

University-Business Cooperation: Development of a Strategic School Unit at ESTG/IPVC

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Abstract

The goal of this paper is to discuss the practical challenges found in the operationalization of University-Business Cooperation (UBC) strategies, based on a contextualized example of a at Escola Superior de Tecnologia e Gestão (ESTG), the technologic school of Polytechnic Institut of Viana do Castelo (IPVC). The paper describes the process of development and implementation of a UBC unit, establishing broad range of partnerships with public, private and voluntary sector organisations, wich aims at fostering and strengthening the relationship between science and organisations. This Unit emerged from an organizational attempt to aggregate several Cooperation initiatives, including PBL Projects taking place within diverse courses, and enhance the possibility to create a strategic school "unit" in accordance with international recommendations in the field of UBC. The unit intends to consistently establish the conditions for cooperation between academia and organizations, providing guidance and strengthening efforts in the value chain between higher education and organizations. In general, the unit activities aim at maintaining high levels of strategic orientation, enhancing the development of student's skills, whilst contributing to social and economic development. It intends to encourage and promote knowledge sharing and transfer, create partnerships and long-term opportunities, developing and increasing students' creativity and innovation, through proven methods such as active teaching-learning methods, and therefore, increasing students' employability. These activities require the acquisition of knowledge associated with the development of an entrepreneurial stance, whilst supporting and promoting the diversification of sources of financing higher education. Simultaneously, this approach will provide a judicious and sustained development of the professional relationships and the work environment within and outside the school. In this School, different courses have established partnerships with several organisations since a long time, creating the necessary conditions for project-based learning approaches, and for the development of students' employability skills. However, these initiatives were carried out by teachers and courses, on a voluntary and independent basis. This paper presents the development process and organization of a UBC unit and describes the different hubs that are being proposed. Critical factors to take into consideration for the success and improvement of UBC initiatives will be discussed and pointed out, in the light of the existing literature in this field.

Keywords: University-Business Cooperation (UBC), Active Learning, Implementation, Polytechnic.

1 Introduction

Polytechnics in Portugal are public institutions spread along the country, mainly in rural locations where they act as the main higher education provider in the region, having an additional economical value by increasing competences and employment (Alves et al., 2015). Since 2006, Portugal has entered a democratization process of the higher education system, increasing the access to science (Heitor & Horta, 2014) and stimulating major competence development, by providing the opportunity for a large majority of students to access public institutions. Public polytechnics have a key role in rural areas, where students are often the first-generation students (FGS) in higher educational systems (Spiegler & Bednarek, 2013). Also, specifically for this first-generation student, institutions have a crucial role in supporting and developing motivation, by understanding their needs, and their social, familiar, or individual underlying processes, that may hinder students to remain in higher education systems (Petty, 2014). Stebleton and Soria (2013) have identified barriers that first-generation students are more likely to encounter that can influence their performance on higher education, compared to non-first-generation students, such as job responsibilities, family responsibilities, perceived weak English and math skills, inadequate study skills, and feelings of depression. These students often see themselves as "the ones that are going to be unemployed." Under these circumstances, as is the case of IPVC (Viana do Castelo

Polytechnic Institute) that serves mainly rural communities, it is highly recommended that higher education institutions (HEIs), find more capable learning methodologies that can enhance students' engagement and motivation. As Petty (2014) refers, in this motivation process, it is relevant that more active methodologies are used so that these differences can be overcome and that these students can achieve a higher education development. Most of these sound methodologies are of a collaborative nature, widely acknowledged in the literature as University-Business activities (UBC). UBC is the collaboration of universities (Polytechnics included) and businesses, often with the support of governmental organisations, for mutual and societal benefit, helping universities to face the problem of decreasing public funds, and helping businesses to gain and maintain their competitive advantage in today's dynamic international markets (Davey et al., 2011). UBC has become one of the top priorities for governments, higher education policies, education systems (Plewa, Galán-Muros & Davey, 2015) and has attracted a huge demand from employers. This demand from different stakeholders has enabled universities and businesses to work together in the creation of cooperation initiatives that can provide relevant results for both (Hasanefendic, Heitor & Horta, 2015). Hasanefendic et al. (2015) debated the relevance of the intermediary institutions, such as the public polytechnics that should promote problem-based practices, learning together with the implementation of short-term project-oriented research. These practices can be integrated in university-business cooperation and respond to several goals from different stakeholders. The practices are relevant in order to respond to the student's needs, as stated above, but can also provide relevant research contexts through this privileged access to organizations, including social and economic actors in the region, through formal or informal collaborative mechanisms (Hasanefendic et al., 2015). Hasanefendic et al. (2015) highlight the relevance of short-term project-oriented research as a motor towards the institutional credibility, through the engagement of local and external organizations and their commitment in training together with the higher education systems, students that represent the next labour force.

