CREATION AND TRANSMISSION OF SOCIO-ENVIRONMENTAL VALUES THROUGH THE PRODUCTION OF DOCUMENTARIES IN SECONDARY EDUCATION

N. Álvaro[1], A. García-García[1], J.J. Asensi[2], V. Gavidia[1]

[1] Dpto. Didáctica CC. Experimentales y Sociales. Universidad de Valencia (SPAIN)
[2] Instituto de Enseñanza Secundaria "Sorolla" (SPAIN)

Abstract

In this project we have design a proposal to wake up and enhance an environmental conscience in 2nd ESO - 13-14 years - students. We have considered the official syllabus, an active and constructivistic methodology following Environmental Education principles and made our students work cooperatively. Our participants should find and transmit environmental values and attitudes by producing a documentary. Documentaries can be used for broadcasting ideas or problems, but is the documentary the right channel to transmit values and attitudes? And, is it necessary to spread the environmental problems?

Keywords: Innovation, documentary, environmental education, transmission of values and environmental attitudes, natural science.

1 CURRENT SOCIAL PROBLEMS ASSOCIATED WITH ENVIRONMENTAL DAMAGES

Along the history, the perception that humankind had from its relation with nature has been quite different. The old conception of mankind and nature as two separate entities, unfortunately still present in our society, forgets that human beings and nature cannot be split in two.

The exponential growth of human population and the growth of our consumer society are causing most of our environmental problems, like overexploitation of renewable resources, the loss of biodiversity, the pollution, the climate change, the overpopulation and, together with other social tensions, the poverty. Such evident relation is hard to deny, moreover if the take into account the scientific researches.

It is very difficult to built up a complete model of our world, as we tend to separate it into different objects of study classified according to their characteristics and inner conditions, so that it is easy to arrive to such point that we forget the initial purpose: a global study of our entire world. Such model, representing our reality, can only be achieved through complexity, and has to include most of the interactions that really happen, a great number of them having us, the humans, as an active partner. In fact, problems raise when there is an imbalance, which multiplies its negative effects and concerns other components of our society. If not solved, the whole humankind can be affected. If we continue with an uncontrolled development, in which nature is just another resource to be exploted, if we still remain undervaluing nature as part of us and loosing the close relationship that we had in ancient times, we will keep ourselves in the biggest mistake mankind has ever commited.

A complex reality means complex solutions, so environmental problems need of multiple and complex solutions, to be conducted in many different areas and at very different scales. It is necessary to return again to the idea that the humans are integrated in nature and, as part of it, there are numerous mutual relationships whose disturbance affect both sides, nature and us. These change to a long term coexistence throughout time is, namely, the sustainable development.

1.1 Next step: sustainability

Sustainable development is defined as "*satisfying the needs of the present generation without compromising the aptitude of the future generations to satisfy their own ones*" [1]. It suposes a development that integrates all three dimensions, social, economical and the environmental, as anyone can be fully understand without the other two ones. It implies a society awared of that the unique viable development is that one that provides propper answers to the complexity of our system and, if such system is complex, you can only expect that it will be difficult to apply such solution. You

require citizens conscious of the need of such development and capable of admitting that otherwise they will face very negative effects at any level, social, economical and environmental. Although increasing constantly, such awareness is still not common enough, as it is based on consequences that do not have a nearby implication, but in the long term, when actual behaviours or decisions will hinder the life of these future generations.

1.2   An impulse from the school

Sustainable development is a goal of the Environmental Education (from now on, EE) also known as Education for Sustainability. This education is understood as a constant process that puts emphasis in the conscience and that is based on a knowledge of the reality beyond the mere purpose of reporting. It needs a critical review of our current values together with an enhacement in our demand of change. It requires first a recognition on the existance of environmental problems prior to walk towards their prevention and solution, which will only be applied if we accept its importance. If our target is a sustainable development, EE must cover more than one area. It has to be multi- and interdisciplinary, and approached from different elements of our social system. One of them, naturally, is the school.

