes it difficult to present specific theoretical contributions. Rather, this design-based research should be valued from a perspective of comprehensive or holistic design of educational programs addressing at-risk learners. Rather than narrowing down to a single unit of analysis, we have tried to capture the most important systemic elements and factors that, in practice, cannot be avoided and therefore have to be anticipated. As suggested by Day and others (2013), based on their comprehensive study of second-chance educational programs across ten European countries, it is *"the cumulative effect of the different features of second chance [programs] that makes them effective"* (2013, p. 91). They underline the importance of building schemes that are multi-faceted and responsive to individual learners' needs.

In addition to the elaborate description of the characteristics of the complex 'micro-system' that make up an engaging learning environment, our analysis resulted in

several interesting, more specific outcomes, worthy to be discussed here in the context of existing literature. Being one of the most relevant sources for our research, because of its European context, the holistic approach, and of course the target group and programs investigated, we use Day et al. (2013) frequently in our discussion.

After the discussion of results, we describe policy implications (with particular respect to the European Commission), future research opportunities, and limitations of the study. The chapter concludes with a personal note.

7.1 Interpretation of the Results

Taking ownership and fostering self-guidance was an essential element in the reAct approach, aimed to facilitate a sense of empowerment and control over learning, which, as suggested by Day et al. (2013), is an essential characteristic of successful measures to target at-risk learners and compensate for a 'loss of motivation, feeling of inadequacy, failure, and self-esteem'. The various case studies offer a rich account of what it means to take ownership. Clearly, from our analyses, the notion of 'ownership' emerges as a multi-faceted and complicated issue. A feeling of ownership and control only happens when students possess the skills to move forward; in other words, when they feel in control. Many students get 'stuck' in an exercise of exploring and without meaningful support students run the risk of getting stuck in an endless exercise of exploring a topic. Control is as much i) giving choice or opportunity as much as ii) being able to utilize choices and opportunities (much in line with self-determination theory; see R. M. Ryan & Deci, 2000b). When skills or support are absent, the provision of choice or opportunities for ownership is likely to amplify disengagement rather than reduce or prevent it. Reducing options and offering scaffolds are useful strategies to facilitate a sense of ownership among students who feel threatened by the responsibility to make their own choices. Support may be necessary for the development of skills, such as research and inquiry skills, information literacy, collaboration and project-management skills. Creativity, or the act of creating artifacts, may also significantly help students in developing a sense of ownership, not merely *ownership of the artifact* being created, but *ownership of ideas* that reflect identity or personal preference or skill, which can be uncovered through a creative/reflective process of analyzing creative choices. Even extrinsic incentives, such as deadlines, have been used to engage students, leading to increased intrinsic motivation. On the other hand, cases such as AU (Austria) demonstrated that too much control is likely to result in passive behavior and less intrinsic motivation.

Teaching, in this context, is a balancing act of more or less autonomy, of fostering intrinsic motivation or introducing extrinsic motivation, of meeting external demands and answering to students' needs. Even within a largely homogeneous learning environment, different students will require different levels of support and

structure. Such highly diversified and personalized approaches are complex and demanding for teachers, and require insight into progress and participation of each individual student as well as understanding of their interests, skills, needs, and ambitions.

Starting from students' interests was considered, initially, as a relatively straightforward way to engage students. Based on motivation theories (see chapter 3.3), and in particular self-affirmation theory (G. L. Cohen & Sherman, 2014), our expectation was that allowing students to pursue a topic or activity of personal interest would reduce their defensiveness against learning and foster intrinsic motivation. Practice, as ever, was less straightforward. One of the challenges of an interest-based approach is the initial process of *finding a meaningful interest*. Teachers should beware of allowing students to pursue interests that, in the end, are not considered interesting after all. A second, related challenge was to *maintain interest* in the chosen topic. Interest diminished because the value (or *relevance*) of continuing exploring the interest was not clear to students, much in line with expectancy-value theory (Wigfield, 1994). In our analysis, we connected the notion of interest with relevance, as being two conceptually similar principles, and thereby made explicit four dimensions of interest/relevance that may constitute a helpful contribution towards the development of an adequate theory of interest-based learning. These dimensions address the affective, social and personal components of interest as well as the cognitive, societal and altruistic components. The two interrelated principles interest and relevance constitute the core of our pedagogical design framework to support teachers in evaluating and deepening students' interests and in developing interest-based strategies and learning activities.

In a review of recent 'interest research', Renninger and Hidi (2011) emphasized the importance of 'novelty, challenge, and the role of others' as important features of tasks and activities that generate interest. Although our findings are generally compatible with this review of literature, our research offers a slightly different perspective on the pedagogical construct of 'interest': rather than tasks and activities (process), our analysis resulted in a general typology of different interest categories (content). In addition, whereas most literature on interest assumes the perspective of a teacher responsible to 'create interesting content and tasks', our research takes a distinctive approach by taking students' interests as starting point for the teaching process. Furthermore, by connecting interests, relevance and *values*, our proposed pedagogical design framework can be easily embedded within values-based education, which, in agreement with Biesta (2010), we believe to be an appropriate educational concept in the context of building a strong, resilient, diverse and equal society.

There was ample evidence that substantiates the notion of 'novelty' as a means to engage and generate interest. However, we also saw that whereas traditional educational methods and institutions can lean on a kind of established appreciation

or perceived relevance, more novel educational forms and methods have to prove themselves, and prove its value, whether it's a new school (NL1) or a new approach within an existing, traditional setting (other cases). It is, therefore, essential to make clear to all participants what is the relevance of participation, and how it will improve their lives, and be specific about it. Without an expectation of value, undetermined students will, rather than confront the challenge of determining one's own learning path, try to avoid it by unwittingly building a defensive bias that favors traditional educational methods. This seems, to some extent, to be at odds with the claim made by Day et al. (2013, p. 3), who argued that *"second chance schemes have typically achieved the most success where they emphasize their distinctiveness from mainstream schools"*. In various cases, we witnessed how, for several reasons, students demanded to return to the regular curriculum, most importantly the perceived relevance of the formal curriculum over the novel reAct approach.

Facilitating students who are allowed or encouraged to choose a personally relevant topic is challenging from a *process* as well as *content* point of view. Concerning the former (process); when left to themselves, few low-educated learners will be able to engage in exploratory, inquiry-based learning, collaboration and interaction with peers, effectively assess and categorize new information, reflect on the learning process, and develop a deep understanding of the topic and the learning process. Teachers need to be able to convey the value of these learning processes as well as to facilitate students to engage with these processes. Current frameworks for 21st century skills and competencies offer helpful guidance to develop a quality assessment framework fit for a local context; Voogt and Roblin (2010) offer a useful review of five dominant frameworks.

With regard to the latter (content), teaching in a 'reAct context' is challenging because teachers, almost by definition, are able to provide expert knowledge only in one or a few domains, whereas students' in a reAct context proposed topics are likely to cover a wide range of themes. In a few cases (including IT, SP1), we saw that this challenge led to reduced participation of teachers. In the other cases, we identified several more and less successful strategies to deal with this challenge. The most dominant strategy was to reduce options for students (tools, topics, tasks) and offer support for this more limited set of options. Other strategies included (international) peer-based support, offering more time and flexibility, and inviting external professional to act as (content) expert and interact with students. Despite this diversity of strategies, none was really effective in offering substantial process and content support. While we argue that teachers should be largely responsible for the process support, content support (expertise) could more appropriately be sourced in a networked fashion. The concept of 'ad-hoc transient groups' may be relevant as a theoretical concept that describes how learners are brought together for a specific, learning-related goal ('ad-hoc') and for only a limited amount of time

('transience') (Fetter, Berlanga, & Sloep, 2010). To facilitate such ad-hoc, transient communities, for some time in 2013 I pursued the idea of developing a web-based environment to empower teachers to facilitate the kind interest-based, project-oriented, and student-led collaborative learning processes suggested by the reAct principles. Appendix XIII includes a market analysis and a mockup of an imagined 'reAct tool' (online environment) that could facilitate the approach.

A related domain of inquiry in our research that led to interesting outcomes was ICT-use. Contrary to what we expected, but in line with more recent literature on the use of ICT in education (i.e. OECD, 2015; Toyoma, 2015), we saw that the introduction of tools, without a clear strategy or support, often resulted in further amplification of existing dynamics; easily distracted students were mostly distracted and unable to keep their focused when browsing the Internet, while dedicated and resourceful students with support from parents found inventive ways to use ICT to their advantage.

Secondly, we found different 'difficulty levels' of activities supported by ICT, which we illustrated using 'flow theory' (Csikszentmihalyi, 2008). Extending this theory to the use of ICT in the classroom, combined with our findings that specify the activities and tools in relation to the difficulty level, can be beneficial, as it provides teachers with an easily understandable model to provide scaffolds, support and increasingly challenging tasks to students.

A final interesting finding concerned with the use of ICT relates with the use of Facebook during the project. As we have seen, the introduction of Facebook was met with resistance as well as enthusiasm, and increased distraction as well as engagement. Most students, in particular the younger aged students, were very eager to share their ideas and interests online, and interested in interacting with other participants. A downside was that a perceived lack of interest from these other students (i.e. 'Likes') could have a significant detrimental effect on individual students' motivation and interest. These findings are broadly in line with recent literature on the effect of Facebook on self-esteem, motivation and other psychological characteristics (Gangadharbatla, 2008; Gonzales & Hancock, 2011; Mazer, 2007). An interesting finding related with the use of Facebook was that the process of 'interest-sharing' was not just an engaging activity for students, but on the longer run allowed teachers to approach students in a more personalized manner, thereby forming an important foundation for improved relationships between teachers and students.

Apart from these more specific results, the holistic quality of the research should be addressed. An interesting framework was proposed by Day at al. (2013), based on their analysis of second-chance programs across ten European countries. They proposed an initial framework that integrates the characteristics of effective second-

chance educational programs. Table 39 reflects on the various themes that constitute the proposed framework by including our findings (in *italic)*.

Table 39 - Characteristics and indicators of second chance programs vs reAct findings (Day et al., 2013, pp. 92–93)

Themes	Characteristics & indicators
1. Governance and external partnerships	A cluster of good practices / key indicators relating to schools' governance structures and external partnership arrangements: 1.1 strong models of school confederacy and collaboration, including pooled resources, expertise, training and ESL data between schools; 1.2 multi-professional involvement in school governance structures, including representation from community organizations, employers and health / family support services; 1.3 learner participation in school governance structures.
ReAct was, deliberately, much more small-scale and not specifically aimed at second-chance collaborations between institutes. However, we did find evidence and best practices of learner involvement in school governance structures (NL1, SP2). In addition, the value of involving external stakeholders was clearly shown as well (GR, NL1, NL2, SP2).	
2. Institutional climate	A cluster of good practices / key indicators relating to the wider school climate, and particularly the spaces for children's participation in decision-making within this: 2.1 opportunities for socialization between staff and learners, such as shared mealtimes, communal spaces and summer school or residential schemes; 2.2 alternative disciplinary policies to prevent the unnecessary use of exclusions; 2.3 learner participation in the development of school policies, such as codes of behavior, to be drawn up as a contract with adults; 2.4 learners exercising choice over programs of study and non-curricular activities such as summer school programs and residential trips.
ReAct findings are in agreement with the proposed suggestion; however, we cannot comment on 2.2 as no instances of alternative disciplinary policies were reported. NL1 describes a few challenges related with involvement of students in school policy making. As a general rule, we would propose that the value of such involvement should be clear to students. IT and AU describe an institutional climate that prevented such involvement. Socialization, as we've seen, was well supported by means of Facebook and the initial 'interest-sharing' activity.	
3. Social and emotional wellbeing	A cluster of good practices / key indicators relating to learners' self-esteem and mental health. These include: 3.1 widened access to personal coaching or key worker arrangements, with greater personalization and choice in relation to pastoral support; 3.2 continuity in support provided within and outside of school, so that learners' wider social and emotional needs are taken into account; 3.3 inclusive policies towards bullying, including open discussion between learners and staff, and strategies for learners to deal with bullying issues

