Synthesis Report on Best Practices

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Acronyms of Partner Universities

- **BTU**: Brandenburg University of Technology Cottbus-Senftenberg
- **PUT**: Poznan University of Technology
- **UC:** University of Cantabria
- **UMONS**: University of Mons
- **UNICT**: University of Catania
- **UPHF** : Université Polytechnique Hauts-de-France
- **UVA:** University of Vaasa

Executive Summary

In this report we use the broadest literature streams to identify generalisable best practices for universities to collaborate with Industry, Governmental institutions, and other sectors. We identify 69 best practices by using literature reviews looking at University-Industry collaborations and University-Third sector collaborations. These best practices are then categorised as *student*, *researcher*, and *school-wide engagement*, as well as *access to resources*, *economic development* and *multi-faceted relationships*. Each category has three levels of engagement to qualitatively describe the intensity of the engagement – transactional, cooperative, and alliance levels of engagement. The summary of these best practices can be found in part 2.7 of this report. As part of the practical review, we conducted 8 interviews with EUNICE partner universities to identify any best practices that have already been implemented to exemplify the identified best practices. Based on these interviews, we identified 49 cumulative practices across the universities that exemplify the identified best practices.

Contents

1. Introduction

This report represents the deliverable 2.1 *Synthesis report on best practices* of work package 2 within the Horizon2020 project REUNICE *Research with and for Society in EUNICE*. The report presents the outcomes of Task 2.1, with the purpose of identifying best practices in the cooperation between universities and other sectors.

It is apparent that academia, industry, governments and other sectors interact and cooperate with each other in various ways – some simple, some more complex, some requiring many years to build, some more successful, some more challenging. The report looks at both theory and practice. In the theoretical part, we take on a holistic perspective and summarize the outcomes of an extensive literature review using a modified version of the categorisation introduced in the Partnership Continuum Model by the UIDP (Southerton et al., 2012). The categorisation includes six sections with three levels: Six areas of engagement are used to categorise the identified best practices, and three levels of engagement are used to identify the intensity of the engagement. To construct the literature review, a combination of 27 relevant academic articles, panel talks, and whitepapers were analysed. The whitepapers and panel talks were selected on the basis of their relevance to best practices from content produced by the University Industry Partnership. The academic articles were selected based on an analysis of their abstract and key words. Despite the majority of the literature having a university-industry background, we believe that these best practices are generalisable, as analysis of other (e.g. third sector) papers indicated that there was not much difference for best practices when collaborating with other sectors. Because of this we also abbreviate collaborations with all sectors to University-Industry collaborations (UIC), despite the fact that these best practices also cover other sectors.

For the practical side of the report we conducted semi-structured interviews with the EUNICE Alliance universities. The interviews were split into best practices identification and a part relating to REUNICE WP2 task 2.2 and 2.3 focusing on the development of a collaborative platform. The identified best practices are translated onto the structure used in the literature review to exemplify some best practices. Examples from UVA are drawn from the knowledge of the staff members who are involved in these activities. The interviews were conducted primarily with Technology Transfer Staff or similar titles under the assumption that this sort of staff would bring quality information to the fore with respect to industry collaboration practices. 8 interviews were conducted between March and May 2022 with 1-2 staff members from the University of Vaasa as WP2 leader. The interviews spanned 12 staff members from the different universities. The interview guide is attached in Appendix 1 of this report.

The rest of the paper is structured into a literature review section, a visualisation of all identified best practices, a third section discussing the interviews and examples of best practices, and then a conclusion.

2. Best Practices for collaboration as presented in existing literature

The best practices for collaboration between universities and other sectors (industry, government, third sector) are often organised and categorised in different ways. In this report we will follow a modified version of the structure as presented by the University Industry Demonstration Partnership (Southerton et al., 2012). The structure presented by Southerton et al. in their whitepaper includes different areas of engagement, however these areas of engagement are treated as almost mutually exclusive. Academic literature agrees that this is not the case (Awasthy et al., 2020; Pertuzé et al., 2010; Sjöö & Hellström, 2019). The modified structure re-orders Southerton et al.'s model to be more intuitive with the first three areas of engagement being student-oriented engagement, researcher involvement, and then involvement with Schools. This shows a progression of scale, but maintains the idea that all three of these areas of engagement are closely linked. The last three areas of engagement relate to access to resources, economic development and multi-faceted relationships. The former two tend to be more standalone. Though, multi-faceted relationships are always complex and holistic in nature (Southerton et al., 2012) – so they are in a way an add on to the model that transcends and combines all the other areas of engagement with it.

It is important to pay some attention to how we define a best practice as pointed out by academics in different areas (Peters & Heron, 1993). "Best" implies that there is some element of comparability between different practices (Bretschneider et al., 2005; Peters & Heron, 1993). However, practices are not always comparable, as many practices are context dependent – for example Pertuzé et al. (2010) study best practices in UIC and look at more than 100 projects. Each project may have similarly named practices; however, the implementation of these practices is not homogenous or identical. The goal of this report is to identify best practices, therefore what literature consistently mentions as practices for known challenges in collaborations will be taken as best practice. Another important thing to keep in mind is that this report aims to look beyond 'just' university and industry collaboration. To do this we also analyse literature from multiple literature streams.