At school students built up their own learning by confronting quite different inputs, among others, school organization, teachers and their values, family, friends and other students or social media. A quite complex *patchwork* of information that has to be processed and that will contribute to their education.

As already mentioned, the environmental worsening is a consequence of our actions. Each of us is responsible for the regeneration and protection of our environment, and such responsibility presents new moral and intellectual challenges like how to clean up our planet or who has to decide and develop the solutions? Education surpasses the passive transmission of knowledge, towards a transmission of values, attitudes and ways of acting. Education links and culture, morals and behaviour and allows "t*o wake up in the human being his capacity to create and generate a new natural and social order* " [2]. Through education the new generations assimilate and learn the knowledge, manners of being and ways of seeing the world of previous generations and, after assimilated, they contribute to develop own personal rules of conduct. Such consequence is relevant, as we live in a society, and living together means to adopt and respect rules and laws. Therefore education is a process of formal socialization of individuals and an essential tool for preventing and avoiding social problems. If we focus the education on environmental protection, it will conduct to the adoption of decisions that will improve the actual situation of our planet and prevent them in future. If we need persons committed with environmental protection and sustainable development, EE is, at the same time, our target and our success.

Formal education includes usually EE themes, at least in the developed countries. It is considered as transversal, meaning that its teaching and learning can be conducted in mostly every subject. It constitutes a bridge between school and nature, allowing to bring to the classrooms the socio-environmental concerns, problems and conflicts of the real world so that they can be discussed and approached critically " [3]. But our objective has to cover a wider social segment as it includes important attitudinal improvements.

An education focused on sustainability can cover those remarkable lacks of our learners in knowledge, values, attitudes and aptitudes related with the environment and can help them to find solutions to the current problems of our society. If we make them also spread their knowledge to other students, we establish a peer education, a real learning line working for the environment. We shall not only forward knowledge or develop attitudes, but also guarantee that all this is widely broadcasted.

2   A PROPER METHODOLOGY FOR DEVELOPING THE ENVIRONMENTAL EDUCATION

2.1   The axiological dimension and its value for learning

If we want the way we act, we have to move beyond the mere information transmission, as the solution to an environmental problem will not be never easy, neither quick. The solutions require deep social changes that can be only achieved after a even deeper change in current attitudes and behaviors.

An attitude includes three fundamental aspects: cognitive (information about the object / subject in question), affective (feelings towards the object / subject and their valuation) and behavioural (trend to act) [4].

If the attitude can be learned it means that it can also be taught but it is necessary to remember that due to its affective dimension, its change will need a social contribution of beliefs and values, which can be obtained both in informal and formal contexts. In our case, the guidelines are [4]:

- To increase the information about environmental problems
- To improve the personal resistance against the social pressure
- To develop skills for choosing the right decisions

We have to keep always in mind that creating attitudes does not necessarily generate new behaviours, since there is no direct relation of cause and effect between both. Nevertheless, changing attitudes is basical for former changes in behaviours.

2.2   Constructivism in action

We consider that a constructive methodology is the right one for improving EE, by granting importance to the context besides the knowledge, again the idea of complexity. It is essential in our pupils to built a link with the object of knowledge and the relevancy of the comprehension of reality, as studies affirm " the knowledge is not the result of a mere copy of the reality, but of a dynamic and interactive process across which the information is interpreted and reinterpreted " [5].

This methodology provides our learners with personal tools that allow them to solve problems by creating their own procedures to obtain their knowledge. Learning turns into a dynamic process where ideas appear and are modified causing the raise of new ideas and students participate and interact actively with their education. It also approaches them to reality, basic for an education orientated to action. And since without action there is no social change and without social change there is no solution to the current problems, such approach is fundamental for our purposes.