Themes	Characteristics & indicators
	where they arise; 3.4 rebalancing academic and pastoral aspects of the curriculum, with greater prominence for citizenship, personal and social education; 3.5 public celebrations of success; awards ceremonies and events.
There was limited specific attention to social and emotional well-being within the reAct project. Our findings suggest that the interaction with peers and teachers is an essential component to improve a sense of belonging. Several of the proposed practices can be substantiated by reAct, which include the i) public celebration of success (final presentations), ii) a shift towards more attention for citizenship and personal education, iii) and the notion that some students need more attention and care than schools can provide.	
4. Curricula, assessment and learner pathways	A cluster of good practices / key indicators relating to the curriculum and assessment frameworks that are set in place, including: **Learner assessment** 4.1 motivational strengths-based approaches towards learner assessment; formative assessment as a tool for confidence-building; 4.2 validating competencies acquired both within and outside of school, as evidence of individual progress. **Structuring learning** 4.3 flexibility to start at different times of the year, and to catch-up if needed; 4.4 flexible organization of the school day and week; 4.5 distance learning and weekend study arrangements; 4.6 access to childcare and specialist support. **Curriculum development** 4.7 employer engagement in curriculum development 4.8 arts and sports as a core activity within the curriculum 4.9 place-based study topics and projects **Progression / learner pathways** 4.10 contextualized careers advice and coaching; 4.11 clear and meaningful vocational pathways, linked to the local labor market.
Our findings strongly support the above suggestions: in all cases, we identified a clear need for a strong assessment framework and more consistent feedback that was in line with students' expectations and ambitions and provided evidence to the students that they were doing something valuable and meaningful. *One of the success factors in GR (Greece) was the flexibility of the program, enabled by the management, which translated into more time for informal interaction between teachers and students, and the inclusion of topics proposed by students in the program.* *We found particular evidence for 4.7 and 4.9, i.e. i) the involvement of practitioners, preferably by providing students support and opportunities to undertake activities (e.g. interviews) to interact with relevant professionals, and ii) the relevance of studying topics with a local significance (e.g. local history). The personalized support, provided by some teachers, was very effective, but challenging for the teacher. Adaptable pathways for personal development should be developed that allow students and teachers to develop a personalized and*	

Themes	Characteristics & indicators
meaningful learning trajectory. We made a suggestion for a tool to support this in Appendix XIII. In addition to place-based topics and projects, cross-curricular projects can be considered appropriate and valuable, and consequentially, this involves higher level of collaboration between teachers. *Finally, in several cases (GR, NL1, NL2, AU, SP1, SP2), linking activities with employment opportunities was an important strategy to engage students.*	
5. Pedagogy	A cluster of good practices / key indicators relating to the pedagogical methods that are deployed, and the staffing structures that support them. These include: 5.1 multi-professional social pedagogical teams, including psychologists, youth workers and health and social care staff working alongside teachers; to provide a more tailored academic, vocational and life skills offer to learners; 5.2 team teaching as mainstream practice, to provide opportunities for peer learning and assessment between teachers and to transfer expertise for working with learners who have complex needs; 5.3 low teacher to pupil ratios; 5.4 action learning methods – practical and project-based alternatives for working towards the attainment of mainstream qualifications; 5.5 social and peer learning – potentially including talks by young adults who left school early, to raise awareness of the consequences.
Our research had a strong pedagogical focus and findings are broadly in line with the above suggestions. Importantly, we argue that teacher support and training is necessary to accommodate teachers in employing new pedagogical approaches. These new pedagogical approaches may include team teaching (or collaborative and peer-based learning activities) and action-oriented and project-based learning activities, as suggested by our framework. Smaller cohorts and more time per student allow teachers to personalize the support, which was overwhelmingly appreciated by students. Finally, a number of additional suggestions were made, including integrating students' proposed topics to curriculum topics to create cross-curricular projects supported by different teachers, deliberate and 'smart' use of ICT, creativity, (collaborative) reflective activities, and scaffolds that facilitate self-guidance. Our framework and the individual principles are comprehensively discussed in chapter 6.4.	
6. Learning environment	A cluster of good practices / key indicators relating to the physical learning environment within the school. These include: 6.1 multi-site planning and organization of learning, with delivery at different school, work-based learning, arts and community locations; 6.2 ergonomic design: school spaces designed around learner; integration of social and learning spaces, innovative use of ICTs; tacking negative connotations of the traditional school environment and buildings.
One of the more engaging elements, described in several of the cases, was the opportunity provided and seized by many students to venture out of the classroom and explore local surroundings, the city, local architecture, gastronomy, and more. Clearly, students did not conform to the notion of the classroom as learning environment, rather 'the world as your learning environment'. The Internet was also used to explore, but, as we've seen, with some challenges. Our positive experiences with regard to the organization of short internships and	

Themes	Characteristics & indicators

explorations beyond the school can be added to this list. We also have anecdotal evidence of the influence of a self-organized learning environment (NL1) on student satisfaction and classroom dynamics (lowering barriers for peer-based learning).

7.2 Policy Implications[30]

Our study offers suggestive evidence for further adoption and calibration of the reAct approach and framework in various educational settings in Europe. Our design framework can be used in follow-up projects of this kind to anticipate on the kind of challenges practitioners are likely to meet. The problem of unemployed, disengaged, and disconnected youth, as identified in the first chapter, has not disappeared. At the same time, educational systems in Europe are still characterized by a move towards decentralization on the one hand, and strict standards-based evaluation policies on the other, as described in detail in the chapter 3.1.4 - The Limits and Flaws of Test-based Accountability.

To prepare and enable individuals to enable meaningful participation and enable them to make a positive contribution to society, education needs to address societal changes, including the increasingly digitally-mediated nature of human activity. Trends such as the interest in and integration of 21st century skills and competences into school curricula across Europe, and range of research initiatives[31] at European national and local levels reflect awareness of this challenge. However there are several key issues that are acting as obstacles to effective change.

The first of these is the difficulty of integrating, into the educational activity, the reAct approach as a means to foster 21st century skills. The content-focused structure of most curricula militates against a focus on these skills and teachers tend to focus on the subject, rather than the skills that would enable and empower learners across subjects (as shown in various reAct pilots). The Eurydice report of 2012 (EC, 2012b) points out that although these skills are fundamental to the preparation of young people for the current labor market, in general schools still do not give them sufficient attention compared to basic competences, and the development of some of them such as 'sense of initiative and entrepreneurship' is largely absent from the majority of curricula (EC, 2012c). There is an abundance of

[30] This section draws from our proposed follow-up project for the EU's LLP 2013 Call for Proposals.

[31] A list of relevant EU funded initiatives and reports can be found here: http://eacea.ec.europa.eu/llp

literature in the area of 21st century skills, but we propose a particular focus on information literacy (i.e. Bruce, 2004; Markless, 2009; Voogt & Knezek, 2008).

The second issue is that, despite the development and validation of successful approaches, educational innovations often fail to become integrated into the everyday activity of schools. This is frequently due to the fact that pilots take place in privileged spaces outside the mainstream, and more widespread adoption requires changes at all levels of the curriculum (from curriculum design through to classroom implementation) that are complex to implement, clearly demonstrated by cases such as IT, NL2, and AU. Frequently the lack of strong evidence of the potential effects of the innovation on learning outcomes is an obstacle, and furthermore for many teachers a lack of effective support in implementing innovations is also an obstacle. The nature of the context is important, issues like the degree to which the *curriculum is externally defined*, whether there is *flexibility to change* the order of events in the curriculum, the degree of *prior experience of project based learning*, the kind of *assessment system* in place and the *teaching and learning culture* of the institution all affect the degree to which the pedagogical principles underpinning reAct can be applied. It is suggested that the *diagnostic template* outlined under Principle 8: Measure and improve (chapter 6.4.3) is further specified to allow educators and managers to anticipate on likely challenges and to facilitate the use of the design framework in different contexts.

The third issue is, and the main focus point within the reAct project, remains the challenge of learner motivation. Our findings suggest that giving learners a greater degree of autonomy to direct their own learning, providing them with opportunities to develop their creativity, and providing them with opportunities to collaborate both locally and internationally on projects *can* lead to increases in their motivation and the development of relevant 21st century skills and competences (such as learning skills, sense of initiative, and media literacy) and their social and personal development. In several pilots (GR, SP1, SP2, NL1), the effect of the approach on the learners was substantial.

However, the focus of reAct was on piloting the approach with the learners themselves, and during the project it became clear that in order to consolidate and mainstream the approach to achieve wider ranging outcomes, it would be necessary to address the challenges described above, including i) the need for curricular integration of the approach, which requires the involvement of decision-makers; ii) the need to develop ways of assessing the development of the learners in order to provide evidence of the emergence of relevant (21st century) skills; iii) the need to develop support for teachers due to the change in their role in this approach; and iv) the need to develop the perspective of online and international collaboration.

The nature of these challenges require an approach that involves all the key stakeholders involved in educational change and their perspectives of curriculum,

educational research, schools, and individual teachers. Our design-based approach involving case studies seems appropriate, since it focuses on fostering local change and ownership *and* generalization of results. The participatory approach to the local adaptation of the approach and its integration and evaluation requires teachers to be fully involved from the very start of the project. They conduct small experiments with the approach in their classes, which they then reflect on together with the policy and research partners. This shift from top-down, hierarchical design to a more holistic approach ensures that all the perspectives that are necessary to ensure the methodology is fully appropriate to the school context are included in the design. However, with regard to the validity of research instruments, we suggest a stronger lead by principle investigators in the design of the research instruments.

7.3 Future Research

An important advantage of case studies over statistical methods and formal models are their capacity to address and describe causal complexity (George & Bennett, 2004). The holistic pedagogical design framework, proposed in the previous chapter, is the synthesis of findings of all cases and represents a complex web of factors and relationships. A logical first recommendation for further research is the actual validation of the framework in new educational projects and contexts. The research would benefit from a combination of two different approaches.

The first concerns a replication of the reAct approach with a particular focus on the notion of interest-based learning. Improved and validated instruments (see for instance Hulleman & Harackiewicz, 2009; Renninger & Hidi, 2011) can be applied to understand levels of interest as well as scope of interest, and test the hypothesis that students are diversely motivated and that these interests can be categorized using the proposed four dimensions. A second element that needs further investigation has been addressed before, and concerns the challenge of providing effective support and assessing activities, while at the same time respecting students' autonomy to explore and learn. More specifically, a future research could focus on the particular skills and attitudes required to autonomously engage in projects, which could benefit from research in the field of *heutagogy*, which is an approach to learning and teaching that places the emphasis on self-determination and learner-centered design (Blaschke, 2012). Such research may result in strategies and tools (e.g. badge infrastructure) to assess self-organized and self-guided learning activities and strategies to address and value soft skills such as self-motivation, self-reflection, and information literacy. In addition, the research may contribute to research in online peer-based and collaborative learning (e.g. Ahn, Weng, & Butler, 2013; Cress, Stahl, Ludvigsen, & Law, 2015; Fetter, Berlanga, & Sloep, 2011; Hennis & Lukosch, 2011; Hennis, Lukosch, & Veen, 2011). Predictive instruments and theories, including theory of planned behavior (Ajzen, 1991) and behavioral models

(i.e. grit and self-control: Duckworth & Gross, 2014) can be used to uncover moderating factors that influence acceptance and effects of activities and strategies.

