

FIT FORTHEM

Recommendations for institutional change

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1. INTRODUCTION

The FIT FORTHEM project, funded under Horizon 2020, aimed to transform the FORTHEM Alliance into a cohesive European University with a robust higher education and research strategy. It analyzed the unique characteristics of each of the 7 founding members, tailoring support actions to specific needs and fostering knowledge circulation.

One of the FIT FORTHEM teams focused on developing a common strategic research and innovation agenda. Methodology to do so involved a SWOT analysis, identification of good practices, and a comprehensive survey involving 2,472 respondents across the alliance. Their reports, eight in total, summarized recommendations for enhancing internationalization, open science, human resources, transfer and co-creation of scientific knowledge, and science communication. The qualitative and quantitative approach included interviews, focus groups, and the said survey offering a holistic understanding of the universities' current status and future proposals. The methodology supported the creation of a strategic agenda and action plan adaptable to various scales, facilitating transformative knowledge and expert structures for the long term when implemented into their individual strategic plants.



2. KEY AREAS

Internationalization

1. Main Challenges: Primary challenges include a lack of financial resources and inadequate support for Early-Career Research staff. Bureaucratic difficulties, language proficiency, and awareness gaps about international programs were also noted.

2. Strategic Areas: Strategic areas for improvement encompass funding, support and communication, recognition, language skills, and other. Securing funding, particularly from the European Union, is crucial, and universities are advised to establish financial incentives for international collaborations. Dedicated offices for international affairs, language courses, and training programs are proposed to facilitate support mechanisms and enhance language skills. Recognizing and rewarding international research efforts, promoting diversity in research teams, and fostering inclusion are highlighted for overall improvement.

3. Policy recommendations:

- Universities can develop incentive structures that acknowledge international research partnerships and publications. Simultaneously, incorporating international research efforts into academic assessment criteria can encourage and legitimize global engagement. Providing personalized assistance, as required, in the preparation of international collaborative projects can also serve as an incentive for researchers to submit their applications.
- Providing specific training on accessing EU research funds is also a priority. This reflects the importance of securing external funding for international research initiatives. Universities can offer specialized workshops and resources to help researchers navigate the complexities of EU research programs, increasing their chances of successfully obtaining grants for international projects.
- Including information for students on internationalization opportunities in specific subjects or courses is essential. This not only exposes students to global perspectives but also encourages them to actively engage in international research projects, exchange programs, and internships. Improving communication requires developing a strategy to promote internationalization of students.
- Universities should incorporate internationalization components into curricula and provide guidance on available opportunities. It is important to develop maximum support to the internationalization of PhD students, and to promote international networks for them.

- Actions aimed at offering more institutional visibility to research groups and improving representation in international forums are positively viewed. Enhancing the visibility of research groups and researchers on the international stage can attract global collaborations and recognition.
- Development of a toolkit to attract foreign PhDs, early researchers coming to FORTHM Universities might involve guidelines on access to recruitment procedures or incentives, information on support services, such as housing, documents, job contracts, tax/insurance, etc.
- Universities can support participation in international conferences, encourage active involvement in international organizations, and promote the global impact of research findings.

These findings suggest that universities should focus on **providing financial support**, improving **support and communication**, enhancing **recognition** of internationalization efforts, addressing **language barriers**, and implementing specific actions in these areas to promote R&I internationalization effectively.



Open Science

Open science in universities refers to the practice of opening and sharing data, research results, methods, and research resources in an accessible and collaborative manner toward the scientific community, businesses, the broader public and society as a whole. This promotes transparency, collaboration, and the advancement of knowledge. Below are the key points of open science in universities and policies that can promote it:

1. Main Challenges: Many respondents lack a comprehensive understanding of open science, viewing it as a risk and expressing skepticism about research replicability. Collaboration among researchers, especially in sharing resources and tools, is deemed necessary for efficiency and innovation. Citizen science is largely unknown, indicating a lack of awareness about engaging the public in scientific knowledge.

2. Strategic areas: Strategic areas for improvement include open repositories and access publishing, with concerns about repository obsolescence and low awareness. Cross-cutting actions involve promoting open science across universities, fostering awareness and adoption among students and researchers. Citizen science is identified as a collaborative approach, enhancing data collection, scientific outreach, and public participation in generating scientific knowledge.