The structure proposed by the UIDP in Southerton et al.'s whitepaper also includes different *levels* of partnership. These levels are not mutually exclusive in that a partner

can be working on several different levels simultaneously in single or multiple areas of engagement with a university. The levels with an increasing degree of engagement from 1)-3) are:

1) Transactions – where these are comprised of tactical interactions as two (or more) parties recognise they have something that each value, and they are willing to trade.
2) Collaborations are when involved parties recognise that sharing is of mutual benefit. The key here is that the transactional nature of the first level is much more blurred if it exists at all.
3) Alliance level – at this level both parties are on equal footing with strong strategic alignment. Alliance level commitments tend to be longer term.

We use these levels to help us categorise different best practices from literature.

In the following sub-sections, the six main categories of engagement are presented with supporting relevant literature.

2.1. Student-Oriented Engagement

Student engagement as the most common type of engagement. This is probably because the threshold for engagement is so low. Literature shows that there are several best practices to engage students for collaborations with institutions beyond university (Garces et al., 2021; Hall & Chapa, 2021; Mark Shucksmith, 2016; Sjöö & Hellström, 2019). Typical transactional interactions include career fairs, job seminars, sponsorship of student activities, poster sessions, challenges and the like (Southerton et al., 2012). From both the industrial side and the university side it is important to engage with the students at a personal level for any sort of engagement activities (Dudkowski, 2021; Garces et al., 2021) , be it a transactional level 1 activity or a level 3 alliance type of activity. Personal level engagement does not mean that everything is customised with their name, but it means that there is a genuine intent to get to know the student better and to help them achieve what they want. This obviously is more difficult at a transactional level, which is why soft skills and wider involvement are often required (Ankrah & AL-Tabbaa, 2015; Garces et al., 2021; OECD, 2019).

Progressing to level 2 – i.e., collaborations – student engagement begins to take a more industrial approach with firms looking to engage for design projects, theses, teaching and offering projects as case studies, curriculum development, grants and internships (Southerton et al., 2012). For universities, this has some “easy” implications on best practices: staff and the institution at large should make it clear where such opportunities are available for industry (Dudkowski, 2021; Garces et al., 2021; Hall & Chapa, 2021; Mark Shucksmith, 2016; Sjöö & Hellström, 2019), and should be able to shoulder the

responsibility that comes with hosting such opportunities. There is also support from the literature for doing other practices to support this sort of student engagement like ensuring that the university knows the skillsets it is producing, and ensuring that there is multi-channel and clear communication to all of those who are involved in student engagement (Calder, 2007; de Wit-de Vries et al., 2019; Sjöö & Hellström, 2019).

Some literature suggests some best practices that in the UIDP Partnership Continuum would be on the alliance level. Such activities include student consultancy, co-operations, and sponsorship of research. Literature also suggests that universities should push the teaching of entrepreneurial skills, as this is a trait that is highly valued in industry, and if the students remain in the research world will benefit the university by pushing an entrepreneurial culture (Hallonsten, 2017; Perkmann et al., 2011; Sarpong et al., 2017).

Outside of the activities, there are also best practices which are related to more specific aspects of student-oriented engagement in the context of UIC. For example, Awasthy et al. (2020) maintain that there needs to be a push towards more impactful and applied research and studying. Bartunek (2011) maintains that there should also be a pathway for people from industry to return to studying quite easily. For example, courses that look at specific skills needed to become an executive, manager, or other forms of applied learning to further one's professional career. Another practice that is crucial and is consistent throughout all the levels of engagement is to understand the motivations and incentives required for the students to participate should their intrinsic motivation not suffice. Examples of how to motivate students is to make credit points available for involvement with industry. This also brings credibility to collaborative courses that industrial partners push. Shucksmith (2016) also encourages universities to support students wishing to volunteer to third sector organisations. This obviously implies that universities need to adopt an open mindset to working with third sector organisations and adopting both active and passive strategies for reaching out to them.

2.2. Involvement with Researchers

When industry seeks to get involved with researchers, traditional transactional level engagement often looks like Material Transfer agreements, consulting arrangements, grants for software/hardware/patents, guest speaking, recruitment, and seminars (Southerton et al., 2012). These are all excellent tools *for industry*. This does have implications for researchers though. To attract transactional level interactions researchers must have well known goals, interests, and channels of communication(Hall & Chapa, 2021; UIDP, 2012) . Universities should support activities that go towards improving knowledge transfer mechanisms and involvement of researchers with industry (Ankrah & AL-Tabbaa, 2015; de Wit-de Vries et al., 2019; Mascarenhas et al., 2018).

Some of the practices that universities can use to facilitate researcher engagement are to have clear technology transfer processes, so that researchers may use these mechanisms when needed (Mascarenhas et al., 2018; Vick & Robertson, 2018). Universities should also have clear lines as to how to proceed with collaborations, whether this means having to go through a central office or simply mentioning it to a superior. It is important to note that the literature does not have strict recommendations for these sorts of practices (Technology Transfer Offices and support functions) as these vary from context to context, and may depend on local law too (Bentley et al., 2021; Garces et al., 2021).

Best practices that go onto the cooperation level include sponsored research and trials, industrial/academic sabbaticals, faculty appointments and philanthropy (Southerton et al., 2012). There is strong support in literature for the idea of sabbaticals and staff exchange between universities and partners (Liew et al., 2012; OECD, 2019). This again has the implication that universities should have clarity around the availability of such opportunities within their institutions. It also means that universities (and indeed researchers) should proactively encourage such practices within their network of companies. To obtain sponsorships, universities should encourage entrepreneurship to make it low threshold and easy to envisage for researchers. As such, ensuring that there are awareness programs about entrepreneurship opportunities as well as basic courses to learn about entrepreneurship and what it entails are good places to start to encourage researchers to be more entrepreneurial (Ankrah & AL-Tabbaa, 2015). Universities, as part of best practices, should regularly put themselves in their researchers' shoes and look at how the incentives and motivations look and address the incentives if there are any imbalances (Perkmann et al., 2011).