Moreover, UBC creates mutual benefit for all parties involved, contributing to the economic development at regional and national level (Mueller, 2005), as well as meeting the demands of the labour market (Plewa, Galán-Muros & Davey, 2015), providing local businesses with access to research breakthroughs and helping them with problem-solving, by increasing the employability of students (Gunasekara, 2006). Within our specific context of rural SMEs, it is complex for universities to get access to organizations and also to be acknowledged as a strategic partner. The challenge of HEIs is to create instruments that "open up" the university for small companies, increasing open communication and inter-organizational trust (Davey et al., 2011). According to Plewa et al. (2012) the foundations that are drivers of business engagement in the design and delivery of the curriculum at university-business cooperation includes external communication, *alumni networks* and senior management engagement. Thus the development of common knowledge platforms and an understanding of each other's aims are deeply relevant in the construction of these specific projects. Raising awareness about which activities and services are available is considered to be crucial at initial phases of Cooperation Units establishment (Plewa et al., 2012). The authors also advocate that strategic collaborations should be implemented, rather than discrete, ad-hoc or one-way transfers of knowledge or technology. In addition, HEIs are now considered to be operating in markets where it is imperative for them to make use of marketing instruments (external communication) to be successful (Baaken et al., 2016). There are a series of factors that can influence the ability of HEIs or academics to undertake and pursue UBC including specific barriers, drivers and situational factors (such as age, gender, years working in the HEI, years working in business, type of HEI, size of HEI and country). However, the 4 strategic pillars, and conditions for successful UBC can be summarized as the strategies, structures and approaches, activities and framework conditions which can be implemented (action items). These can directly stimulate UBC or indirectly address influencing factors affecting UBC (Davey et al., 2009).

The aim of this paper is to discuss the conditions for UBC (Opportunities and Challenges) and describe the process of creating a University-Business Cooperation (UBC) Unit at ESTG-IPVC (Technology and Management School - Viana do Castelo Polytechnic Institute). The main driver that supported this unit is therefore the belief that undertaking fragmented university-business cooperation activities within university-business cooperation ecosystem needs to be considered towards an overall university-wide approach for collaborating with businesses.

The specific objectives of this paper are:

- to discuss the conditions for UBC at ESTG;
- to explore the relevance of the adoption of a more structured and formal approach to university-business cooperation;
- to describe the creation and organisation of a UBC unit, at this Public Polytechnic (IPVC) at a specific school (ESTG- Technology and Management School).

In the next sections we will present the ESTG and the development process of the unit and the seven axes that are being proposed. These axes capture the different ways in which cooperating initiatives and practices between businesses/institutions and ESTG can occur. Critical factors to take into consideration for the success and improvement of the functioning of business-cooperation units will also be discussed through the paper.

2 ESTG (IPVC) and the Development of the Unit

ESTG is part of IPVC, one of the six existing schools in this Public Polytechnic, created in 1980. ESTG area of activity includes the three components of the so-called knowledge triangle:

- education – provides certified educational offer in different areas, at Professional (level 5), MSc and Master levels;
- research – research activities ranging from basic to applied research with an industry focus, concentrating on trans- and interdisciplinary areas with a strong innovation potential;
- innovation – ESTG aims at developing/reinforcing strong links with the business community to ensure that its work is appropriate for market needs, and its activities are oriented to make it as useful to the economy and the society as possible.

In order to achieve its goals, ESTG strengthens links with the productive sector, establishing partners involving companies, organizations and society as a whole, establishing partnerships, sharing objectives, planning and building together the scientific, educational, innovation and social integration design that make up the triple mission of a modern university. The strategic partners are organizations, across a range of sectors, that consider a cooperation with ESTG as a first order opportunity for the achievement of their social goals, as well as their research, development and innovation goals, and whose strengths and ambitions are in line with the School ones, to increase experience-based learning and employment opportunities for our students.

2.1 UBC at ESTG - opportunities and challenges

Over the last years, several initiatives have been put into practice by many of the teachers, namely extra-curricular training and project-based learning (PBL). Taking the academic year of 2016/2017 as example, and the initiatives that are of greater relevance for students skills and employability enhancement, it can be seen that a significant number of PBL, training programmes and entrepreneurship fostering initiatives has been implemented, involving more than 200 students.

Table 1 - Examples of UBC Initiatives at ESTG

Academic year 2016/2017	
Project-Based Learning (PBL)	75
Non-curricular training programmes	50
Curricular Training programmes	97
Entrepreneurship fostering initiatives	14

The Courses with greater involvement on UBC activities are Tourism, Management, Computer Engineering, and Civil Engineering. Some of the initiatives are of a multidisciplinary nature, involving teachers and students from different courses, or from the same course but different disciplines.