3. Policy recommendations:

- Further development of Open Repositories: Universities need to promote and upgrade their open digital repositories where researchers can archive and share their research results and data in an accessible manner. Proposed actions also include measuring the impact of open access publications, developing a university alliance-level support system for research data management, and raising awareness about existing open access repositories.
- Open Access Policies: Academic institutions can implement policies that require researchers to publish their findings in open-access journals or institutional repositories. Proposed actions in this area include creating a collective mandate for depositing publications and research data in open repositories, improving support for open access journals, and implementing actions to boost the quality and visibility of open access journals.
- Training and Awareness: Providing training and awareness to researchers and students about open science practices and the benefits of research transparency.
- Incentives for Data Sharing: Establishing incentives, such as academic recognition and additional funding, for researchers who openly share research data and results.
- Citizen Science Policies: Facilitating public participation in research through policies that encourage collaboration with the community on citizen science projects.
- Adoption of Open Standards: Promoting the use of open standards in data management and result publication to ensure information interoperability and reuse.
- Develop a system to measure the effectiveness of open science actions put in place by universities for researchers

- Information and training on Open Science because there is a lack of knowledge when it is mandatory to publish in open access and share research data in and from the FORTHEM Universities.

- Open Peer Review: Considering the implementation of open peer review systems where review reports and the review process are made public, promoting transparency in the review process in all university journals.

- Proposed cross-cutting actions include creating a strategic action plan, cataloging, and finding synergies in available infrastructure, improving existing strategies and communication, centralizing support for the scientific community, organizing events and podcasts, and reinforcing the presence of open science in curricula.

In conclusion, our project has identified challenges related to open repositories, open access publishing, and broader cross-cutting actions on open science. Proposed actions aim to address these challenges and foster the adoption and promotion of open science practices within FORTHEM universities. The successful implementation of these actions is expected to contribute to the realization of open science principles and further strengthen the alliance's commitment to openness and transparency in research.



Co-Creation and Quadruple Helix

The analysis highlights several key challenges and areas for improvement in integrating non-academic stakeholders within universities, particularly in the context of co-creation with these stakeholders. The challenges and recommendations can be summarized as follows:

1. Main challenges: Challenges include the need for improved networking, specialized personnel for knowledge transfer, and societal recognition of universities' research potential. Bureaucracy, unclear responsibilities, and a lack of incentives for research staff collaboration with non-academic partners are also highlighted as concerns.

2. Strategic Areas involve emphasizing technology commercialization and supporting regional innovation ecosystems and focusing on personnel training to enhance the local workforce and improve employability. Social Problem Solving emphasizes research addressing societal challenges, contributing to improved quality of life. Investment Attraction underscores the role of research transfer in attracting external investment and promoting economic and social development. Inter-institutional Collaboration highlights the importance of partnerships to collectively address regional and global challenges.

3. Policy Recommendations:

- Enhanced Training: Provide specialized training and development opportunities for staff involved in advising and managing co-creation processes. This training should include both technical and soft skills. It cannot be traditional, but case-study oriented and use different formats (i.e. focus groups, design workshops)
- Courses for Companies and other non-academic stakeholders: Create courses that address the specific needs of companies, businesses, NGOs, administration, etc. anticipating societal challenges. Encourage close cooperation between academic staff and university centers for knowledge and technology transfer.
- Encourage Interaction: Promote dialogue and interaction between academia and non-academic stakeholders through forums, networking events, and common platforms. Create spaces where companies can present their needs, and universities can showcase their capabilities. More resources are needed.
- Recognition for Third Mission: Establish a recognition system for third mission activities, such as co-creation and knowledge transfer, within academic careers. This can incentivize researchers to engage in these activities.

- Partnerships: Develop partnerships with external stakeholders, including government organizations, companies, investors, and venture capitalists. Encourage cross-sectoral collaboration and exchange.
- Challenge Events: Organize challenge events that involve students in solving real-world problems identified by companies. This promotes hands-on experience and problem-solving skills.
- Internships and Projects: Facilitate internships and joint research projects that bring together students, staff, and non-academic partners. Promote practical education with the support of local businesses.
- Institutionalize Networks: Establish a network that includes stakeholders, academics, and researchers, with a strategy for institutionalizing this cooperation. This network should foster knowledge exchange and mutual learning.

In summary, the integration of non-academic stakeholders within universities can be enhanced by improving networking, specialized training, recognition, interaction, and partnerships. These efforts aim to create a more robust bridge between academia and society, promoting co-creation and knowledge transfer.