When it comes to the alliance level, the partnership continuum presents fewer activities of which – Collaborative research projects and joint applications for funding (Southerton et al., 2012). This leads to the discussion of partner selection. Industrial players will often look at basic metrics such as publications, citations, shares of income from industry, impact, and experience (Garces et al., 2021). Some of these are easier to measure than others, but this does not change that university should support individual researchers in each of these areas. For example, there should be strong publication mechanisms at university and a focus on "good" science as Sarpong et al. (2017) explain.

For researchers themselves, the best practices include strong communication channels with their personal networks to ensure that the network is always alerted to opportunities for collaborations, and is well familiar with the researchers' methods and work (de Wit-de Vries et al., 2019).

Looking at the third sector, Shucksmith (2016) believes that there should be training programmes for researchers to engage with the third sector and to grow the understanding of each other. Researchers should also encourage the third sector organisations they have within their networks to take contact with universities should there be a need for collaboration. An excellent example of this could be sports clubs collaborating for research of injury prevention protocols, or training protocols. Alternatively, it could be something like a horticulture club looking to research to divulge research to make it applicable within their own gardens.

2.3. Involvement with Centres of Expertise and Schools

Universities are usually organised into different areas. The wording used varies a lot country to country – Colleges, Schools, Centres of expertise, Platforms, etc. However, the fact remains that these are concentrated areas of expertise around certain topics producing both knowledge and human capital. As a result, industry has an inherent interest in collaborating with these entities – whatever their nomenclature Industrial interest in collaboration stems from the stream of capable work force resulting from the centres of expertise, but also the potential to solve problems that industry is facing. The third sector can similarly make use of the knowledge and human capital (Bentley et al., 2021; Hall & Chapa, 2021; Hallonsten, 2017).

In the partnership continuum, the most basic best practices include having things like mailing lists and having guest speakers available – essentially the basics of proactive and passive knowledge dissemination (Southerton et al., 2012). These best practices also function as basic marketing for the centres of expertise. These level 1 best practices should also establish a *clear* point of contact for potential collaborators as literature around best practices consistently hammers home the point that it needs to be easy for people to get in touch (Bentley et al., 2021; Calder, 2007; Garces et al., 2021; Mgonja, 2017). This also links into a practice that panel talks with American industry tend to promote – the creation of a dedicated engagement office on both university and industrial sides (Bentley et al., 2021; Hall & Chapa, 2021; UIDP, 2012). The goal of this office being to act as a central networking hub for centres of expertise across the university. European literature tends to have less focus on such offices, given some evidence around the idea that individual researchers' networks and networking ability should be favoured for improved impact and repeat collaborations (Mascarenhas et al., 2018; Vick & Robertson, 2018).

At the second level of engagement, the partnership continuum presents educational activities, conference sponsorships, affiliation agreements, research centre memberships, industry associate memberships, participation in school or advisory

boards, and support to academic proposals from industry (Southerton et al., 2012). At this level, the best practices proposed by literature cluster around being an attractive university department to collaborate with As a result, basic evaluation metrics need to be considered. The basic, easiest metrics to measure is publications, grants, and patents (OECD, 2019; Sjöö & Hellström, 2019; Wunsch-Vincent, 2012). Some other metrics mentioned in both literature and panel talks with industry include "responsiveness", and cultural fit (Garces et al., 2021) . Wunsch-Vincent (2012) also proposes metrics around consultancy services provided by the university as well as the creation of spinoffs and academic entrepreneurship as metrics that improve the desirability of a university department as a collaboration partner.

At the alliance level, collaboration with departments may look like cost sharing on proposals, mixed consortia with industry involvement, as well as sponsorship of university initiatives (Southerton et al., 2012). When collaborating at the second and third levels, it is hugely important to have contracts and policies around intellectual property (Bentley et al., 2021; Dudkowski, 2021; Garces et al., 2021; OECD, 2019; UIDP, 2012). A best practice recommended by literature – especially for joint research projects – is to resolve any contractual issues around potential intellectual property generated by the research *prior* to starting the project. This way, once the project is underway, there should be no disputes or fall outs caused by IP intellectual property.

At all levels of involvement with centres of expertise it is important to have good quality controls in place (Ankrah & AL-Tabbaa, 2015; Awasthy et al., 2020; Hallonsten, 2017). This ensures that the reputation of the institution is safeguarded, but also allows the impact of the work to be greater for a longer period of time. MacLean et al. (2002) also mention that quality controls will be different based on the partners – for example, in third sector collaborations quality controls tend to have many more criterions and different perspectives due to the breadth of the stakeholders' interests in such projects. Most literature looking at the "in-process" part of projects between universities and partners mention the best practice of having specific roles for project champions, sponsors, as well as knowledge transfer roles (de Wit-de Vries et al., 2019; Mgonja, 2017; Pertuzé et al., 2010). Additional roles suggested by literature are boundary spanners and single project managers. Calder (2007) actually recommends trying to combine some roles – namely the project manager should be a boundary spanner. Sjöö and Hellström (2019), as well as an OECD report (2019) both point towards best practices regarding policies and regulations from universities. They both mention that university policy should encourage and simplify collaboration rather than making it more difficult. The OECD report provides the idea that there should be complementarity around Financial, Regulatory and Soft policies. Where financial and regulatory policy should be fairly straightforward. Soft Policies refer to awareness building, codes of conduct, standards, etc. When Collaborating with a centre of expertise MIT Sloan (Pertuzé et al., 2010) also published an article where an important best practice was

mentioned – creating awareness for the project at a broader university and societal level. This is important for the later stages of the project, when commercialisation or branching out may be involved. The university at large should be aware of what projects are occurring within the institution (Awasthy et al., 2020; Pertuzé et al., 2010).