In spite of the number and relevance of those initiatives, it is believed the maximization of its full potential still requires a different level of organization and communication. In addition, and although many of these initiatives

are framed by protocols have been signed between ESTG and several organisations, some of these protocols do not have a specific focus. Opportunities for growth exist, namely with alumni that are local and regional entrepreneurs, or in management positions. It is also believed that partnerships should be more precisely defined, towards a more effective cooperation, with measurable and sustained results. Probably due to the lack of a common understanding of what can be the organizational strategic guidelines and directives regarding these issues, associated to a lack of an organisational structure that ensures resources either human or facilities, there is still work to be done. Providing conditions in order to facilitate the integration of students in the professional context, through practical job placements is often a way of promoting UBC. At ESTG (and other schools from IPVC have already replicated the event) there is already “Emprego IPVC”, organized by the student board, aiming at strengthening the articulation between students and the labour market, through the identification of potential job placements and helping businesses to select/recruit the students with the adequate skills. Also this year, IPVC developed the first Job Fair, increasing the institution external communication of resources, abilities and potentials, and establishing new partnerships with different business partners. Another initiative is the creation of a Junior Enterprise at ESTG, a non-profit organization, formed and managed exclusively by students, developing projects, in their study fields, for companies. This initiative intends also to strengthen UBC, and enable students to apply their theoretical knowledge on practice, developing their entrepreneurial skills by running the organization and benefiting from the guidance of teachers and professionals. Junior Enterprises are similar to real companies, counting with the principles of corporate governance like management council and executive board. This possibility has already been discussed with representatives of JADE – European Confederation of Junior Enterprises and Jade Portugal, and it is an on-going process.

3 Operationalization of UBC at ESTG

Considering all that is already being done, and the possibilities ahead, it was considered that cooperation initiatives should be more structured, and a Unit proposed with a clear market driven approach, whose main objective is to proactively facilitate the relationship between organizations and the School (ESTG) based on a continuous relationship through a personalized dialogue. Considering Plewa et al. (2012) and the relevance of the external communication, all the disperse information is combined on a platform, providing all stakeholders with the portfolio and the different ways in which cooperating initiatives and practices between organisations and ESTG can occur. It is expected that the information made available will contribute to enhance cooperation, but most of all, it will work as a showcase of the possible / alternative ways of UBC available at ESTG.

3.1 Similar UBC (Benchmarking / cases studies)

To propose a structure for the Unit, several examples were analysed, namely of institutions providing similar services, but with higher organisational structure and communication platforms. In the European Commission reports (2014), several examples can be found, some of which referring to a context of SMEs, as is the case of ESTG. Some of those examples were considered as best practices and have informed/inspired the organisational structure and communication tools of UBC-ESTG, such as the University of Girona and the University of Wroclaw.

But despite these cases being inspiring and of the existing similarities, UBC at ESTG favours interdisciplinarity at a greater extent. Considering that ESTG hosts set of courses from different disciplinary areas, it is possible to create multidisciplinary teams that approach the projects and challenges of UBC in a holistic way. So it is possible that students from different courses, participate in the same project, at the same time or at subsequent moments.

3.2 Structural model of the UBC-ESTG unit

The structural model of the UBC unit at ESTG includes seven strategic axes, as presented on figure 1. These axes will be explained, in more detail, in the following subsections, with special emphasis being placed on

R+D+I, Training and Project Based Learning, as those that are considered of greater relevance in the development and enhancement of student's skills and employability, whilst contributing to regional social and economic development.