To complement the above design-oriented approach focused on the pedagogical aspects, we suggest a predominantly quantitative approach aimed at improving the *diagnostic template* discussed in the previous section. This approach would involve the evaluation of existing innovative programs in different educational and institutional contexts. The IPO-model (input-process-output model, chapter 6.4.3) can be used as an initial high-level research framework to conduct the evaluation, which has the purpose of identifying and validating relationships between the context, the educational process (pedagogical and organizational decisions, support), and the (desired) outcomes. The combination of these two approaches, design-oriented research to test and further improve our proposed design framework *and* quantitative study of existing innovative educational initiatives, may improve the overall validity of findings.

A second recommendation, and inspired by the notion of *alternate reality games* (Whitton, 2009) and game design theories, concerns the concept of participatory game-design as educational process. I proposed and explored this concept during an international project on mathematics education, and integrates the notion of *'learning through design'* and *'distributed constructionism'* (Kafai & Resnick, 1996; Resnick, 1996). Instead of relying on peers to develop game designs, I proposed and developed an approach that would involve *teachers as content experts*, and involve *students as game designers*, with relatively high level of structure to facilitate the game design process.[32] The concept is based on the assumption that being involved in designing an educational game encourages *deep understanding* (and learning) about the (complex) system emulated by the game. Students *as designers* need to conceptualize the topic, understand the different levels of complexity, and transfer that understanding to the game, rather than just memorizing and replicating transferred knowledge. Obviously, students are not expected to arrive at understanding all by themselves, which points the attention to the more complex interplay between the *students as designers*, *students as experts*, and *teachers as experts*. Such meta-design framework has to balance the interaction between the participants in such a way that it maximizes engagement and learning, and minimize the reliance on teachers. The concept may seem challenging, practical

[32] An initial framework was developed based on game-design literature as well as discussions with colleagues (game-design researchers), and tested during a 2-hour workshop (2014). The design framework (work in progress) can be found online: http://bit.ly/14mY3yf

implementation is even less trivial, even though it explicitly does not rely on coding skills or knowledge of game design software. After validating the concept in a small-scale and controlled classroom environment, further iterations can extend the concept using ideas from *distributed constructionism* (collaborative game design using networked technologies) and *alternate reality games*, possibly leading to participatory, collaborative *learning-through-design communities* that develop and maintain game designs that integrate real-life scenarios, open data, transmedia storytelling, and participant input.

Such innovative research demands a design-oriented, and even action-oriented approach to arrive at a validated and useful first design framework to support such practices. In addition to the meta-design framework, the research may result in an improved conceptualization of distributed learning through design, the skills involved, and the identification of roles in a productive *learning-through-design community*.

A number of other recommendations can be done, including further research into adapting and testing the approach with students with disabilities, experimental studies that investigate the effects on (prolonged) engagement between strategies that depend on teacher-direction and structure and those that rely on patience and self-motivation (for an example of 'patience' as teaching strategy, please see case NL1), integration of flow-theory and game-design theory on the proposed design framework, the role of cultural background in relation to attitudes towards of novel pedagogical approaches (relevant for education targeting *(young) migrants*), the notion of *presenting* and *sharing* in relation to motivation, and exploring the benefits and challenges of collaborative teaching and guidance.

7.4 Limitations of the Study

One of the characteristics of a 'quality' design-based research is that it is 'being situated in a real educational context' (T. Anderson & Shattuck, 2012). Rather than strictly controlling for variables and conditions, and imposing a single intervention across different contexts, our study was concentrated on exploring the reAct approach in *different settings* and described both implementation and results per setting, resulting in a high ecological validity. Two important project characteristics influenced our preference for ecological validity over experimental control. First of all, we worked with various partners in different educational contexts in different countries, and it would be naïve to consider the possibility to control for the significant variety of conditions and implementation. Secondly, rather than an interest in measuring the impact of a single, highly specific intervention strategy, we wanted to know about the different conditions (largely unknown at the start of the project) in which at-risk learners were educated, and how to improve the learning experience in these conditions. Not controlling for these conditions was, in our research setup, an imperative to get valuable results and produce pedagogical

design principles. Usually, a high ecological validity improves the external validity, because the experiment or intervention took place in a realistic or real environment. *External validity* concerns the generalizability of the outcomes and may be affected by sample bias or other characteristics of the study that would limit generalization. Through a cross-case analysis of eight comparable educational contexts, we were able to draw conclusions and develop design principles that went beyond the results per case.

Using the same approach in a diversity of settings, one can assume that our research approach, findings, and design framework may offer useful guidance for relevant future projects and bottom-up educational projects in settings similar to any of the cases. Although the case studies represent a complex diversity of approaches, participants, and conditions, one can safely assume that the variety of educational contexts in the EU is larger. However, the identification of several high-level context factors facilitates the translation of our results to new contexts.

A common challenge within design-based research is that *"by trying to promote objectivity while attempting to facilitate the intervention, design-based researchers regularly find themselves in the dual intellectual roles of advocate and critic"* (Design Based Research Collective, 2003, p. 7). In our research, this dual role of advocate and critic was most prominent in the two cases from the Netherlands, while a more distant role was required in the cases in other countries. This combination – of 'advocate' close to the action (NL1, NL2) and a more distant, descriptive role (other cases) – improved both the internal validity (through the comparison of personal interpretations with data from other cases) as well as external validity. The requirement of local partners to report experiences in pilot reports further improved the validity of the research, because it allowed us to compare our own interpretation based on the original and raw data sources with the local partner's interpretation expressed in the pilot reports.

Despite the above measures to enhance validity of the research outcomes, there are some concerns with regard to *internal validity*. It may have drawn the attention of the attentive reader that, although questionnaires were used in the research, few *stand-alone* statistical results were presented. We did so for several reasons.

First, by presenting graphs and tables as stand-alone outcomes, an assumption of validity of the presented results is rather easily made. However, because questionnaires were conducted indirectly, with diverging response rates and overall low sample sizes, we chose to combine the results with other, complementary sources to create a more coherent, consistent, and comprehensive picture of each case.

In addition, the questionnaires were designed to serve multiple purposes, most importantly to support the evaluation of the reAct project (and approach). During the development of the questionnaire items, a collaborative approach was adopted,

with the aim to reach consensus on questionnaire items. As a result, *construct validity* of several items, such as development of skills and attitudes, seemed weak in retrospect. Only through methodical triangulation, i.e. by combining different data sources, we increased the validity of the research and inferences could be made about the actual impact of 'the reAct approach' on such things as skills and attitudes. Better construct validity, especially concerning essential constructs such as engagement and interest, would also be one of the recommendations for future research as well as future education (i.e. assessing students in a more internally valid manner to be able to demonstrate the relevance of their participation).

A third reason concerns the low questionnaire response towards the end of both pilots, which made the outcomes less representative for the entire cohort. The lack of response was indicative, however, for lack of engagement and interest in participation.

In retrospect, a more consistent and thorough *profiling* of participants, students as well as teachers, before, during, and after the project, would be helpful to analyze the complex interrelationship between the participant backgrounds (skills, attitudes, motivation level, cultural factors), pedagogical approach (design, focus, elements), and effects (short-term and long-term).

7.5 Personal notes

This research was part of a PhD process that was often exciting, and occasionally, frustrating and difficult. On various points in the research, I reconsidered the choices I made that constituted the research and wondered whether or not I would be able to make a valuable contribution. In the end, I am glad I persisted, and the results are, with respect to my earlier doubts, positively surprising. My personal classroom experiences (NL1, NL2) were of vital importance to better comprehend the intricacies involved in implementing the reAct approach, and allowed me to better situate the occasionally ambiguous information about other cases. Witnessing directly the frustration experienced by teachers after several unsuccessful attempts to re-engage a student put my feet on the ground and understand that different students may require more support and time than is realistically feasible. Having a wife who is a teacher also helped tremendously in making the sometimes difficult transition from theory to practice. *"Mmm… not so sure if that is very practical, because..."* were among the best suggestions I received during the PhD process. It's therefore appropriate to end with the following quote:

"I posit that whereas envisioning new pedagogies is about the art of thinking "big," implementing these pedagogies is a science of details. A Freirean pedagogy can only survive if it permeates the mundane. Grand discourses about emancipation are not enough. The most significant part of students' learning experiences resides in the small power struggles, the minute decisions, the microscopic choices of what to teach and what to value, who has voice, who ultimately decides. It is precisely in those apparently

insignificant pedagogical and personal transactions that the essence of the atmosphere is constructed." (Blikstein, 2008, p. 230)

The ultimate decision what to teach lies, in Freirean tradition, with the teacher. The ultimate decision what to learn lies, in the reAct tradition, with the learner.

… por fin.

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APPENDICES

Appendix I STAKEHOLDER ANALYSIS INSTRUMENTS

As part of the preparation of the project and design of the reAct approach, we conducted an extensive qualitative stakeholder analysis. The interview formats for managers, teachers, and students can be found below. The main objective was to develop a better picture of the problem situation, and to elicit requirements for the framework and supporting materials to facilitate implementation of the reAct approach.

Manager interview format

Purpose of the interview:

Learn more about their

- Attitude towards learning, technology, and ideas about the target group
- Personal access to ICT and the use of ICT (special knowledge, finished any courses, exploring ICT with the help of friends)
- Organizational issues; required resources, structure
- Educational programs: organization, pedagogy, length
- Problem & vision: main issues, possible solutions

Topics:

Here we try to get information about the background of the person we interview. How did they get involved in this work, what is their position, what is their background in the field?

Keywords: Demographic data / background / position in organization / background in the field

Experience with target group & Pedagogical vision

Here we focus on the interviewee experience with the target group, their conception of the main issues that play a role (social background, access to education, psychological issues, etc.), possible solutions and ideas for solving or preventing the problem.

Keywords: Problem statement, prevention, ideas about motivation, ideas about learning and pedagogy, experiences, difficulties, conclusions

Organization, educational program and pedagogy

Here we focus on the approach of the organization, the structure of the program, the network in which it operates, the skills required by the employees, the costs involved, the most important challenges they face, and opportunities to make things better for the dropouts.

Keywords: Structure of the program, roles, participants, organizational structure, costs involved, challenges.

Technology

Here we specifically focus on the use of educational technology and ICT in the organization, for learning, and by the dropouts themselves. We also want to know if the provision of ICT would cause difficulties in the organization or would be rejected by students.

Keywords: Use of, and access to technology by organization, mentors, and students. Required technological resources. Willingness to adopt technology.

[end of 'Manager interview format']

Teacher/trainer interview format

Purpose of the interview:

Learn more about their

- Attitude towards learning, technology, and ideas about the target group
- Needs and requirements
- Personal access to ICT and the use of ICT (special knowledge, finished any courses, exploring ICT with the help of friends)

Identify the skills, needs, and factors related to the lack of motivation (or in case what helped them to get motivated to join the current study programme)

Topics:

Age, Sex, City/region (rural, urban, industrial region)

Position in institution: in the organisation, in the programme

Working with target group for … years? Training experience with the target group = aged 16 – 24 years, not finished school / description of target group and problem.

Professional background

- Occupational history, professional development
- Quality of the professional experience
- Professional experience and learning

Educational background

- Qualifications, advanced training

ICT-knowledge/ access to ICT and internet

- Internet, Mail, Chat, social networks, eBay, Google, Wikipedia, games,…
- ICT already at school, own computer, internet access (at home, with family, with friends,…)
- Other software and tool use; online search, RSS, social networking

Experience with e-learning tools / technologies

In general; personal; with the target group; in the programme

Necessary working environment

According to the trainer's experience: what is necessary to implement e-learning tools successfully in such a program.

Restrictions

What are the restrictions the trainer is facing in this organisation, in the programme, teaching the target group?