2.4. Access to resources

Access to resources is a recurring issue (Bentley et al., 2021; Dudkowski, 2021; Garces et al., 2021). More resources would always fix any issue. So, what are some best practices in UIC that can be used to go around this?

From the partnership continuum, some obvious transactional solutions are addressed: shared resources, shared cost centres and laboratories, library access, using shared information systems, etc.(Southerton et al., 2012). Sjöö and Hellström (2019) also remind us about the existence of the triple helix, and this fits in well to the transactional level, where universities can apply to local funding as well as for seed funding for spinoff activities in which partners may have a stake. The government can also often support and fund (partially or fully) some research parks and incubators which are common cost centres. Vick and Robertson (2018) and Ankrah and Al-Tabbaa (2015) also suggest sharing spaces. Both authors argue that this is beneficial not only from a resource point of view, but also from a knowledge transfer perspective. Where literally bringing academia and industry into the same building might lead to additional constructive knowledge spill over.

This leads nicely into the second level – cooperation. Sharing educational opportunities, certificate programmes, remote working/learning and gig research (Southerton et al., 2012) are all part of cooperative practices that can be enhanced through some of the practices mentioned in literature. De Wit-De Vries et al. (2019) also mention the practice of incremental involvement – by which firms and universities alike should take care when collaborating with new actors. Incremental involvement avoids engaging on large scale projects only to find out that there is a cultural dissonance between people.

At the very top level of the partnership continuum putting resources aside to pursue shared strategic goals, shared investment into space and customised executive education (Southerton et al., 2012). This ties in strongly with another UIDP publication in which it is mentioned that when looking for resources it is crucial to identify each other's' needs (UIDP, 2012). Especially when at the alliance level where needs are essentially shared. When universities and external actors become so involved in projects together, it is also important to implement resource allocation and accountability mechanisms as suggested by Sarpong et al. (2017). Ankrah and Al-Tabbaa also mention

that at the very extreme of collaborations it may be possible to get in a situation where mergers occur (2015).

Access to resources is an important issue for SMEs as well, as they often have even more limited resources than larger or multinational firms (de Wit-de Vries et al., 2019). As a result, it is important for universities to develop some sort of offering to SMEs and make it clear that they are putting the research and expertise of the university at the disposal of these smaller firms (OECD, 2019). When collaborating with the third sector at any of the levels, the same best practices apply when looking at access to resources.

2.5. Economic Development

Often collaborations are motivated by economic development. Whether this economic development of a company, a region, or a country, it is usually positive. Universities also have ways to commercialise knowledge through spinoffs and startups which may boost the economy (Mascarenhas et al., 2018), but need people to get involved. As such, the partnership continuum outlines that at the most basic level of engagement for economic development, there should be classes centred around entrepreneurship, as well as business courses, seminars, and conferences organised with relevant industrial actors (Southerton et al., 2012). The key to economic development from the very transactional level onwards is to have clear commercialisation mechanisms established in the university (Bentley et al., 2021; Liew et al., 2012; Mgonja, 2017). These commercialisation mechanisms should be familiar to researchers. A best practice is then indeed to create awareness courses into how commercialisation works, what the incentives for commercialisation are, and how researchers can get involved with commercialisation and other opportunities around commercialisation (de Wit-de Vries et al., 2019; Vick & Robertson, 2018).

At the second level of collaboration for economic impact, the UIDP partnership continuum presents engagement for small businesses as well as engagement for more established companies. these engagement strategies include assistance, grants, facilities for startups, advisory boards for startups, patent licensing services from universities, patent donations, technical assistance (bi-directional), manufacturing and agricultural programmes (Southerton et al., 2012). At this point it is useful to mention that some literature mentions that there needs to be a proactive role within universities to commercialise and apply research output (Awasthy et al., 2020; Etzkowitz & Leydesdorff, 1998; Sarpong et al., 2017). As there has also been a constant call to make research more impactful (Pertuzé et al., 2010). As a result, impact should be measured and publicised in as many ways as possible and advertised by the university as success stories (Bentley et al., 2021; Calder, 2007). The third sector in particular has a focus on applied research as they often need pragmatic and high-quality solutions to problems they face (Hallonsten, 2017; Mark Shucksmith, 2016).

At the third level of economic development, campus incubators, research parks, and regional economic development initiatives all make the cut. However, here it is important to remember that in the frame of the partnership continuum it is an alliance. This implies the collaboration of several actors from all sectors to push for the best results (Southerton et al., 2012). This links to best practices such as expectation management, policies for multi stakeholder projects as well as supporting projects for potentially longer than the contract period (Mgonja, 2017). Additionally, accountability for project results should be a standard practice in such alliance set ups (MacLean et al., 2002; Pertuzé et al., 2010).