2.3   Cooperative learning

In the cooperative work, the goal of a pupil can only be achieved if his companions do so. After Piaget [6], "*cooperation allows the development of an autonomous morals since it is based in mutual respect and equality*". When working cooperatively they develop feelings of belonging, acceptance and support inside the group. It allows the internalization of values and attitudes, the development of a critical sense, a social sensibility and of a personal autonomy, promoting remarkable moral values for the social harmony. As cooperation favors the well-being of learners, this method is also legitimated by the emotional education [7].

Cooperative learning and group work are quite different, the first one looking for the improvement of all the members of the group, whereas the second one focuses in the final work to be produced. Through cooperation a student becomes responsible for the task that he has asssumed and also helps other group members, since their work impacts in his own learning. Cooperative learning increases mutual interest, improves the levels of performance and increases the self-esteem. In addition, it contributes to the acceptation and integration of low-performers while increases the enjoyment for learning.

2.4   The influence of mass media and the use of the new technologies

Mass media have turned into something fundamental into the current life. Just take into account the time that we devote them and their great expansion thanks to the new technologies. In fact, they clearly compete with other social agents like the school or the family. We can neither avoid nor isolate them. Moreover, we can use them in education.

The mass media help to structure our society by putting in contact individuals with its main issues. Their influence, by changing the quantity and the quality of information, can alter our social life and foster its change. Its integration in school turns out to be fundamental if we want to influence the students, by exploiting its beneficial effects and adapting us to this new reality. In the school, It means that [8]:

- they provide a comfortable and attractive access to information and to the most effective knowledge,

- they offer models of behavior different from those in school, more attractive and seducing.

In school context, given the plurality of information, critical reading is essential to facilitate the autonomy of the students and to help them to develop their intellectual skills. In addition, to know how to manage and use the technologies involved in communication improves their insertion in our consumer society.

3 PROPOSAL OF EDUCATIONAL INTERVENTION

Our proposal tries to foster personal and social changes in favour of the sustainable development following the next EE principles [3]:

- To favor the knowledge of environmental problems, both local and global
- To qualify persons to analyze critically environmental information
- To facilitate the comprehension of the environmental processes in connection with social, economic and cultural ones
- To favor the acquisition of new pro-environmental values and to promote critical and constructive attitudes
- To support the development of an ethics that promotes the protection of the environment from a perspective of equity and solidarity
- To foster people to analyze socio-environmental conflicts, discuss about them and decide the different solutions
- To enhance an active participation in social matters, promoting a shared responsibility towards the environment
- To be an instrument that favors sustainable ways of life

Summarizing, the key points that guide our tasks in the class are:

- To analyze environmental information and to reflect on it
- To promote critical, solidary and constructive attitudes
- To bring out some anthropogenic problems and to foster pupils to search for solutions that protect our environment
- To approach students to nature
- To aid the transmission of knowledge and the raise of environmental values between students of different educational level

The main key point is the record of a documentary by students of 2nd ESO, which will later be used by themselves to teach 1st ESO fellows. The innovation lies in our students both emitting and receiving environmental messages.

We took advantage of a one-day didactic visit to the zoological garden Bioparc, in Valencia. This park follows the so called zoo-immersion rules, trying to avoid the optical and physical barriers, although existing, so that visitors feel quite close to animals. Therefore, our students could act as nature reporters located in Africa. They had also to observe and compare characteristics of different animals, to describe the related adaptations and to fill a questionnaire. Our class was divided in three heterogeneous groups, each one dealing with one Class of Vertebrates: Amphibians, Reptiles and Mammals. Each group had to study two different animals prior to the visit, finding out information on their main characteristics, curiosities and concerns. Then, they had to write the script of their documentary, which would be recorded during the visit to Bioparc. They also had to remark the main characteristics of each Class of Vertebrates. The documentary was shown to all 1st ESO groups, four in total, and the authors answered their questions.