[end of 'Teacher interview format']

Student (participant) interview format

Purpose of the interview:

Learn more about the participant regarding

- Attitude towards learning
- Study program he /she is actually in
- Personal background
- Socio-economic context the participant is living in, faced with
- Personal access to ICT and the use of ICT (special knowledge, finished any courses, exploring ICT with the help of friends)

Identify the skills, needs, and factors related to the lack of motivation (or in case what helped them to get motivated to join the current study programme)

Topics:

Age, **Sex, City & region** (rural, urban, industrial region)

Socio-economic context (family background, peer group, social behaviour, hobbies)

- Family background – parents, brothers and sisters, married, children, living with family, with friend(s), alone, …
- Family economic level
- Peer group – common interests, activities, ….
- Social behaviour, hobbies – concerts, hanging around, fire brigade, music, rescue service, soccer, climbing, …
- External economic help
- Social services Availability

Professional background

- Field, duration, workplace learning, training on the job,
- Vision – career – career perspectives – plans
- Professional specialty
- Quality of the professional experience

Educational experience

- Type of school (main focus of school)
- Favourite subject – why?

- Disliked subject – why?
- Left school because of……?
- Relationship with teachers
- Relationship with group of mates
- Thoughts about self-efficacy

Learning barriers / ways to reduce those barriers

- Classroom situation, spirit, learning atmosphere, teachers, working hours – schedule, no interest in offered subjects, boring content/didactics, ….
- Influences by class mates, friends, family, peer group
- Scanty family support to his/her studies
- Scenario how to prevent a boring learning environment how to offer a inspiring learning environment
- Emotional difficulties (low self esteem, high level of anxiety, …)
- Vocational uncertainty

Motivation to participate in current course

- Sent by an official organisation, friends, family, cash, change of attitude, chance for better job, vision for the own future/dream – current course is the first step/ the basis to realise one's dreams, to proof (the family) one's persistence
- Match between personal interests and course specialty
- Interest in theory/practice learning periods
- Personal skills to carry out the course
- Outcome expectancy after doing the course

ICT-knowledge/ access to ICT and internet

- Internet, Mail, Chat, social networks, ebay, google, wikipedia, games,…
- ICT already at school, own computer, internet access (at home, with family, with friends,…)
- Software use – Resource search on internet – RSS use – Social network profile

[end of 'Student interview format']

Appendix II PARTNER PREPARATION INTERVIEWS

In preparation of the pilot design framework and pedagogical principles, we interviewed all partners to obtain an overview of the conditions in each context and the differences between contexts. We asked about the target group (students and teachers), expectations, and experiences with ICT. To illustrate the content of the partner interviews, a summary of one such interview is included below.

Date: 7 April 2011 (Skype, 1hr) / Interviewee: Elmo de Angelis / Interviewer: Wim Veen

Courses planned

Training 2000 will work as an external consulting agent for three public schools at secondary vocational level:

- A technical school;
- An accounting school;
- A business administration/drawing design school.

Each school will create a small group of students varying between 10 to 13 students between 15 and 19 years. In each school 2 or 3 teachers will participate in the experimental setting.

Course length

Courses will run during the whole school year 2011/2012, starting in September 2011. The curriculum will be the same as for the regular students in school. Students are expected to work through the same content at the same level as the other students in school. Students are supposed to pass to the next level by the end of the school year. Elmo considers this circumstance as a real challenge.

Target group

Students

Students are regular students of the public schools involved, but compared to others, show a high degree of demotivation and disinterest in school and learning. They are known as 'lazy' students, and are expected to miss classes as soon as the weather is getting better. They still attend school, but considered as pre-dropouts.

The students have a working class background where parents show little interest in schooling. There seems to exist a low motivation for education or getting up the social ladder in society. What seems to matter is to work for money as soon as possible, gain money and buy a car.

Students are almost all Italian families. 20% of them have Afro origins but speak Italian without accent. There is no language issue here.

Students like to use Facebook for their own fun.

Teachers

In general teachers do not seem to be motivated for their profession due to low salaries. They are the first not to update their knowledge. For the teachers who will be involved in the special classes, younger teachers will be attracted between 25 and 40, as it seems they are less reluctant to technology and showing more motivation for innovative pedagogical approaches.

Goals of the Pilot

- Create new ICT enhanced pedagogical approaches to avoid students dropping out from school;
- Spreading the innovation into teaching staff of the whole school;
- Motivating the upcoming dropouts for learning by using a different pedagogical methodology and related innovative tools.

Requirements regarding Tools and Platforms

Moodle will be used as a depository tool where content can be stored and shared. Moodle will also function as an environment that can be used for showing to external governmental bodies what has been achieved. Teachers are acquainted to Moodle. But next to Moodle other tools, more attractive to students, will be necessary for communication and collaboration. Currently, students and teachers are using Facebook, Skype, and email. Social software in general would be nice, heading towards Web 2.0 environments.

At one of the schools Elmo mentioned Facebook as a tool, which was received with much skepticism by teachers. However, the manager was very interested.

Expectations from pilot design and framework (Work Packages 2&3)

- WP2 should offer a set of usable and attractive tools on the basis of the interviews held with all partners. Tools should be linked to pedagogy because the methodology will be crucial to create momentum in the schools;
- WP2 should address the teachers involved in the experimental classes;
- WP2 should not prescribe, not giving recipes, but a 'possible guide';[Here we ask for expectations from the partners: involvement.]

Elmo agrees on the WP2 goals as described by Elvira & Markus:

- A description of pedagogical approaches of ICT enhanced learning;
- A clear list of tools on the basis of the above-mentioned requirements;
- A description of what the tools do;
- A description of how to use them in the classroom.

Teach the trainers first

Teachers will be trained during summer holidays (another challenge). The training will probably run through approximately 2 weeks time and will focus on the use of tools and their application for teaching. In May Elmo will present his plans for this training to the teachers.

Data collection for evaluation

Elmo underlines the need for a clear research and evaluation framework for collecting data in all partner countries. This framework should be available before September as most experiments are going to start by that month and partners should know what data should be collected from the beginning of the experiments. It is expected that Nick would come up with such a research framework.

Last issue

Elmo considers timing as an important issue as he should know from May on what he is going to do in September.

Appendix III PARTNER EVALUATION INTERVIEWS

After the second pilot, and before the official end of the reAct project, an external evaluator (Nick Kearney) conducted an evaluation of the project, which included interviews with partners. This happened over the summer of 2012. One such interview has been included below.

Date 9 July 2012 / Interviewee: Anabela dos Santos / Interviewer: Nick Kearney

1. What adjustments to the methodology did you have to make during the 2nd pilot in your context. Do you feel these changes were successful? Is the way you implemented REACT specific to the context of the school where you carried it out, or would it be adaptable to other contexts.

The adjustments made were in result of decisions from the coordination and online meetings, in accordance to the rest of the partners. There were no adjustments in Portugal because of the context.

The way reAct was implemented here would be adaptable in any context, because we followed the reAct principles, but there is a small detail that we have to consider: they are adult learners, following a course prepared in a project-based curriculum.

2. How did the teachers react to the methodology, before, during and at the end? What is your impression of the effect on them of this process?

Their reaction was very positive, at the beginning (September) and at the middle. Let me recall that our teachers were the same in Pilot 1 as in Pilot 2, only the students were different. At the end of the second pilot, they seem very tired but I suppose that all teachers are very tired at the end of a scholar year. Nevertheless, they still show some enthusiasm about the reAct methodology and claim that they intend to use it in other contexts. I noticed a slight difference in their behavior toward their peers: they are more confident, some of them developed a team-working style, some acquired new technological competences, they seem proud to be part of an international project.

3. How did the learners react to the methodology, before during and at the end? What is your impression of the effect on them of this process?

On this second Pilot, the students were very different from the first group. This second group was interested and motivated but they seem to be AT SCHOOL. I mean that they perhaps missed the creative part of the project. They were always waiting for indications from the teachers. Less autonomy is also perhaps an answer to "more scaffolding"... About the effect on the learners, I am still wondering.

4. What are the strengths of REACT in your view? And its weaknesses?

Strengths: the principles. The teachers training around the principles. A new approach in the classroom and out of it (social media allows a wider perspective).

The project-based organization, so the students are defied to be creative and autonomous.

Weaknesses: the communication factor, the common language issue, different from the mother tongue seems to increase difficulties. Too great a jump in the use of technology between what happens in traditional curriculum and in a reAct project.

5. When you disseminate, or describe REACT to people not involved in the project, what kind of reactions do you get? How do you respond to these reactions?

The reactions are always very nice. We talk about motivation, creativity and autonomy. We talk about the need of change in education, there is a common agreement about this urgency. Then people asks about the results and my answer is always that we'll have to wait to be sure, because there are so many factors in measuring motivation!

6. REACT ideally should be sustainable after the project ends. What challenges do you envisage in relation to this?

reAct is sustainable IF there is teachers training. Absolutely fundamental. We have to create a European stamped training workshop for teachers and spread it all over Europe.

Appendix IV TEACHER INTERVIEWS

Teachers were interviewed after the second pilot, following a semi-structured 'After Action Review' protocol, addressing experiences, results, ideas for improvement, relevant moments, strengths, weaknesses, opportunities, and threats (SWOT).

What was planned?	What did you want to achieve with the reAct approach? How did you want to achieve this? What did you expect to happen?
What really happened?	What kinds of activities did you organize? What happened? In line with expectations?
	What barriers have you encountered? How did students cope with the reAct approach? How did you cope with them.
	Which tools have you been using? How did you/they use it?
	What are the most exciting results you have seen, are there things you are proud of? What do you consider as a success?
	Are there things you have learned to do otherwise? Are there things that went wrong or did not meet your expectations?
Why did it happen?	What was the reason behind the mentioned successes and failures?
Prospects and confidence	How are you going to improve your approach? What are you going to do differently?
	Do you master the reAct methodology sufficiently for future use? Are you confident enough to continue working with this methodology?
Integration	Are you satisfied with the level of integration of reAct in the formal curriculum?
SWOT	• Strengths: What are the strengths of the methodology? • Weaknesses: What is still missing from the methodology? Which of the elements are problematic? • Threats: what external elements/factors can you mention that would be threatening for successful application of the methodology? Which external factors MUST be taken into account in order to successfully apply it? What would be a good strategy to do that? • Opportunities: Can you think of opportunities with regard to the implementation or integration of the approach?

Appendix V TEACHER QUESTIONNAIRES

Before, during, and after the second pilot, teachers were asked to fill in a questionnaire. Below, we included the teacher pre- and post-questionnaires, which respectively deal with background, expectations, and current didactics/pedagogy and experiences with reAct. The mid-course questionnaire contains the same questions as the (slightly more extensive) post-course questionnaire. The surveys were translated into the local language. Starred questions are open questions.

Pre-questionnaire (TQ-0)

Background information

1 [BG1] Age

2 [BG2] School / Course

3 [BG3] Experience in teaching (yrs)

4 [BG4] What topics do you teach? * (open)

Current pedagogy and reflection on reAct principles

Below, a number of statements and questions follow. Please reflect on them from your own experience, beliefs and ideas.

5 [PP1] Do you share/suggest new ideas and talk about innovative learning approaches in your organization? (Yes/No)

6 [YN3] What kind of ideas (briefly)? * (open)

7 [YN4] Why not?

Please choose all that apply:

- ☐ I am not supposed to do that
- ☐ It makes no sense to discuss other innovative learning approaches because it would not be implemented
- ☐ I do not feel comfortable sharing ideas with colleagues
- ☐ I do not feel comfortable sharing ideas with management
- ☐ We don't need innovative ideas
- ☐ I do not have innovative ideas
- ☐ Other: * (open)

8 [PP2] Do students come up with ideas and suggestions for the content or structure of the course? (Yes/No)

9 [YN1] Please describe the kind of ideas suggested by students and how you handle their suggestions. * (open)

10 [YN2] Why not?

Please choose all that apply:

- ☐ They are not supposed to do that
- ☐ They are not able to provide useful suggestions

- ☐ They are too shy to do that
- ☐ They are happy with how it is
- ☐ Other: * (open)

11 [PP3] For the statements below, please indicate the most appropriate option.