Transcending these levels, the quality of information and data may hinder economic contributions of projects, thus partners must maximise the quality of information or data used (OECD, 2019). Moreover, many projects need to be compliant to some standards, rules, or regulations. As a result, it is a best practice to always involve some compliance specialist(s) to ensure that a project is compliant to all the relevant standards (Ankrah & AL-Tabbaa, 2015; UIDP, 2012).

2.6. Multi-faceted relationships

In the Partnership Continuum model presented by the UIDP, all multi-faceted relationships are assumed to be of the alliance level. This is why the best practices here will not be organised by levels, but rather by topic. Southerton et al's model (2012) itself presents several engagement practices including: Lobbying at different levels, industry matching of public funds, roundtables, gifts, partnerships, joint communications and marketing, support of national organisations for university-industry consortia, employee matching programs, and University-Industry-Government interactions.

From literature such multi-faceted relationships are praised for generating heterogeneity and organisational diversity (Dudkowski, 2021; MacLean et al., 2002). This provides the broader skills required to undertake a variety of projects. Multi-faceted relationships should of course be planned and prepared with a modicum of due diligence (Bentley et al., 2021). As such, multi-faceted relationships should also strive to be longer term arrangements with commitments from all sides to deliver excellence in whatever output they have agreed on (Pertuzé et al., 2010; UIDP, 2012).

In such multi-faceted relationships De wit-De vries et al. (2019) recommend the use of rich communication through bilateral channels. This implies the use of face to face meetings over the use of phone calls, or phone calls over the use of e-mails and so on. This is mostly because communication is substantially imperfect. Thus, when there are several stakeholders, it is crucial for alignment to be clear, frequent, and with possibilities to adjust.

Speaking of adjustment, Awasthy et al. (2020) recommend the introduction of agile and flexible project management frameworks to be able to implement changes quicker and with frequent delivery and check points. This ensures that expectations are met and that if there are any changes in deliverables these are quickly addressed and expectations are managed accordingly.

An overarching point is that universities have a massive responsibility to themselves to advertise their full offering as clearly as possible over many different channels so that they may reach as many people as possible (Mascarenhas et al., 2018). Additionally, these self-marketing strategies need to go beyond just passive marketing, but also need to be active (Hall & Chapa, 2021). Actively participating in events and organising events inviting contacts and so on. And the available opportunities should always be taken seriously, especially if a firm or other contact offers a potential collaboration.

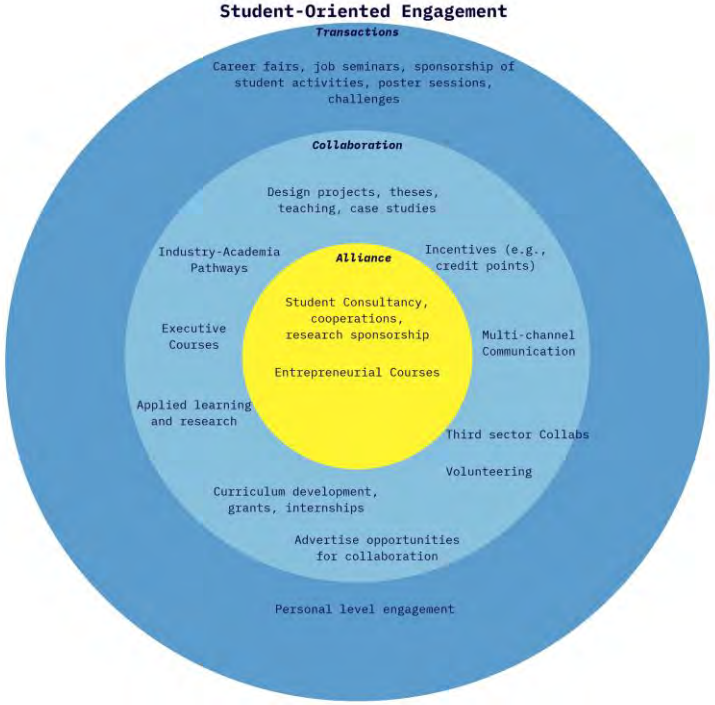
Another responsibility that universities have towards themselves but also towards their researchers is the creation of an entrepreneurial culture at the university (Etzkowitz & Leydesdorff, 1998; Sarpong et al., 2017). This allows researchers to have a broader perspective when they are conducting their research and participating in projects. Ensuring that these researchers have more rounded profiles with at least some understanding of the ROI commitment that the majority of stakeholders face. Sarpong et al. (2017)write about the concept of collective entrepreneurship whereby universities should set up incentives for applied research, create courses and awareness training programmes about entrepreneurship for all as well as the commercialisation process at the university, and lastly define the potential roles of entrepreneurship with partners rather than in isolation.

Universities should also not shy away from third sector collaborations, as the third sector (in the form of research institutes) have constantly proven their value to the economy and to innovations systems (Hallonsten, 2017). Third sector collaborations should also be geared towards long term collaborations, include staff exchange and have a clear service offering (Mark Shucksmith, 2016).