3.1 The guidelines of our intervention

The guidelines of our experience were: the acquisition of information about the animals to be studied (cognitive), direct observation of them in Bioparc (affective), the production of a documentaries (procedures), and the need to spread the obtained information (conative). Together with the cognition

and procedures, observing and recording the animals made the students empathize with them, while the documentary extended these effects from themselves to their schoolmates.

To make this learning significant, contents were explained through the answers that the same pupils were giving to our questions. We also used daily life examples and open questions, and their autonomous work narrowed the distance between them and the studied problems, all that in order to wake up in our learners the idea of complexity.

Cooperative work promotes social values and contributes to increase their encouragement and responsibility. We decided that cooperative groups should be heterogeneous to favor the social integration of the most low-performing students. When transmitting information, a proper channel can improve its effects, while a wrong one can weaken them. Traditionally, documentaries have transmitted environmental concerns, but our students are now so used to them, that they have lost part of this effect. Making them authors of the documentary, allowing them to design and participate actively in its production and, at at the end, showing it to their peers has transformed their learning in significant learning. In addition, we considered important using IC technologies. The documentary turned into a manageable challenge that would let them adquire the next competences (Fig. 1):

Fig 1. Competences developed through the production of a documentary

Competence in linguistic communication	To transmit verbally scientific knowledge through the production of documentaries
	To use different templates
	To be able to speak in public
	To use forms of expression from the mass media
	To use properly specific terms
	To discuss and dialogue within a work group
	To enhance arguing skills
	To respect the right to speak
Competence in the knowledge and interaction with the physical and natural world	To reach a global vision about the knowledge of the environmental relations
	To relate mass media and diffusion of knowledge and its social applicability
	To understand the importance of knowledge and its diffusion for the wellness of our society
	To promote students to participate actively in the socio-environmental problems
Digital Competence and treatment of information	To search in the Internet information about the characteristics, curiosities and problems of certain groups of Vertebrates
	To be able to select trustworthy information
	To use didactically a documentary at school
	To use correctly video recorders, cameras and video and image edition software
Social and civic competence	To understand the common opinions in our society on the environmental problems
	To recognize the social role of the scientific knowledge
	To promote society more involved in the diffusion of information
	To get a more integrated global environmental vision
Cultural and artistic competence	To know about animals of different biomas and to be able to recognize them in images and drawings
	To identify forms of expression from the mass media and to be able to reproduce them
	To enhance their knowledge over Vertebrates and their relation with humankind

	To acquire autonomous learning
Competence in learning through life	To extract real facts from news
	To extract conclusions from their work
	To organize and to integrate the acquired concepts for their later transmission
	To search information by it self
Autonomy and personal initiative	To take initiative in acts with the purpose of communicating knowledge
	To improve reasoning skills and the critical and autonomous thinking
	To arrive to conclusions through critical and autonomous thinking
	To be able to discuss peer's arguments

4   PHASES OF THE EXPERIENCE

The experience was splitted in next three phases.

4.1   Phase of contextualization

In this phase we justified our proposal to our students and put it in context, that's it, why they had to produce a documentary. Guided by us, learners deduced the need for transmitting information inside our society, decided the best way to do it and reflected over its own role in this project.

4.2   Phase of production of the documentary

In this phase students searched for information, configured the script of the documentary and designed the storyboard in Bioparc. The research allowed each group to collect characteristics, curiosities and problems of their groups of Vertebrates. Students approached knowledge of the animal (characteristics), developed empathy (curiosities) and got involved in the consequences of our actions (problems). In order to avoid a passive attitude we requested them also to reflect on those problems and asked them to propose a solution.

With the compiled information, groups elaborated the script of their documentary, which should guide them through the whole production process. Scripts stated also who had to explain which content, their order of appearance, the place and angle of recording and the materials to be used.