Strongly disagree || Disagree || Neither agree or disagree || Agree || Strongly agree

a) I feel comfortable in an interactive setting with students
b) I find my work as a teacher positively challenging
c) My students consider the learning content positively challenging
d) Students often get the opportunity to negotiate or define their own assignments
e) Students get the opportunity to set their own learning goals
f) I want my students to work autonomously (alone and in groups)
g) My teaching involves regular group-based work and assignments
h) My students like working in groups
i) Group-based learning is an effective method for my students to learn
j) I decide about the content and structure of my teaching: I am able to flexibly interpret the state or school curriculum and pedagogical approach
k) My students are allowed to propose their own learning goals, materials, and structure
l) An essential part of my teaching is creativity and creative thinking
m) Students are given the possibility to express themselves creatively (e.g. photography, music or painting)
n) I teach in a way that it relates with my students' interests

Technology use by teachers and students

12 [PP4] I use the Internet and web-tools to improve and support my teaching. (Yes/No)

13 [YN5] If 'Yes' (12): How do you use the Internet in your teaching? (choose appropriate response for each item)

Never || Sometimes || Often

a) Searching for content for my lecture (i.e. presentations, videos, or websites)
b) Follow blogs, websites, and people to keep myself up to date with the latest developments on teaching (Twitter, Facebook, blogs)
c) Using online resources in class to highlight topics or give examples (i.e. YouTube)
d) Doing research and find new things related to class (i.e. Google)
e) Using online tools to communicate (like chat or Facebook)
f) Using online tools to collaborate (like Google Docs)
g) Using online tools to express ourselves (like a personal blog or creative tool)

14 [YN6] Which specific tools do you often use and how? Any additional comments? * (open)

15 [YN7] If 'No' (12): Why not?

Please choose all that apply:

- ☐ I have no idea about how the Internet could support my teaching I have no idea about how the Internet could support my teaching
- ☐ I have no access at home I have no access at home
- ☐ I have no access at school I have no access at school
- ☐ I receive little support my institution to use the Internet I receive little support my institution to use the Internet
- ☐ I don't think the Internet is very helpful for my class or course I don't think the Internet is very helpful for my class or course
- ☐ Other: * (open)

16 [PP5] Any additional comments? Did we miss something? 8 (open)

[end of survey]

Post-questionnaire (TQ-2)

In addition to the Background questions (see above questionnaire), the following questions were asked after the pilot.

Impact & Experiences

5 [I1] What has been the influence of reAct on your work?

Very negative || Negative || Neutral || Positive || Very positive

Make a comment on your choice here: * (open)

6 [I2] Did the project change your view on teaching? (Yes/No)

Make a comment on your choice here: * (open)

7 [I3] What moment in the reAct project inspired you most until now? * (open)

8 [I5] Please indicate if you agree with these statements with regard to your own experience in the reAct project. (choose appropriate response for each item)

Strongly disagree || Disagree || Neither agree or disagree || Agree || Strongly agree

a) Individual attention for learners is important for success
b) I was able to give individual attention to each of the learners
c) My collaboration with the learners and other teachers fostered trust
d) Collaboration was an important aspect of my/our approach
e) Learners improved their collaboration skills
f) The international aspect was important in my/our approach
g) The international aspect broadened the learners' worldview
h) Learners adopted a more proactive learning approach

i) I was/we were able to create a challenging but manageable learning environment for the learners
j) The students discovered and pursued their interests
k) Learners learned to guide and control their own learning
l) Learners learned to express themselves creatively
m) The learners' view on learning was broadened
n) It broadened my view on teaching and learning

** Please note: This is not a competition; if none of the objectives were met, please indicate as such. This is an experiment and we want to learn from it.*

9 [I7] Similar to the previous question, please indicate how much you agree with the following statements. (choose appropriate response for each item)

Strongly disagree || Disagree || Neither agree or disagree || Agree || Strongly agree

a) I was able to clearly define the objectives and pedagogical underpinning at the beginning of the project
b) I was able to effectively and clearly manage expectations among the learners
c) There was an effective and clear planning for the project
d) I had sufficient time to prepare the project
e) I had enough support to prepare the project
f) The students had enough time per week to explore and work on their project
g) I was able to effectively monitor progress and intervene when necessary
h) The communication with other teachers was smooth
i) The communication with students was effective
j) The class had the appropriate level and background to introduce this methodology
k) International collaboration or interaction was effectively organized
l) We were able to effectively reflect on the process and outcomes with the learners
m) I was able to create commitment for the projects among the learners
n) I was supported by (non-reAct) colleagues from my school or institution
o) I was supported by management of my school or institution
p) The methodology sufficiently addressed or integrated the existing curriculum
q) I was able to make the methodology my own and apply it my/our own teaching situation

10 [I11] What skills were acquired by your students during the reAct project? Please first read the short explanation of each of the competences[33]: (choose appropriate response for each item)

Strongly disagree || Disagree || Neither agree or disagree || Agree || Strongly agree

a) Communication in the mother tongue
b) Communication in foreign languages
c) Mathematical competence and basic competences in science and technology
d) Digital competence
e) Learning to learn
f) Social and civic competences
g) Sense of initiative and entrepreneurship
h) Cultural awareness and expression

11 [I12] What is the role of a teacher? What kind of skills or attitudes do you think are necessary for teachers to be able to successfully support/guide students in a project like reAct? * (open)

12 [I13] When did you experience resistance among learners to participate or continue with the project? How many of them resisted? (choose appropriate response for each item)

Nobody resisted || Some resisted || Half of the students resisted || Most resisted || All resisted

a) When we started with the international project
b) During the international project
c) At the end of the international project
d) When we started with the local project
e) During the local project
f) At the end of the local project

13 [I14]How important were the following (potential) sources of resistance? (choose appropriate response for each item)

Unimportant || Of Little Importance || Moderately Important || Important || Very Important

a) Relation with students: Peer-pressure, or (potentially) no/negative feedback from peers

[33]Teachers were referred to the EU reference framework that summarizes the 8 'key competences' for lifelong learning: http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11090_en.htm

b) Relation with teacher(s): Teacher-pressure, or (potentially) no/negative feedback from teachers
c) Home situation: Pressure from social environment, (potential) negative feedback or low trust-relationship with parents or friends
d) Difficulty: Project is considered as too challenging, low self-esteem of learner
e) Negative about the value of education in general, i.e.: "Education will not make my life better, so why invest in it?")
f) Learner's idea about how education should be (prejudice/culture), i.e.: "It is the teacher's responsibility to tell me what to do")
g) Disappointing or unclear learning outcomes
h) Lack of basic skills (ICT, learning, project management, collaboration)

14 [I14b] Did you experience other sources of resistance? * (open)

15 [I16] How important were the following sources of motivation for learners? (choose appropriate response for each item)

Unimportant || Of Little Importance || Moderately Important || Important || Very Important

a) Inspiration and confidence from/relationship with teachers
b) Inspiration and confidence from/relationship with peers
c) Inspiration and confidence from/relationship with parents or friends
d) Growth of confidence
e) The feeling of being challenged
f) The opportunity to work on a personally relevant project
g) The opportunity to direct one's own learning path and project
h) Ability to express oneself creatively
i) Working in groups (collaboration)
j) Connection with the outside world / International context
k) Working with ICT

16 [I16b] Did you experience other sources of motivation? * (open)

Technology use by teachers and students

17 [T1] How did you or your students use technology during the reAct project? (choose appropriate response for each item)

Never || Sometimes || Often

a) Searching for content for my lecture (i.e. presentations, videos, or websites)
b) Follow blogs, websites, and people to keep myself up to date with the latest developments on teaching (Twitter, Facebook, blogs)
c) Using online resources in class to highlight topics or give examples (i.e. YouTube)
d) Doing research and find new things related to class (i.e. Google)
e) Using online tools to communicate (like chat or Facebook)
f) Using online tools to collaborate (like Google Docs)

g) Using online tools to express ourselves (like a personal blog or creative tool)

18 [T2] Which specific tools were used? * (open)

19 [T3a] How important were the following barriers for using ICT (including web-technology)? (choose appropriate response for each item)

Unimportant || Of Little Importance || Moderately Important || Important || Very Important

a) Access to ICT infrastructure or Internet
b) My ICT skills
c) ICT skills students
d) Inability to find relevant ICT tools

20 [T3b] Any other barriers for using ICT? * (open)

21 [T4a] Do you agree with the following statements? (choose appropriate response for each item)

Strongly disagree || Disagree || Neither agree or disagree || Agree || Strongly agree

a) The use of ICT improved creative skills and expression
b) ICT enabled learners to work more efficiently
c) The use of ICT increased learner motivation
d) The use of social media enhanced communication
e) Our experience with Diigo was positive
f) Our experience with Facebook was positive
g) Our experience with Google+ Hangout was positive
h) Our experience with Google Sites was positive
i) There has been too much emphasis on technology
j) Students were quickly distracted using ICT

Based on answers from the previous questionnaire

22 [T4b] What other benefits or drawbacks did you see in using ICT (including web-technology) for learning? * (open)

Organization, implementation, integration

23 [O0000] How was reAct introduced in your organization? *

- As an integrated element of the program
- As a separate activity of the curriculum
- As an extra-curricular activity

Make a comment on your choice here: * (open)

24 [O0a] How many hours per week were scheduled for the reAct project?

25 [O0b] How large was the group of students that started with the reAct project?

26 [O0b2]How many of them successfully participated until the end?

- All (90-100%)
- Most of them

- Half of the students (50%)
- Some
- (Almost) none (0-10%)

Make a comment on your choice here: * (open)

27 [O0c] What is your impression: was the reAct methodology applied successfully in your institution? (choose appropriate response for each item)

Very negative || *Negative* || *Neutral* || *Positive* || *Very positive*

a) Overall impression
b) Impact on learner motivation
c) Impact on teacher motivation
d) Learning to learn and promoting autonomy
e) Learning to collaborate
f) Impact on trust between teacher and student

28 [O1]How important do you find the following criteria with regard to your own continuation of working with the approach? (choose appropriate response for each item)

Unimportant || *Of Little Importance* || *Moderately Important* || *Important* || *Very Important*

a) A more concise description of learning objectives and a clear pedagogical underpinning
b) Support to connect or integrate the methodology in the existing curriculum
c) Regular and effective consultation/communication protocol with other teachers involved
d) At least one other teacher to do it with me
e) Awareness and support from my colleagues (not involved in the project)
f) Support from management
g) A better documented and clearer toolkit to support the student's projects

29 [O2] Any other aspects or criteria that were not in the list above? * (open)

30 [O4]Do you expect to continue working with the approach? (Yes/I don't know /No)

Make a comment on your choice here: * (open)

31 [O3] Do you feel confident enough to continue working with this approach? (Yes/I don't know /No)

Make a comment on your choice here: * (open)

32 [PP5] Any additional comments? Did we miss something? * (open)

Appendix VI TEACHER LOG BOOKS

We asked all participating teachers to keep notes and provided them with a structure. Below, we included one such logbook (the 3rd log book in the first pilot in Spain), to illustrate the information captured by these experiences.

Summary: Write about the main processes organized and their outcomes

During the international project, students presented themselves on Facebook, made contact with students from Italy and Greece, voted the projects they wanted to participate and participated in 3 projects: Modern Music, Animals Abandonment and online radio

Activities and processes: More detailed description of the specific activities organized by teachers and students. Describe the most interesting ones.