Knowledge Transfer

Knowledge transfer is a key challenge for universities and is strategic for the FORTHM Alliance. Facilitating knowledge transfer between university researchers, civil society, business and public administration is essential. Knowledge transfer is essential for the scientific and technological progress of European society. Collaboration between universities and society is essential to boost economic and social development, improve the quality of life and promote competitiveness in a globalized world.

1. Main Challenges: Our work underscores challenges emphasizing knowledge transfer beyond academia. Despite being a central mission, participants note a lack of awareness about this mission outside academic circles, particularly in certain sectors and social groups. The academic community perceives a dearth of specialized personnel in legal and intellectual property aspects, hindering effective knowledge transfer. Excessive bureaucracy, a lack of incentives for research personnel, and challenges in intellectual property further impede the mission.

2. Strategic Areas to address these challenges include the establishment of Technology Transfer Offices, fostering Entrepreneurship and Innovation Ecosystems, and providing Intellectual Property Management expertise. Universities offer support through Incubators and Start-up programs, engaging in Collaboration with Industry to align research with real-world needs. Community Engagement and Local Impact initiatives address regional challenges, and a focus on Open Access and Knowledge Dissemination ensures broad accessibility. Public-Private Partnerships leverage research expertise to address societal issues collaboratively.

3. Policy recommendations:

- Networking and Partnership Building: Encourage collaboration between universities and non-academic partners through partnerships and networks. This may include organizing events and meetings to establish strong relationships.
- Promotion of Co-Creation and Collaboration: Encourage collaboration between university researchers, companies and public administration. This may include financial support for joint projects, promotion of doctoral theses linked to companies and support for co-creation laboratory projects.
- Dissemination and Recognition: Improve the communication of university transfer services so that their research and innovation potential is recognized. This implies effective communication through multiple channels.
- Training of Specialized Personnel: Invest in the training of specialized personnel who can manage knowledge transfer processes. This may include training researchers in collaboration with non-academic partners.

- Incentives and Support: Offer incentives and support for academics who participate in knowledge transfer activities. This may include financial support for researchers setting up companies and administrative support.
- Intellectual Property Management: Address issues related to intellectual property, such as the definition of ownership of technologies and rights, and establish clear procedures and guidelines for intellectual property management.
- Support Citizen and Social Science Projects: Promote the participation of society in the collection and processing of scientific data. Support entrepreneurial or social projects in various disciplines to foster knowledge transfer.
- Matchmaking between innovation demand and technology transfer.
- Training through examples of contracts including IPR issues (consortium agreements, MoU, NDA, contracts with companies for joint industrial research, etc.)

Knowledge transfer is an essential pillar for scientific and technological progress, and effective collaboration between universities and society is key to achieving positive impacts on society and the economy.



Science Communication

Science communication encompasses various activities aimed at conveying science-related information to a non-expert audience in an easily understandable manner through various mediums like written articles, videos, podcasts, social media posts, public lectures, and more. Science communication can bridge the gap between researchers and the public, increase public understanding of science, build trust in institutions, support evidence-based policy, and promote innovation and entrepreneurship.

1. Main Challenges: The challenges in science communication stem from weak experience in scientific conferences and outreach, insufficient dissemination channels, and limited inclusion in university strategic plans. Opportunities arise from increased post-COVID-19 public interest in science and the credibility of university researchers. However, challenges persist, including a lack of institutional incentives, researcher training, and stable technical staff for science communication. Conflicts with intellectual property, fake news, and researchers' concerns about media manipulation and social media opinions further complicate the landscape.

2. Strategic areas: Strategic areas for improvement encompass institutional support through dedicated structures and incentives, comprehensive training programs for researchers, addressing intellectual property concerns, and advocating for open access and data sharing. Continuous evaluation and enhancement of communication strategies are vital, along with active engagement in outreach activities, combating misinformation, and fostering a culture of science communication among researchers. Development of accessible and inclusive communication channels, involvement of the public through citizen science programs, and collaboration with science journalists are crucial. Lastly, promoting interdisciplinary communication within universities is emphasized to address complex global challenges effectively.

3. Policy Recommendation:

- Establishing Institutional Support: Universities should create formal structures and provide incentives, such as funding, career advancement, and recognition, for researchers who engage in science communication. This can be achieved by integrating science communication into the institution's strategic plans.
- Training for Researchers: Offer training programs and resources to equip researchers with the skills necessary for effective science communication. Focus on traditional media training and incorporate communication elements into Intellectual Property Rights (IPR) training.
- Intellectual Property Management: Develop clear policies and guidelines to manage intellectual property and promote the sharing of research results through open platforms and databases while protecting authors' rights.
- Public Perception Evaluation: Regularly assess and evaluate how universities communicate scientific results to society by conducting surveys and gathering feedback from the public to identify areas of improvement.