The documentaries were recorded in Bioparc and completed in the school. They used a video recorder provided by the school, although they could use their own cameras if they wanted. Recording was amusing while learning how to use technological devices. The documentaries can be viewed in the next link:

https://drive.google.com/folderview?id=0ByQ_tmDT0uxLfnZmWUhwWGRfZUVtbnZGbkhKQWdSNk81 VIVGR0ZWZVJYZklVTFF0NjU3dXc&usp=sharing

4.3   Phase of diffusion of the documentaries

Once elaborated, the documentaries were shown to the four groups of 1st ESO that were studying at that moment the Five Kingdoms, the different groups of living beings. During and after the documentary, they had to fill in a table the main characteristics of the animals, a knowledge demanded in their syllabus. At the end, they had the opportunity to place questions or doubts to the authors, which also explained why and how they had produced such documentaries. Finally, they assessed the work of their 2nd ESO fellows, using a template that had been formerly discussed and agreed by teachers and students.

5   RESULTS AND ASSESMENT

We used different tools for assesing the student's performances. Among others, we analyzed the class dynamics and checked their knowledge, values and attitudes. We used a questionnaire that included sixteen questions, with either an open answer or a Lickert five points scale. Data were processed with SPSS statistical program. In general we could observe an increase in the academic results.

Among the positive results collected through observation and evaluation we would like to emphasize three major aspects. Regarding the used methodology, it is necessary to highlight the attitude of our students, who worked effectively and took active part in all activities, what favored dynamic and participative sessions, as constructivism demands.

If we consider the cooperative work, we can outline a progressive and positive change in their attitude towards their companions and towards the organization and coordination inside the work group. Dialog and companionship was common, and tasks were delivered in time. At the beginning they requested external help, soon became more autonomous, especially after recording the documentaries. Low-performers were quickly integrated and all showed values like solidarity, responsibility, companionship, respect or cooperation.

Last remark concerns to the product they delivered the documentary. Pupils showed great skills when using IC technologies and recording devices. Even a group decided to record and edit their video by their own. If our 2nd of ESO students were quite excited with our project, their fellows of 1st ESO were even more interested in a video designed, recorded and edited by their companions. The data confirm this interest, but also our observation on their behaviour during the screening.

Next figures show the data that, after our opinion, are more interesting. Each set includes a graphic and an explanation. In total we collected nineteen questionaries.

What they enjoyed more was working in group and recording animals live. (Fig. 2).
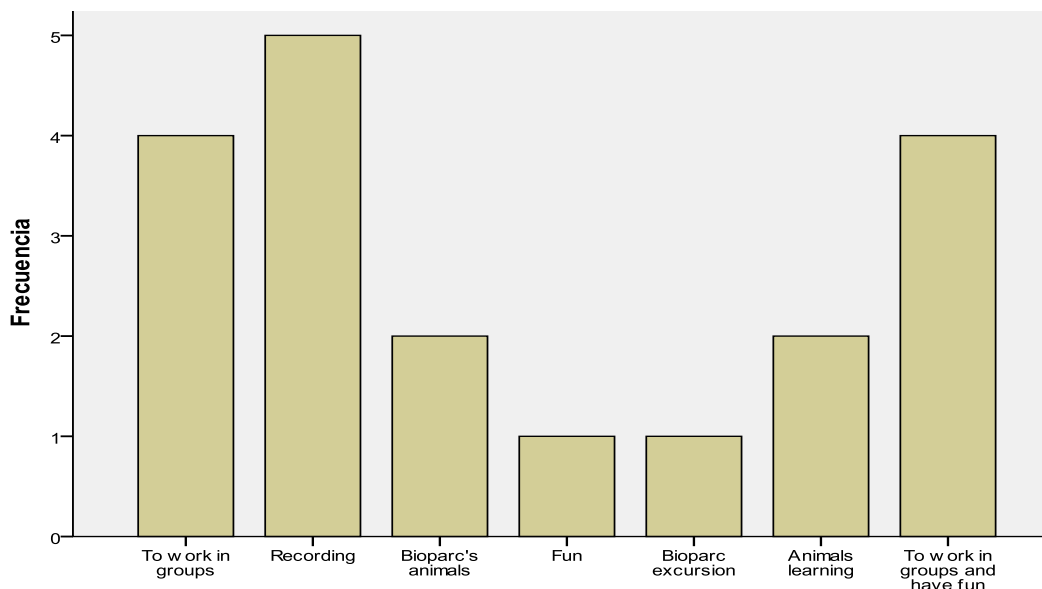

Fig. 2: "What I enjoyed more during the production of the documentary was ..."