Students and teachers organized the following activities:

- They have dedicated several sessions during the school time to contact, through the International Facebook group("reAct International), with students from other countries, across several activities:
- They uploaded to Facebook digital posters where they presented their hobbies.
- The students participated in several conversations with students from other countries via Facebook chat.
- They suggested projects they were interested to work collaboratively with students from other countries.
- Students have voted these projects and finally have joined some of the projects that had Facebook fans.
- Students participating in the project have uploaded to Modern Music Facebook their links to their favorite musical videos and a slide presentation about the evolution of modern music in Spain (in English), within the Facebook group created for this project.
- The students of the project Abandonment Animals wrote two stories and a slideshow that was uploaded to Facebook.
- Students created an online Radio Facebook group and went different music links of their choice and uploaded some comments explaining how he would organize an online radio show, finally, due to technical problems could not be held.

Tools/Technologies: Which tools have been used? How did you/they use it?

Facebook: Students have used the Facebook group to contact International students from other countries.

Teachers used both Facebook groups: reAct and reAct International, to introduce themselves. Students have participated in the Facebook groups for projects Modern Music and

Animals Abandonment. They have contacted participants in each group and uploaded links and works. Students and teachers didn't upload any link to the site

reAct (https://sites.google.com/site/reactproject/) because the students weren't coordinators of different projects, but their jobs were reflected in the final works uploaded.

Other ICT tools:

- PowerPoint and Slideshare (slides and presentations About Animals abandonment Modern Music)
- You tube (selection of music videos)
- Open Office (write Stories about Animals Abandonment).

I am happy about: What I have been proud of, what I consider as a success

Teachers are proud of the students having used computers since the first day of class and this has helped the cohesion of the group of students from the very beginning. They also feel proud that the students have been motivated in the use of Facebook activities as they have fluency in the use of social networks and feel more confident in themselves. It has also been successful in the students autonomy as they demonstrated in the use of ICT tools

I could improve: What I could improve in the process

In the process it could be improved Internet connection as it was slow on many occasions, despite having specially a connection contracted for their classroom. Teachers commented they have not spent enough time on international projects and they have continued their regular classes during the time as well as working on the different international projects. It could be improved the contact between students, despite having installed the Google Toolbar, students did not feel comfortable to contact students who have a different language. Collaborative work with students from other countries has been limited, and we believe that spending more time could improve the implementation of projects during school hours.

Students attitudes and results obtained: Overall evaluation of how students have accepted the proposed activities

In general students have voluntarily accepted the proposed international activities, but they were not much involved because teachers have not given enough importance to these projects. These students are really dropouts and attend classes in the same training center where they have failed in the previous year. For this reason, the attitude of these students is initially rejection to any training initiative. One of the main objectives during the classes is to maintain order, normal behavior and get their interest in the projects they face.

Teachers are satisfied with students, despite the daily difficulties, the students say that this course is completely different to those who had attended the previous year and perceived that teachers allow them some freedom in daily activity that some of the students still have not learned to manage.

The teachers need to have an extensive training in ICT and to develop very specific activities in the classroom, because this profile of students, sometimes conflicting,

does not allow teachers feel insecure on the approach of daily lessons. This is the main reason because the teacher do not feel confident with the methodology, and prefers implement TICs without let the students managing their own learning process.

Communication

Communication with the other participants has been limited and very punctual moments.

Appendix VII STUDENT FOCUS GROUP INTERVIEWS

Focus group sessions and interviews with students about experiences after each pilot, and when appropriate, partners reflected on summarized questionnaire outcomes and results.

Experiences

- What did you do?
- Did you enjoy it?
- How would you describe reAct to your friends or parents?
- What was difficult?
- Why was that difficult?
- Did you have a good idea about what you were doing?
- What did you learn during this course? Do you think that is important?

Reflection on principles

- Trust, trusting, being trusted, trustworthiness → Did you see other students' confidence growing or not? If so, why did that happen? How is your relationship with teachers normally? Was it different in this project?
- Challenge, being challenged, challenging, too challenging → Was this project difficult? Did it engage you? Why (not)?
- Self-guidance, self-monitoring, self-directed learning → Could you describe the process and your role from beginning to end? What was the role of the teacher? Do you feel confident of doing a project on your own? And before reAct?
- Ownership, control, influence → Did you feel you were able to decide what you wanted to do? How was that?
- Creativity → How would you define creativity? How does that apply to the reAct project? And to you?
- Collaboration, group work → Have you worked alone? No; what did you do with others? Yes; were you ok with that? What would you do next time?
- Relevance → Was what you did in the project relevant to you?
- ICT → What do you think about using ICT in this project?

Appendix VIII STUDENT QUESTIONNAIRES

In both pilots, students were asked to fill in a questionnaire before, during, and after the pilot. In the pre-questionnaire, students were asked about their background, motivations, and expectations, while the other questionnaires were more directed at their experiences with reAct. The questionnaires were translated into the local language and were available in English. Students were able to choose their preferred language (some participants were more proficient in Spanish or English than the local language). Starred questions were open questions. Below, we have included the pre- and post-questionnaires of the second pilot. The mid-course questionnaire has not been included because it contains the same questions as the (slightly more extended) post-course questionnaire.

Pre-questionnaire (SQ-0)

Background information

1 [BG1] Age

2 [BG2] Gender

3 [BG3] Mother tongue (Native language)

4 [BG4] School / Course

Motivation to be in school

5 [M1a] Did you ever drop out of school or have you ever thought of quitting school prematurely? (yes/no)

6 [M1b] What was the reason?

Please choose all that apply:

- Time schedule
- Location was difficult to reach
- I had problems with other students
- I had problems with teachers
- It was difficult
- It was uninteresting
- Problems at home
- Financial problems
- Other * (open)

7 [M2] How much time do you spend on the following learning activities? (choose appropriate response for each item)

Never || Less than 1 hour per day || 1 to 2 hours per day || 2 to 3 hours per day || 3 to 4 hours per day || More than 4 hours per day

a) Lectures (listening to presentations by teachers)
b) Learning & discussions with teachers
c) Learning & discussions with peers

d) Researching online (forums, Wikipedia, Facebook, social web)
e) Personal project work
f) Group project work
g) Activities outside of class (visiting museums, making documentary, interviewing people, etc.)
h) Gymnastics
i) Hands-on creative classes - not lectures (art, photography, theater, etc.)
j) Assessment by teachers
k) Personal reflections (personal blog or self-evaluation)
l) Group reflections (inter-vision or group discussions)
m) Doing homework
n) Breaks

8 [M2a] How much time do you want to spend on these learning activities?

I want to spend less time || *Just fine as it is* || *I want to spend more time*

[[same response items]]

9 [M2b] If you and the other students were to rule the school, how would a school day look like? How would you learn? * (open)

10 [M3] For better performance.. (choose appropriate response for each item)

Strongly disagree || *Disagree* || *Neither agree or disagree* || *Agree* || *Strongly agree*

a) I need to be able to build a trustworthy relationship with the teacher
b) I need to be able to build a trustworthy relationship with my peer-students
c) I need to be challenged to participate
d) I need to be able to decide what I want to learn and how I want to learn it
e) I need to work with others
f) I need to be able to express myself in any means (photography, creative design, etc.)
g) The learning must have actual relevance to me
h) I need to work with computers or other electronic devices or social media

11 [M4] Do you like the idea that you will be part of an international project?

Strongly disagree || *Disagree* || *Neither agree or disagree* || *Agree* || *Strongly agree*

Objectives and expectations

12 [OE1] What do you want to achieve in the long term? And what on the short term? * (open)

13 [OE2] How do you think the course or school will help you in that? * (open)

14 [OE3] Do you think you can make a valuable contribution to the course? *

Strongly disagree || *Disagree* || *Neither agree or disagree* || *Agree* || *Strongly agree*

[end of survey]

Post-questionnaire (SQ-2)

In addition to the Background questions (see above questionnaire), the following questions were asked after the pilot.

Involvement and experiences

4 [IE-00c] How would you describe your participation level in this project?

- I was very engaged and motivated to do the project I was very engaged and motivated to do the project
- I was sometimes engaged I was sometimes engaged
- I was not at all engaged I was not at all engaged

Make a comment on your choice here: * (open)

5 [IE-00] On average, how much time did you work at school on your project? *

- Only a few hours per week
- On average about one day per week (8 hours)
- Two days
- Three days or more

Make a comment on your choice here: * (open)

6 [IE-00b] Did you also work on your reAct project outside of school?

- Never
- Happened only once or twice during the whole project
- Once or twice per month
- On average once a week
- Almost every day

Make a comment on your choice here: * (open)

7 [IE-1b] Please describe what you have done and what was the most inspiring. * (open)

8 [IE-1c] What demotivated you or were reasons for you not to participate?

Please choose all that apply:

- ☐ Time schedule
- ☐ Pressure from my peers
- ☐ Bad relation with (one of the) teachers
- ☐ Home situation /problems at home
- ☐ It was too challenging
- ☐ It was not worth it / I don't learn from it
- ☐ Disappointing outcomes
- ☐ Problems using ICT
- ☐ Afraid for negative feedback
- ☐ Other: * (open)

9 [IE-1d] What motivated you to participate? If there are other reasons, please put them in the comment box. *

Please choose all that apply:

- ☐ Inspiration and confidence from/relationship with teachers
- ☐ Inspiration and confidence from/relationship with peers
- ☐ Inspiration and confidence from/relationship with parents or friends
- ☐ Growth of confidence
- ☐ The feeling of being challenged
- ☐ The opportunity to work on a personally relevant project
- ☐ The opportunity to direct one's own learning path and project
- ☐ Ability to express oneself creatively
- ☐ Working in groups (collaboration)
- ☐ Connection with the outside world / International context
- ☐ Working with ICT
- ☐ Other:

10 [IE-2] Do you agree with the following statements in relation to the course (reAct project). (choose appropriate response for each item)

Strongly disagree || *Disagree* || *Neither agree or disagree* || *Agree* || *Strongly agree*

a) I have a trustworthy relationship with the teacher
b) I have a trustworthy relationship with my peer-students
c) In this course, I feel sufficiently challenged
d) I am able to decide what I want to learn and how I want to learn it
e) I work and learn with others
f) I am able to express myself in any means (photography, creative design, etc.)
g) I learn things that are relevant to me
h) I work with computers or other electronic devices or social media

11 [IE-3] How did you experience the international aspect of the course, the ability to communicate and collaborate with people outside of your own country? *

Very negative || *Negative* || *Neutral* || *Positive* || *Very positive*

Make a comment on your choice here: 8 (open)

12 [IE-4] What is your overall experience of the course? (choose appropriate response for each item)

Very negative || *Negative* || *Neutral* || *Positive* || *Very positive*

a) Overall impression
b) Impact on my motivation
c) Impact on the motivation of my teachers
d) Learning to learn more autonomously
e) Learning to collaborate
f) My relation with the teachers involved

13 [IE-5] How does the course influence you: Do you agree with the following statements? (choose appropriate response for each item)

Strongly disagree || *Disagree* || *Neither agree or disagree* || *Agree* || *Strongly agree*

a) The course prepares me well for an internship or job
b) The course improves my capacity to connect and communicate with others
c) The course improves my confidence

14 [IE-6]If you have any additional comments about the course, you can write them here in your own language (anonymously). * (open)

[end of survey]

Appendix IX PARTNER EVALUATION QUESTIONNAIRE

In addition to partner interviews, we collected partner responses using a questionnaire with closed and open questions about each of the work packages. The questionnaire was conducted after the second pilot, in July and August 2012. The closed questions used a 5-Likert agreement scale range from “Not at all” to “Completely agree”. To illustrate the project outcomes with partner reflections, we have included the first three answers on each of the open questions. All partners have responded to the questionnaire.

WP1 Needs analysis

WP1-1 In retrospect I am satisfied with the work that was done in WP1

WP1-2 Please comment on your opinion of WP1¸ outlining aspects that with hindsight you would improve.