- Science Outreach Activities: Organize a variety of science outreach activities, including public lectures, exhibitions, and interactive events. Ensure these activities are tailored to the needs and preferences of different target audiences.
- Unified Social Media Management: Establish a unified and homogeneous system for managing social media channels, ensuring consistency and effectiveness in communicating research findings to the public.
- Combat Misinformation: Actively address and counteract misinformation about science by providing accurate information and engaging with the public. Promote evidence-based information, quote sources, and disclose research sponsors to maintain transparency and trust.
- Tailor to the target: broad enough, focused enough.
- Promote a Culture of Science Communication: Encourage researchers to participate in science communication through training, support, and recognition.
- Develop Accessible Communication Channels: Utilize digital tools and media to reach a wider audience, ensuring accessibility for people with disabilities and non-local language speakers.
- Involve the Public in Research: Establish citizen science programs to involve the public in research projects, promoting engagement and communication between researchers and the public.
- Collaborate with Science Journalists: Partner with science journalists to effectively communicate research findings, including media training for researchers and joint communication campaigns.
- Promote Interdisciplinary Communication: Encourage interdisciplinary communication among researchers, fostering a collaborative approach to communicate findings in ways that are accessible to all.
- Develop a way to measure the effectiveness of science communication strategy.

By implementing these strategies, universities can enhance their science communication efforts and ensure that research findings are widely understood and appreciated by the public.



4. SUMMARY

Challenges for Enhancing Research and Innovation in Universities

1. Inadequate Direct **Financial Resources**: Insufficient funding and financial support for international research and study programs pose a significant challenge. Around 74% of respondents expressed this concern, particularly researchers and teaching staff.
2. Support for **Early-Stage Research Staff**: Providing adequate support for Early-Career Research staff was identified as the second significant challenge. 68% of respondents, primarily teaching and research staff, emphasized the need for better support mechanisms.
3. **Lack of Information** on International Study and Research: A significant challenge is the lack of information about opportunities for studying or conducting research at foreign universities. Approximately 64.8% of respondents highlighted this issue.
4. **Insufficient Permanent Specialized Staff**: Inadequate permanent specialized staff for providing technical support and advice during proposal submission is another challenge. 63% of respondents saw this as an obstacle.
5. Lack of Institutional **Incentive Policies**: The absence of institutional incentive policies and academic recognition for international proposals was identified as a key issue by 60% of respondents.
6. **Recognition** of Research Careers Developed in and abroad: The lack of inter-university mechanisms to recognize research careers developed in other countries presents a challenge, as identified by 60% of respondents.
7. Lack of Institutional **Guidelines and Strategies**: The absence of institutional guidelines or strategies for research and the transfer of research results is another area for improvement, highlighted by 59% of respondents.
8. **Bureaucratic barriers**: Respondents noted bureaucratic difficulties in validating studies or research work carried out abroad. This challenge was mentioned by 55.8% of respondents.
9. **Language Proficiency**: Language proficiency, particularly in English, is seen as a barrier by more than 40% of respondents, especially for administrative and services staff. The low English proficiency of researchers is considered a problem that affects participation in international funding programs.

Actions to Improve Research and Innovation in Universities

1. **Financial Incentives and Academic Assessment:** Prioritize the implementation of financial incentives or academic assessment mechanisms to motivate researchers to engage in international research and study programs.:
2. **Training** on EU Research Funds, on open science, science communication, etc.: Develop specific training programs to educate researchers on how to access EU research funds, increasing their awareness of funding opportunities.
3. **Information for Students:** Include information on internationalization opportunities within specific subjects or courses to help students become aware of study and research abroad options.
4. **Institutional Visibility** and Representation: Implement actions aimed at offering more institutional visibility to research groups and enhancing their representation in international forums. This can include promotional activities and participation in conferences.
5. Enhancing **Language Skills:** Provide language proficiency courses and support to improve researchers' language skills, particularly English, to reduce language barriers.
6. Promoting **Open Science:** Encourage open science practices and open access publishing to facilitate the exchange of research findings.

By addressing these challenges and implementing the suggested actions, FORTHEM universities can enhance research and innovation efforts, thus promoting greater collaboration and knowledge sharing among academic institutions, researchers, and the international community.





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Transformation
of R&I Policies in
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