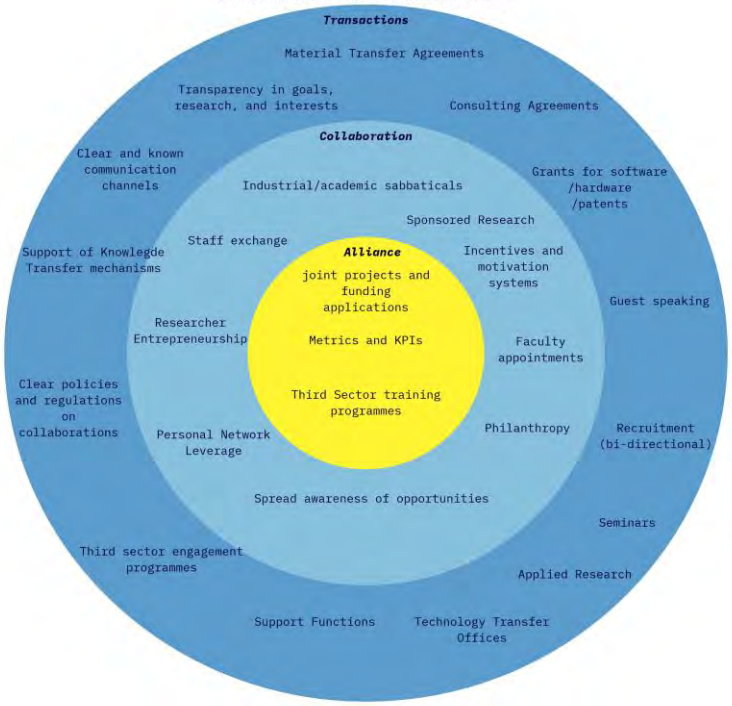
2.7. Best Practices Summarised

In the next page, the 69 unique best practices extracted from literature are visualised using levels and areas of engagement.