> *It could be better to involve the school management in this phase. The management's needs could be a key element for the implementation of the reAct methodology. The prospection was made too soon. The distance in time between the needs analysis and the implementation of the first pilot was too large. Some of the interviewed were not the same. I would suggest a "second" and smaller diagnosis just at the beginning of each pilot. The teacher's role and position as an 'initiator' of change to improve the likelihood of a sustainable development in the context of the institutional framework of school...*

WP2 The REACT Methodology

WP2-1 I am satisfied with the REACT methodology

WP2-2 Please comment on the work done in WP2 and particularly on your view of the REACT methodology

> *The methodology was well defined. It was a very important document both in the teachers training phase and testing phase the reAct approach /methodology is very satisfactory. The principles and the project-based approach are probably two of the main "seeds" reAct will be able to spread afterwards .It seems to be a viable methodology with a relatively low threshold for understanding and participation of people with an educational background. Also quite 'accessible' for the target group of disengaged learners. Some very positive things: the collaborative nature of the development of the methodo...*

WP3 The REACT Tool Collection

WP3-1 I am satisfied with the REACT tool collection

WP3-2 Please comment on the work done in WP3 and paarticularly on your view of the REACT tool collection.

It was a really hard work. The tool was a little bit to difficult to use and both teachers and students were disoriented. The tool work well for people with hight level ICT competencies, but not for beginners.really hard work but a kind of inglorious, perhaps. It's nice to know there is a place where we can find and recommend tools to work with. But it's really difficult to select one without trying some of them first. Too much time-consuming. Teachers and learners avoided its use all the time.The collection as such could have been a more collaborative activity, but the mere existence and mo...

WP4 The 1st Pilot

WP4-1 I was satisfied with the implementation of the 1st pilot

WP4-2 Please comment on the work done in WP4 and especially on the results of Pilot 1, outlining aspects that with hindsight you would improve.

The communication between partners and schools (teachers and students) was not good. The aims were not clear and the process confuse. Despite that, the results of the Pilot was good. The first Pilot was the best. Very motivated teachers (after the teachers training period) and quite motivated learners (first they were surprised but after a while they understood the value of the sharing with european colleagues). What I would improve: a project-based approach with collective purposes could be suggested by teachers from the very beginning (not exclusively individual projects). With the knowledg...

WP5 The 2nd Pilot

WP5-1 I was satisfied with the working process adopted in the preparation of the 2nd pilot

WP5-2 The preparation of Pilot 2 was appropriately managed

WP5-3 My organization contributed appropriately to the preparation of Pilot 2

WP5-4 Please comment on the work done in Pilot 2 and especially on the results of Pilot 2, outlining aspects that with hindsight you would improve.

The Pilot 2 was planned well and the process was more clear and productive. It could be better to organize some specific activities (training, evaluation etc et...) for the teachers. Pilot 2 had too many differences in the different countries. Some countries had the same teachers of Pilot 1, other had some of the same learners. Other had different learners and teachers. Too many different parameters. The preparation tried to attend to all these particularities and was plastic enough even for different schedules. However, the focus was not exactly centered on teachers and stayed on learners, m...

WP6 Quality

WP6-1 The quality processes in the project have been appropriate

WP6-2 Please comment on the work done in WP6, outlining aspects that with hindsight you would improve.

Quality is a very tricky notion and we might have spent more time on this, but again the local variety made this a difficult issue. Dominant in this discussion was the perception of the beholder, which might after all be too biased for a quality judgment. For one thing, the evaluation, the questionnaires, and interviews, have been prepared rather well. With hindsight, I would have improved some questions, and with a stronger focus on open questions and interviews with students. no comments. For us the work done in WP6 was OK, but in hindsight we would have appreciated if the outcomes of WP6 wou...

WP7 Dissemination

WP7-1 I am satisfied with the work done to disseminate the project.

WP7-2 The work package was appropriately managed

WP7-3 My organization contributed appropriately to project dissemination work

WP7-4 Please comment on the work done in WP7, outlining aspects that with hindsight you would improve.

None. Taking more pictures of the activities...We were present locally and internationally, but might have been able to connect more on the national level. On the other hand, it was only after Pilot 1 that something substantial could be shown, so not much time was left and the participants had limited possibilities to connect with 'third parties'. We did some 'manual' dissemination in the Netherlands and tried to follow up the reAct project here and there, but with limited success. A very successful dissemination activity was to involve the Spanish teachers in a project and course in Latin Amer...

WP8 Exploitation

WP8-1 I am satisfied with the work done in the project in relation to exploitation

WP8-2 I am confident that the results of the project will be sustainable.

WP8-3 The work package was appropriately managed

WP8-4 Please comment on the work done in WP8 and in particular on the future of REACT beyond the project lifetime.

It seems that some partners are not interested in the future of reAct project and they have not work so hard in the exploitation activities. Other partners have invested time and resources to implement the reAct methodology beyond the project lifetime. It's difficult to see a future for the reAct project in a world where money rules in the first place and education is seen as a minor political element. However we can make an effort in teachers training. It's a pity there is no "reAct stamp" on it. I am so sorry we didn't implement an European teachers training program. The transition form a pi...

WP9 Project Management

WP9-1 I am satisfied with the way the project has been managed.

WP9-2 I received appropriate support from the coordinators

WP9-3 I am satisfied with the quality of the project deliverables.

WP9-4 Communication processes in the project worked appropriately

WP9-5 Please comment on the management of the project, outlining aspects that with hindsight you would improve.

> *None. Nice work! A very good standard of project management and working ethics. We had a splendid coordination and collaboration. I disliked Basecamp, but the major plus with respect to collaboration were the weekly online meetings, collaborative editing in Google Drive, and Amparo's coordination. The atmosphere in the group was great throughout the project, and I think we really wanted to go the extra mile for each other and for the project. I would go for Asana as a project management environment next time (or the new version of Basecamp - which looks great!). it was very good. Amparo was h...*

REACT Overall

O-1 The project met expectations

0-2 I feel positive about the future of the REACT approach

O-3 The project met its objectives

O-4 Please comment on the REACT project as a whole, and what you have learned from particpating in it.

> *We have learned the great potential of this methodology. The teachers (not students) are the most important element for the implementation of the reAct methodology. Without their collaboration nothing can work properly and the sustainability of the project cannot exist. Then we have to improve the motivation of the teachers first. The reAct project approach/methodology is a gain and has a future if politicians agree to let the teachers implement it. I suggest to work with a teachers training program, officially accepted by politician rulers. I learned how to interact with European partners an...*

Appendix X ALL AGENDAS AND MINUTES

During the entire project, we kept minutes of each of the weekly or bi-weekly meetings. The agenda and minutes of one such meeting is included to illustrate the kind of information it contains. During this meeting, as in most meetings, the discussion addressed local experiences, the planning of next steps, and organizational issues.

Agenda October the 31st, 2011

1. Training 2000
    a. Elmo: Difficulties in using laptops in the classroom. Impossibility of using Facebook at school. Please tell us about the activities in class respect to each one of the eight principles of our methodological approach.
2. News in reAct website.
3. Page or Wiki to show the International and National products (Thieme)
4. Evaluation framework
    a. Semi-structured interview. Proposal in "Evaluation Framework" Google Docs. 4th of November.
    b. Q2 Proposal in "Evaluation Framework" Google Docs. 30th of January
    c. Format for NPRF (National Pilot 1 Report Format) 30th of January
5. International Projects.

Minutes/notes

- Elmo gives update on state with courses
    - Takes a lot of time to get things organized working in the public school system
    - 3 Phases: project 1 familiarization (topics not included in the curricula)
    - Link with the 8 didactical principles
    - Reporting obligations for teachers in line with the existing school program
    - Project 1 part time, but project 2 & 3 full integration
    - Remark of Nick on Transversal skills opportunity (skills like learning to learn)
    - Elmo: We did connect to Facebook, do projects, etc.
- Evaluate the situation in Italy as an example of how it might be for lot of teachers being faced with formal requirements like reporting.
- Situation in Spain: worked on getting Internet in the classroom. everybody knows this is a pilot.
- Situation Portugal: context related to the situation in Italy but adult learners.
- Nick: a key objective of the project is to explore how to implement react is different contexts.
- Use cases from all countries to develop a case base that can be used in similar or different situations. So evaluation should take the context into consideration.

- Austria: exams in 3 weeks (frustration about the international project …., delays, re vote). Students will have the opportunity to do their projects though.

React website

- Problems to 'translate'. There is a handbook that clarifies how to do it or contact

Evaluation tools

- deadline 4 Nov - will upload the materials in Google docs
- semi-structured interview for pupils (preferably recorded on Video, national languages), individual interviews. Ana … easier to interview in groups, both individual and in groups ….or done by students
- at the end of project 1 is Q1, at the end of project 2 and 3 - interview, Q2 at the end of the whole project.

Overview of projects

- there is a document, but Thieme does not know what is happening. Just a list is not sufficient.
- we need a document on face-book so students and teachers can figure out what is happening. The document is in face book and links will be added by the 'owners' and student can use it to their project purposes.
- the discussion shows that 'someone' need to focus on this issue to clarify and make it work. The one person should 'clarify how it works' and guide the others to make their contribution.
- = Anabela will describe the procedure and store it in Basecamp to be used by everybody.

Appendix XI TEACHER TRAINING MANUAL (SPAIN)

Each of the partners was responsible for creating and preparing a teacher training for the local pilots. Below, the teacher-training from the Spain pilots is included.

Teacher Training Program

Workshop title: *"ReAct approach. Autonomy, creativity and collaboration in the classroom supported by ICT"*

To implement the reAct methodological approach it is necessary to transmit to teachers how important it is that policy makers know about the results of reAct project and allow flexible curriculums with flexible assessment procedures for the students.

The Management role should be to recognize, value and spread the teachers' innovation in ICT and also plan a series of actions needed for teacher training in ICT integration.

GENERAL OBJECTIVES:

- Motivate and engage teachers in reAct methodological approach;
- Familiarize them with tools and their pedagogical uses;
- Provide strategies to be a good "coach".

SPECIFIC OBJECTIVES:

- Pedagogical knowledge (abstract of the approach was included);
- Training in ICT (using the tool collection);
- Preparing the 3 first months of the course (including Familiarization, International Project, Local Project, and Integration).

AIMED AT:

Teachers interested in learning innovative educational strategies to improve learning motivation through the use of web 2.0 ICT tools by the students.

TEACHER TRAINING PRINCIPLES:

Applying the reAct methodological approach during this workshop, the teachers will experiment the same methodological approach that will be applied with the students.

KEY PRINCIPLE 1: LEARNING BY EXPERIENCE

Developing activities that promote autonomy, creativity and collaboration among participants, experiencing the same pedagogical approach that would apply to students. That is, the structure of activity during the workshop will consist mainly of reflection periods interspersed with collaborative activities (*) by participants. Presentation-style instruction will be avoided.

** Examples: Understanding a tool in 30 minutes, autonomously / Prepare a short presentation on a topic of choice / design a classroom activity / Debates about school problems / Make a mini-project in collaboration.*

KEY PRINCIPLE 2: INFRASTRUCTURE

Each teacher will have access to a computer in the classroom, with free Internet access, and support will be given to teachers who do not have the necessary experience (see eligibility criteria).

KEY 3: TRAINER/TRAINER

Reflective activities with the teacher, who, through role-playing or discussing scenarios, prepares for envisioned difficulties and challenges. With a specific focus on using ICT.

KEY PRINCIPLE 4: DIALOGUE ENVIRONMENT

It is necessary to explore and comment, through reflection, all the reluctance and resistance that may emerge. A spirit of dialogue, supported by evidence and other voices (experiences and case studies of the use of this methodology, sample projects, communication, videos etc.), Must be a way to show the participants which are the advantages of the approach. Rather than expose, the trainer must listen and show, and give "wings" to the participating teachers, acting as guide and counselor.