They admitted that they have studied the characteristics, curiosities and problems of the animals through his group work but also through the work of other groups. They also consider that learning first about an animal increases their interest and attention when observing them in Bioparc (Fig.3).
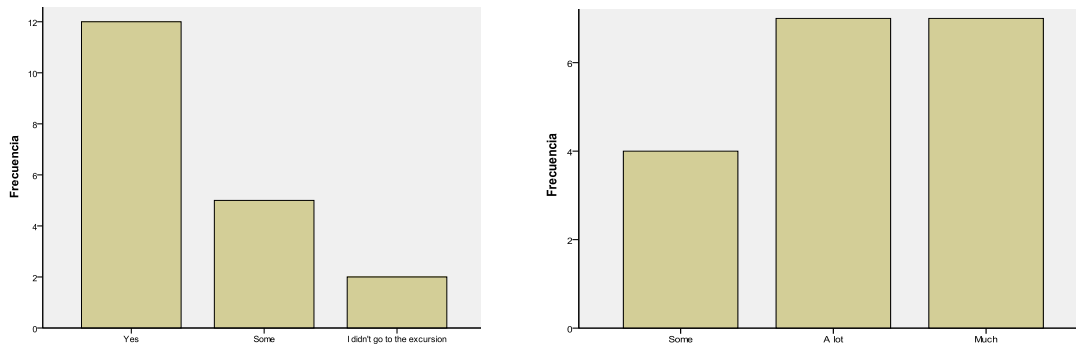
Fig. 3: The observation of the animals
Left: "Were you able to observe in the animals some of the data that you had collected at school?"
Right: "Having studied first their characteristics, increased your interest in observing the animals?"

When considering the importance of diffusion, a prominent majority highlighted its utility (fig.4), most of them affirming that the whole world should know these information. But, unfortunately, a high percentage of learners can not provide arguments towards this consideration, even several of them consider important to pass the subject.
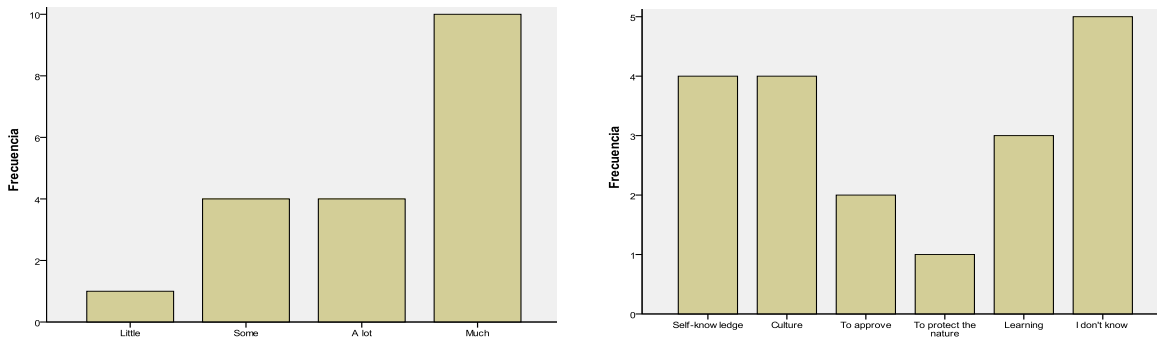

Fig. 4: The importance of diffusion
Left: " I think that it is useful the diffusion of what we learned in these project ".
Right: " Why is important our documentary?"