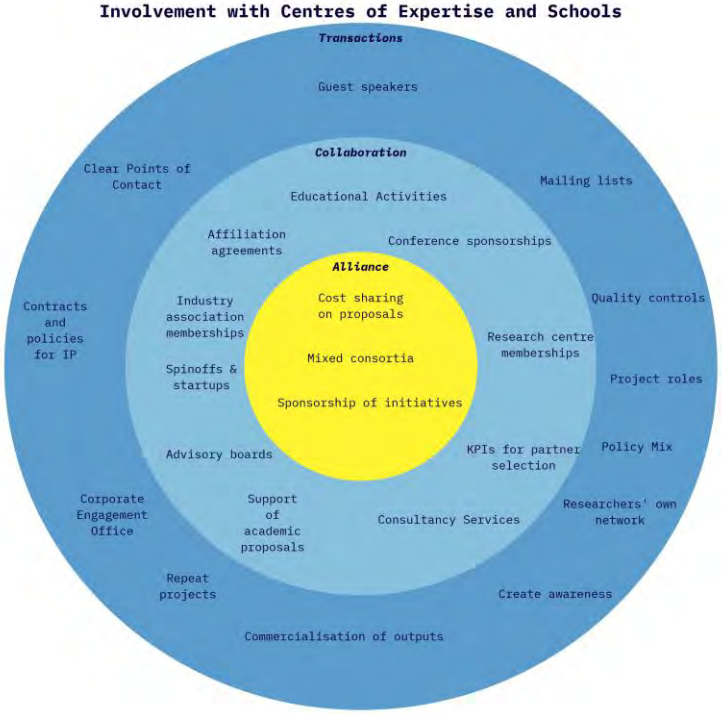
Student-Oriented Engagement



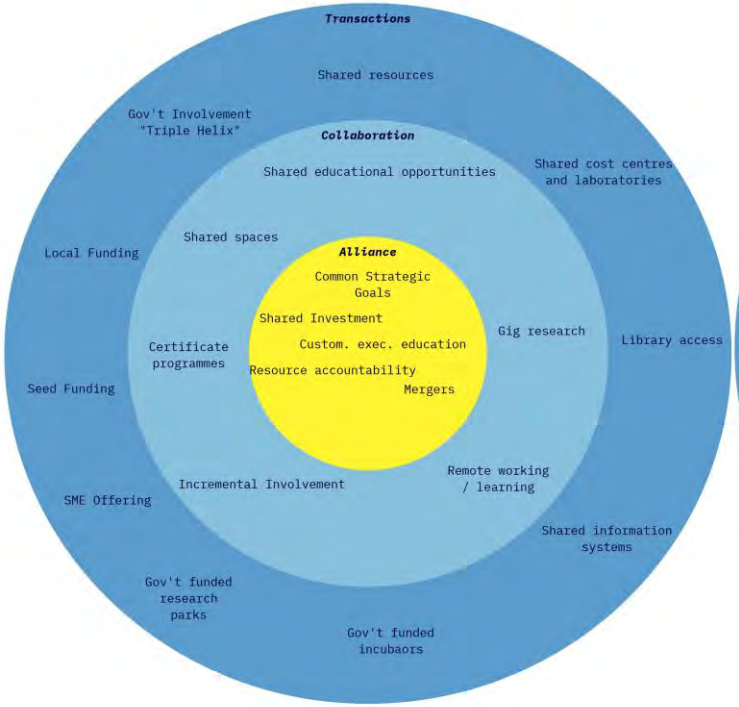
Involvement with Researchers



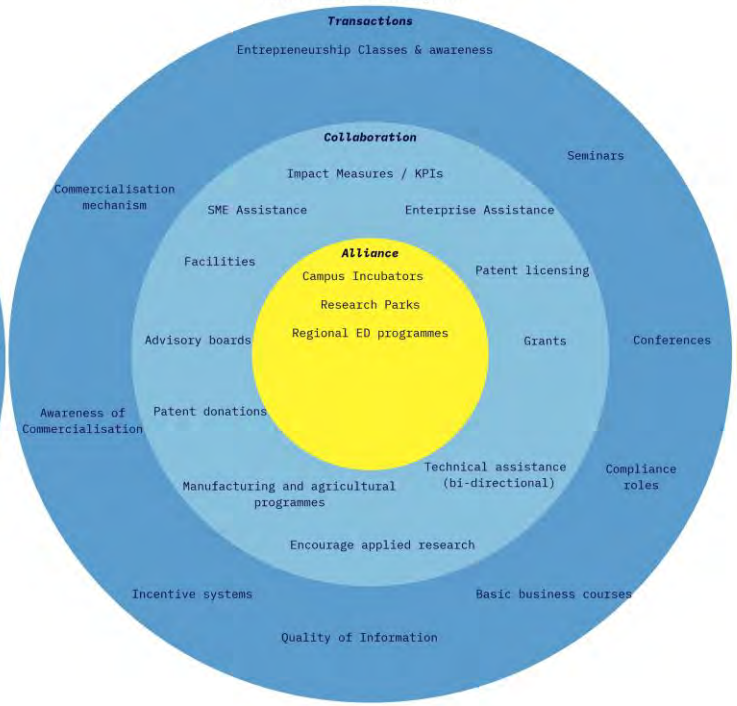
Involvement with Centres of Expertise and Schools



Access to Resources



Economic Development



Multi-Faceted Relationships

3. Examples of best practices in action among the EUNICE partners

For this section we interviewed all the universities who are part of the EUNICE alliance. The goal of the interviews is to uncover, at least superficially, what collaborative activities each university supports. It is important to note that because the interviews were semi structured these are not necessarily comparable between each other. The intention is not to present a holistic view of each university. The intention is simply to identify some examples of activity within the EUNICE alliance, which is in line with the framework presented in this report. One additional preamble is that because the best practices are qualitative, we do not categorise these into levels of engagement either.

The first category of the framework is student-oriented engagement. All the universities seem to have some examples for student-oriented engagement, and all universities seem to have some version of Industrial PhDs or Collaborative PhDs with industry. BTU had the best example of student-oriented engagement with their dual study programmes, which are already available at Bachelors level, in which students alternate between time at a partner company and time at the university. This creates a good link between the student and their partner firm as well as the firm and university. UC also offers Industrial Theses at all levels of education, which is good because this puts a focus on applied research from the very start of academic careers, even if the students eventually move to an industrial career later. PUT have recently introduced "implementation PhDs" to emphasise the need for applied research. These are *tripartite* PhD agreements between students, industry and academia to produce impactful output. To create an entrepreneurial university, several universities have incubators. PUT, UMons, and UVA all have some version of an academic Incubator, in which any student can come with ideas to develop them. UC have a specialty incubator for biotechnology. UC also collaborates with a local entrepreneurship centre for courses and awareness. UNICT also applies the idea of developing an entrepreneurial university by offering courses on spinoffs and entrepreneurship, as well as holding awareness trainings about IP. UPHF actually invests in time during which student can independently look for internships and participate in the economy using a concept of "lending" the students over explicitly academic collaborations with industry. UVA has recently introduced an entrepreneurship summer school, which it will be piloting this year to boost the entrepreneurial activities at the student level.

The second category is involvement with researchers. Most universities still have a strong consensus that a lot of collaborations should come from the researchers themselves, and therefore they give the researchers autonomy in managing their own networks. However, universities like BTU have introduced a role called "Transfer Scouts" as part of a wider research project. The role of the transfer scout is to match researchers

to opportunities within industry and vice versa (matching industrial actors with available researchers). In the interview it seemed that this was a relatively successful initiative as other universities are experimenting with the role, and some courses about how to perform the role optimally are being rolled out. In Spain, the UC has a researcher portal in which all the researchers' interests and profiles are available. This portal also includes metrics in visual styles to make it more attractive for potential collaborators to find the researcher they want to collaborate with. UNICT, who have only recently set up a formal TTO office are trying to implement more of a communication culture, as with the TTO being relatively recent, researchers need to get used to communicating their collaborations with them. This is a good initiative because researchers should be trying to raise awareness for their research anyway. Both PUT and UC have some incentive systems that were explicitly mentioned in the interviews. PUT rewards projects that go beyond just financial gain by incentivising projects that also drive personal growth in researchers. UC were subject to a nationwide change in the way researchers are evaluated, where now there is a stronger contractual incentive to produce research output that is meaningful and useable. In most interviews it was also explicitly mentioned that the universities are somewhat active in networking and dissemination activities which are researcher driven. UMons also have a concept of "Collaboration Themes" which goes for both students and researchers. The idea is that every year a theme of collaboration is chosen, and then the focus of the collaborations that year converges around that theme. For example, it could be "hospitals", and so most research collaborations would target hospitals or the supply chain surrounding hospitals. UPHF has a unique set up in that its laboratories and facilities are partially outsourced into a shared space with industry called ValuTec. This creates fertile ground for both applied research but also opportunities for collaboration. Where ValuTec per se is a subsidiary company that owns laboratories and rents them out for research. The UPHF is a majority stakeholder. UVA has been running workshops about commercialisation of research with its researchers. The goal of these workshops is to improve the awareness of knowledge transfer mechanisms and commercialisation of research.