KEY PRINCIPLE 5: ATTITUDES

Do not avoid the need to explore the attitudes of the participants, how they understand their teaching, which problems and obstacles they find in their work, how to they solve it now, which level of autonomy they have, etc. This is key, if the teachers attitudes are oriented to change and innovation, it is not difficult to accept this teaching model.

i. Option A: face-to-face classroom sessions, with enough time for exploring tools at home.
ii. Option B: blended learning: Initial classroom training sessions and on line sessions using web 2.0 tools for communication and collaboration. 2 initial classroom sessions + online sessions + 1 final classroom session

DURATION - 35 hours

PROGRAM: Part 1. Understanding (5 hours)

- The role of ICT in education and training process
- ICT in a traditional classroom
- ICT in a collaborative, creative and autonomous classroom (web 2.0) reAct methodology (7 principles)
- Listening to the teachers (needs, hopes, fears, views)
- Listening to students interests, coaching strategies
- Feel confident about sharing (digital identity, copyleft, Creative Commons)

- Create digital profiles (if necessary) and contact with other teachers involved (optional, access to Facebook reAct Group)

PROGRAM: Part 2 . Exploring (20 hours)

- Create accounts in different web 2.0 tools + Install Google toolbar (translator) Activities to explore Google Set (G. Docs, Groups, Sites, Gmail, Translator...)
- Activities with web 2.0 communication tools (Google +, Facebook,...)
- Using Diigo (The tool collection) https://groups.diigo.com/group/react-project
- Activities discovering pedagogical uses about different ICT tools (TOOLSET):
  - Profiling: (Facebook, YouTube, 43things.com,...)
  - Storytelling: (toondoo, storybird, bubble project..)
  - On line Games: (Farmville, enercities, mathgarden,..)
  - Creative tool Studio: (Flickr, picnik, glogster, toondoo,...)
  - Research & Learning: (Zooniverse, Smithsonianeducation, Prezi, Slideshare)
- The e-portfolio and PLE.

PROGRAMME: Part 3. Implementing (10 hours)

Work in groups a detailed program of the 3 first months of a course (including FAM., INT. PROJECTS, LOCAL PROJECTS and/or INTEGRATION).

Appendix XII INTERNATIONAL PROJECT PROTOCOL

Based on a desire to address 'Learning to Live Together', an international component was introduced into the reAct project. Students were supposed to work together on projects, and we provided the following supporting guidelines to facilitate this process.

WEEK 1 – Selecting projects and groups

Activity 1: Each country had to upload a participants-list in Facebook reAct International, using the 'Document' functionality. The description had to include the school, course name, country, students' and teachers' names and their Facebook nicknames and countries.

Activity 2: Post project proposals, including: Country / Project name / Short description and main ideas. Each country had to upload one or more posts with basic information about the project/s suggested (example below).

Figure 43 - Example project proposal on Facebook

Activity 3: Build up groups, using the 'Vote' functionality in Facebook. A project list was maintained and students were asked to indicate which project they had submitted or wanted to participate in (see example below).

Figure 44 - Facebook Project List

Activity 4: Volunteer representative: students and teachers had to decide about who wanted to represent the group, and discuss that under the project proposal.

Students were asked to 'convince' other students who could share their support and appreciation for someone using the 'Like' button. The representative was supposed to coordinate the group and link to the final project.

Activity 5: Finally, another document had to be uploaded when groups were established, containing a group participants-list (student name, Facebook nickname, country).

WEEKS 2 & 3 – Working on International Projects

Activity 1: Select communication tools to be used, creation tools, and project objectives, roles and responsibilities.

Activity 2: Project management and planning, research, create project, prepare presentation.

WEEK 4 – Presenting the projects

Activity 1: Elaborate on the final product

Activity 2: Post product in Facebook reAct-International

Activity 3: Cheer and comment on the projects

Appendix XIII Online Tool to Facilitate Self-guided Learning Projects

During implementation and analysis of the reAct project, a clear need for better support for the project-based learning approach was identified. The inherent impossibility of teachers to provide expert knowledge on a wide range of chosen topics indicated an opportunity for networked learning. Experiences during the international project phases showed that this was difficult to organize, and only highly structured collaborations resulted in meaningful outcomes for all participants. Several relevant and interesting online 'how-to' guides and 'make' websites that were included in the reAct toolbox were not used either, due to a language barrier, but mostly due to the lack of human interaction and personalized support. Therefore, we started thinking about a possible online environment to better facilitate the kind of learning processes facilitated by the reAct project. Among other things, we did a market analysis, developed a concept, and presented our ideas at startup events, talked with educators to validate the concept, and prepared mockups and visualizations. Because we were unable to find funding, the concept was never realized. However, as an illustration of a practical idea that emerged from our research, we include a summary of our market analysis and a mockup of the teacher dashboard below.

Market analysis

During reAct, we asked students: what would you like to do, make, and learn? And we asked teachers to facilitate these student projects, which had the following stages:

1. Exploring possibilities → **Easy** (Google, Pinterest, etc.)
2. Getting prepared (overview of steps ahead, preparing tools and resources, setting objectives) → **Difficult** for teachers, but blogs and websites like Instructables, DIY.org, and YouTube often offered high-quality guides and explanations.
3. Do research/make stuff and receive feedback and praise, ask questions about topic → **Nearly impossible**: teachers were no experts in any of the chosen domains, did not have insight into progress, and were unable to provide effective feedback.

If a teacher wants to support this process (*interest-based project-based learning*), (s)he needs at least some **knowledge about the (interest) domain** and relevant workflows and tools, and (ii) being **up-to-date on progress** (of student, learner, employee). This was problematic, because the teacher/mentor is unable know about all topics or relevant tools, and did not have much insight into progress of students.

The goal, therefore, was to provide a learning environment that *matches* learners with specific interests and domain experts and *facilitates* project-based learning: an open online infrastructure to facilitate anyone to start and complete projects of interest, e.g. building a weather balloon, your dream house, develop an iPhone application, making a dinner for your parents, build a robot, make your own musical composition, or writing your thesis. The environment should, therefore, support experts to generate structured expert content in a pedagogically sound manner, offer opportunities for interaction and share expertise, insights for all participants, and facilitate project work. With these criteria in mind, we made a categorization of existing tools and websites, as depicted below.

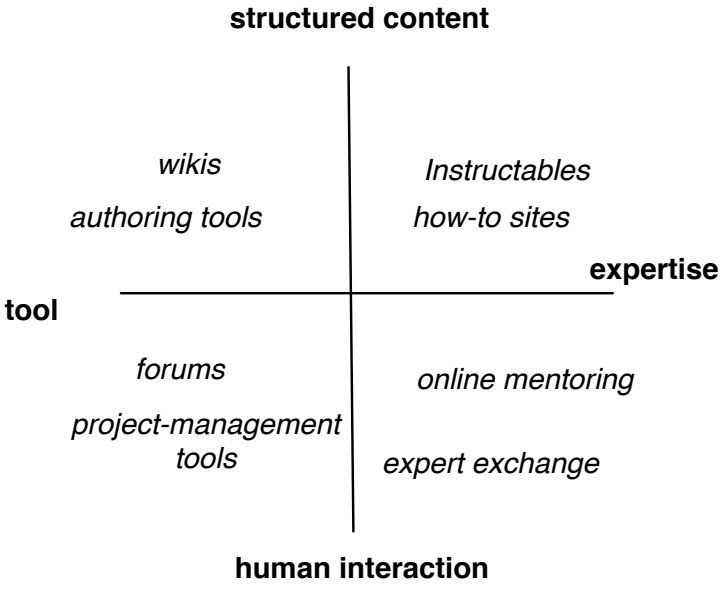

Figure 45 – Market Analysis for 'reAct project tool'

The table below offers further specification of the variety of apps and tools available and their main focus or strengths. As can be seen, we have included a 'monetization' criterion, as we expected that involvement of external experts should be, at least partially, driven by monetary incentives. Such an online tool would only work when there is a critical mass of high-quality expert content and people.

Table 40 – Market Analysis for 'reAct project tool'

What?	Why?	How?	Similar to
Diversity	Allow for exploration and choice	Upload/create guides	DIY.org, Skillshare, Instructables, MakeProjects
Project-based	Effective and engaging pedagogical approach	Project guides	idem
Peer and expert feedback	Both are needed for motivation and learning	Features for progress, interaction and feedback	Khan Academy, Goalbookapp, P2PU.org, OpenStudy

What?	Why?	How?	Similar to
Monetization	Motivate experts and companies to create high-quality guides and offer personal feedback	Market place and other revenue streams	Skillshare, Udemy
No single institutional/organizational focus	There is value in connecting the educational and professional/freelance world and the open Internet	Match-making, educational programs/discounts, assessment	DIY.org, Instructables, MakeProjects, OpenStudy

Mockup

Finally, to illustrate how such an online tool could look like, we prepared several mockups. A screenshot of the teacher dashboard is included in the illustration below. The teacher can view progress and participation of all his/her students in the different cohorts, and the projects they are involved in; in this picture, the teacher is looking at the five projects that are done by students from cohort 3C. The teacher is not responsible for the content, as this is facilitated by the platform. Rather, he/she can nudge students to make progress and interact with individual students who appear to be stuck.

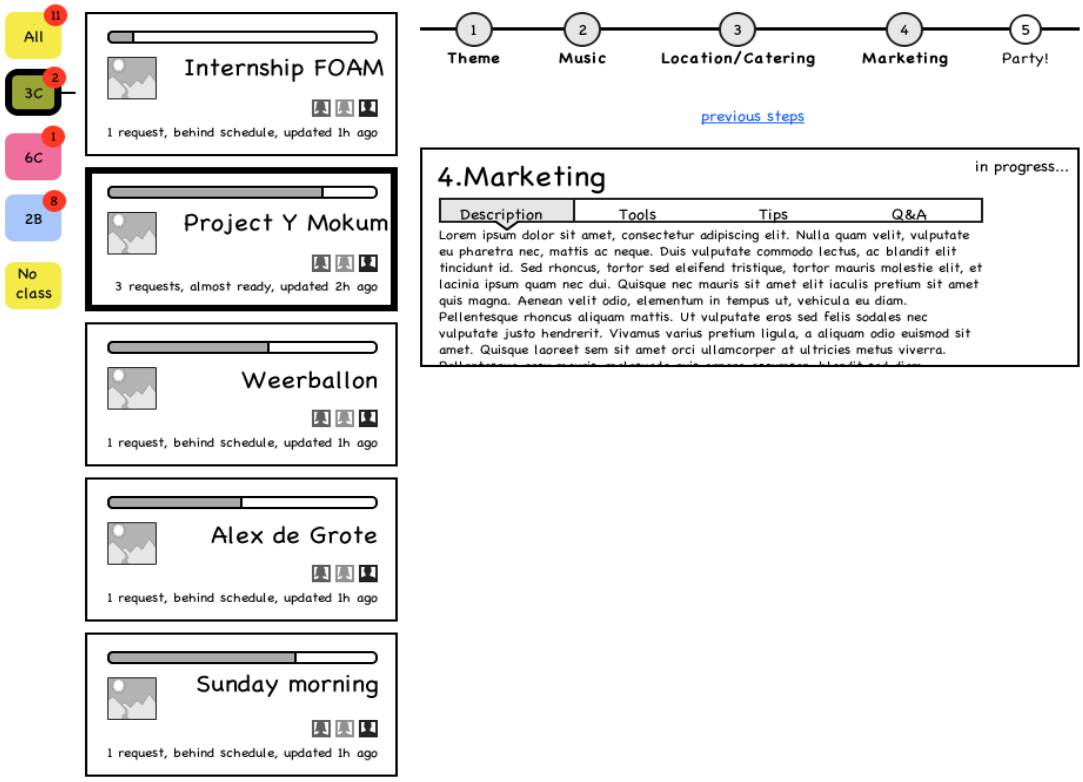

Figure 46 – Mockup of 'reAct project tool': teacher dashboard