The best results appeared when analyzing the methodology. A majority of students considered that learning is enhanced when working in group, in lessons that promote dialogue and participation. They also recognize that by producing a documentary, they have learned more on the animals that with conventional lessons, and consequently they would recommend it to other teachers (fig.5). Also, they though that they were closer to nature and its protection after the experience.

They think that the principal contribution of their documentary was to learn about the animals. Its cultural function was named by only a minor percentage. At a personal level, the main effects of participating in this project were learning to work in a group, to discover new curiosities of the animals and to reduce their shame to speak in public, one of the common fears of them. Another time, when answering which was the main reason for recording the documentary, approximately half of them answered again "to pass the subject", while the other major reasons was their education.
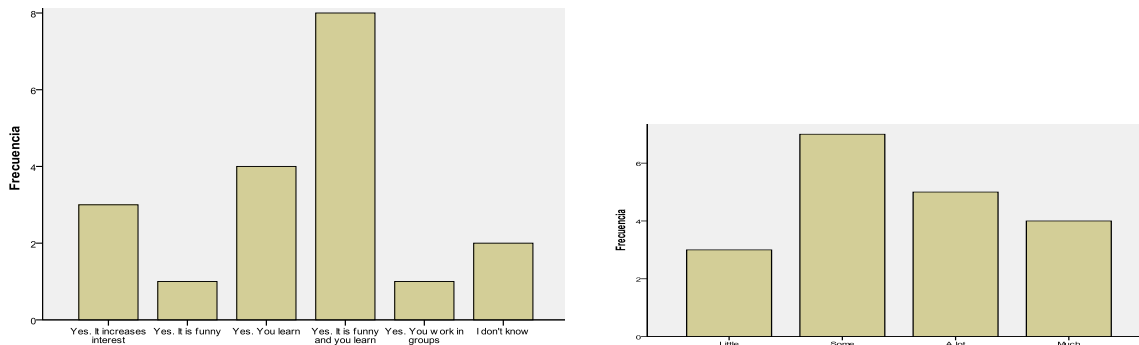
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Fig. 5: Effects of the documentary
Left: "Would you recommend other teachers to produce a documentary in their classes?" Right, "After the experience, do I feel myself closer to nature?"

During the experience, we could hear several times our students arguing that this type of work was much better than studying, even that during their work that had been "in a lesson". For them studying does not include learning new skills, discussing, finding information, recording, explaining, helping other fellows or finding solutions to problems, which is an exact description of the main problem in education.

6 CONCLUSIONS

Our students, with their documentaries, have carried out a significant learning through cooperative work, they are awared of the importance of learning by their own, they can highlight their personal contribution to a common work and they recognize the role of information and its diffusion in our society. They have enhanced their autonomy and responsibility and they have applied IC technologies to the learning of natural sciences. They recognize the importance of discussing and participating, all that with great amusement, as they recognize, during the preparation and, especially, when recording with the animals. Their learning has spread to other educational levels, in this case to students of 1stESO, who not only were attentive to the documentaries, but also took part in their assessment. Our proposal is endorsed by constructivism that grants a central role in education to learners and their participation.

Great part of our students has been conscious of the importance of the transmission of information. They have develop a bigger empathy with the animals of study, but the need to improve the environmental conditions is still not enough internalized in the pupils, as behaviours and attitudes need a constant effort during a longer period. Nevertheless, we can conclude that we have found a proper way to do it and, although they still think that one of the major reasons for producing the documentary are to "pass the subject with good marks", sooner or later they will recognize the real aim of these experience.

We feel satisfied, as we have brought our learners closer to nature and its problems, we have made them participate in the diffusion of ideas, they have develop a personal commitment in a work that surpasses the classroom and that gives the sense to the study of natural sciences. All this supposes a positive necessary change in favour of the sustainable development.

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