In terms of access to resources it is no surprise that none of the universities are strangers to public funding. However, the interviews contained some insights into the role of the universities in their respective societal contexts. For example, the BTU caters to SMEs by regularly meeting with them and presenting them BTUs offering in terms of research. This is a positive and proactive way to get SMEs access to R&D resources that may otherwise go unnoticed for them. PUT recently joined forces in the Lukasiewicz Research Network giving them access to a shared laboratory with more than 10 other Polish institutes. UC has a dedicated office for third sector collaborations and activities, as well as access to a Scientific Park, which is where they host their Biotech incubator. UMons regularly get involved with local initiatives to share costs and funding through municipal activities. UNICT broker Joint Patents. This has the dual effect of easing the

resource need on the university side, but also ensures that there is a first established customer for research output. Since the UPHF innovation ecosystem is external it allows the ValuTec subsidiary to pursue initiatives that maximise ROI. At UVA access to resources is a continuous process with fundraising activities being looked at year round – this is with the intention to be as close as possible to any opportunities that present themselves.

Some examples of best practices for collaboration with the broader schools are the networking and dissemination events that all the schools attend in some capacity. With all the universities reporting that they are also part of a TTO network in the country. PUT also has a "Team for Cooperation with the Economy" which includes representatives from every faculty and is intended to facilitate the matching process of calls to the correct research groups. UMons, BTU, and UC all mentioned explicitly that they also have departments participate in their relevant industrial clusters.

Best practices for economic development have already been mentioned in other areas, including the industrial collaborations in teaching and learning, entrepreneurship, applied research, industrial clusters, and joint patents. Additionally, UMons participates in specific Business Clubs, which range from themed (e.g., Women's Entrepreneurship) to regional (e.g., Brussels based Business Club). Moreover, BTU, UMons, UNICT, and UC all mentioned that their service, patents, and software offering is available and advertised (at least passively) online. UNICT also have a "third mission" baked into their university strategy: the so called third mission focusses on societal economic and technological impact. This is in an effort to promote a culture for economic development. UVA has a strong focus on entrepreneurship to develop the Ostrobothnian region to be more than just the main actors that have represented the status quo for several decades.

Multi-faceted relationships are a part of the universities' that we were unable to explore due to the limited nature of our interviews. However, it is safe to assume that some of the universities have some engagement activities that are of a complex nature with multiyear horizons.

4. Conclusion

In this report we have analysed several different pieces of literature and extracted 69 different best practices for collaboration in an academic and research context. We then sorted these best practices into an identified Model: The Partnership Continuum Model from the University Industry Demonstration Partnership. This application allows us to identify both the area of engagement as well as the level of engagement to which the best practices are pertinent. This gives universities and other actors alike a better idea of the best practices that can be applied to improve collaboration.

To fortify this report, we also conducted eight semi-structured interviews with EUNICE universities to help us understand – at least superficially – what was already in place for collaboration. Here we identified 49 practices and activities that each institution was doing that exemplified an identified best practice at some level.

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6. Appendices

Appendix 1 – Interview Guide

Hello! Welcome to this interview guide for REUNICE WP2!

REUNICE (Research with and for society in EUNICE) is the EUNICE alliance's Horizon2020 project supporting research and innovation activities within the alliance. As you may not have been involved in the REUNICE project so far, we have created this guide to help you feel more at ease during the discussion. REUNICE WP2 focuses on promoting cooperation between universities and other sectors and includes the following main goals:

- mapping and identifying best practices in cooperation between universities and other sectors
- defining and piloting a platform solution for collaboration between universities and other sectors, primarily the business sector

The interview is divided into two parts, which support the two main goals:

Part 1 of the interview: Best practices in cooperation between universities and other sectors at your university

It is apparent that academia, industry, municipalities and other sectors interact and cooperate with each other in various ways. REUNICE WP 2 focuses on mapping the various ways in which the EUNICE Alliance universities are cooperating with other sectors in order to identify best practices of said universities. The mapping will be combined and complemented with a general literature review. The goal of this task is to understand factors that are key to building successful collaborations and to validate the needs of the EUNICE Alliance universities for cooperation with different sectors.

In this first part we want to hear your views on how a real university partnership would go in your specific institution. We value details you can provide based on your knowledge and experience.

Part 2 of the interview: Use cases for an Innovation Management / Expertise Exchange Platform

In WP2, a platform solution for collaboration between universities and primarily the business sector will be defined and piloted. We have identified and listed some potential use cases for the platform – these are presented below.

In the second part of the interview, we would like to discuss use cases of relevance from your point of view. We hope that you can bring up use cases we might not have considered and can give us a picture of platforms or solutions your university is already using connected to different

use cases. Additionally, if you already know about specific legal (or other) requirements that might need to be taken into consideration to implement the platform in your institution, please mention them.

Possible use cases:

- Continuously ongoing collection of ideas from staff and students
    - Including internal and external evaluation, decision making, maturing of ideas etc.
- Dedicated internal campaigns (e.g. launch campaign, sign up for hackathon etc.)
- Challenges posted by external strategic partners (industry)
- Continuous improvement of internal processes, way of working etc.
- Process for incubation/concepting etc.
    - Timed acceleration and non-timed incubation
- Invention disclosure process
- Access to similar cases (start-ups etc.)
- Fundraising support (list of investors, following the status, project use case, first contact, pitching etc.)
- Campaign with limited access (internal, external, different user groups etc.)