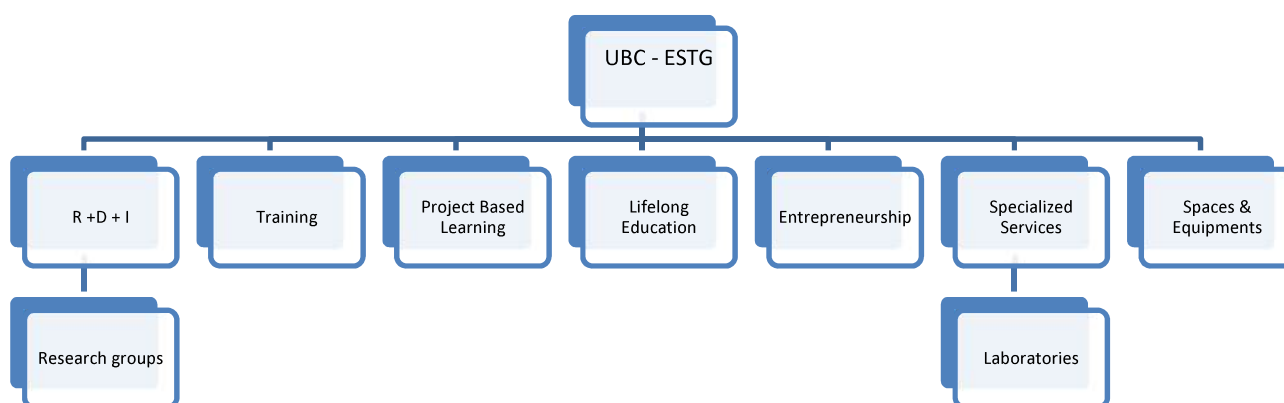


Figure 1: Structural model of the UBC-ESTG unit

3.2.1 R+D+I: Research Units

In the ESTG laboratories, and through collaborative initiatives, research projects or innovative technological solutions can be developed, without SME having to invest in sophisticated facilities and equipment or hire research personnel orienting it to the innovation needed. On the other hand, ESTG/IPVC has a wide experience in the participation of R & D projects in collaboration with companies and institutions, both at national and international level. In addition, master level students' research can be driven by a specific need of a private business or organisation. In a context of real challenge, master students learn to be more motivated and reach higher levels of satisfaction with their research, considering their work has meaningful and valuable to a greater extent.

3.2.2 In Businesses Training Programmes (Talent)

The objective of the training programmes is to allow students to apply and deepen knowledge in the context of their work, acquired through academic achievement. It is intended to promote its integration in the professional world, by providing them with a greater capacity for initiative and adaptation, contributing to high levels of motivation, creativity, flexibility, innovation, communication, organization and decision. Many of these training programmes are of a non-curricular nature, but have shown large scale adherence by students, which translates the value attributed to them as platforms for employability.

3.2.3 Project-Based Learning (PBL)

Project-Based Learning is a teaching method in which students gain knowledge and skills working over a long period of time investigating and responding to an authentic, engaging and complex question, problem or challenge (Christie & de Graff, 2017; Lima et al., 2017). It also seeks to increase the active participation of ESTG in the community, to strengthen and transform theoretical knowledge, to acquire knowledge in a real context, promoting the development of employability and key life skills for the professional and personal development of students.

The objective is to stimulate relations between the different courses available at ESTG, to develop and carry out the students' projects. The projects will be conducted within the curricular units and in close cooperation with the organizations involved, as happens in other HE Institutions, with great emphasis on PBL approaches and the link between university and industry (Dinis-Carvalho et al., 2017; Lima et al., 2015; Lima, Mesquita & Flores, 2014; Mesquita, Lima & Flores, 2013). A coordinator is assigned to each project who then analyses which curricular units can contribute to its problem-solving. After identifying the underlying challenges, the different teachers who integrate and / or have responsibility for PBL are included in the process.

One of the reasons for PBL being so much valued and adopted is associated with its importance for fostering interdisciplinary approaches and student motivation (Lima et al. 2007). Interdisciplinarity is a key feature of PBL at ESTG, as students need to relate different content areas and apply them to a broad scope of projects. Students are also challenged to deal with teamwork and project management, skills which enhance employability.

3.2.4 Lifelong Education and Training

In ESTG/IPVC, the articulation between education and training for life will promote the urban regeneration since people that are vital to future competitiveness of a region. The demand for personalized service jobs and interpersonal/communication skills increased the demand for highly skilled staff and talent. Engagement with higher education provides the skills for specialist, highly productive and well-paid work. Currently, for example, we developed a partnership with a leading pre-fabricated brick company, located at the Viana do Castelo Technology Incubator (VianaTech), and the employment center of Viana do Castelo to promote a training course in the area of BIM (Building Information Modeling) to re-qualify civil engineers and unemployed architects, complementing a lack of local and international workers with these abilities.

3.2.5 Entrepreneurship

The objective is to contribute to the development of initiatives that allow projects created by students (including hub 2) to be implemented jointly with partners. These initiatives can be translated through entrepreneurship competitions such as the contest "DNA Empreende com Gestão", "Poliempreende", and the mobilization of investment funds, venture capital, crowdfunding, among others. The project of creating a Junior Enterprise at ESTG is in accordance with this stance.

3.2.6 Specialized services to the community

Providing specialized services to the community is a key vehicle for bringing the ESTG and IPVC closer to the surrounding community, through research and technological development. In this context, the work developed by Innovation and Knowledge Transfer Bureau (OTIC) is of great significance, as this Unit constitutes plays the role that is designated, in the business world, as the commercial role. In fact, among other tasks, OTIC is responsible for establishing contacts with potential clients, identifying their needs and articulate the creation of internal teams. OTIC is also responsible for monitoring these R&D processes to ensure clients final satisfaction, it is important to adapt the "academic timings" to the "business timings", ensuring an effective and efficient response capacity. The increase in the volume of rendered services will include the institutional capacity to strengthen the relationship with organisations throughout more regular contacts and the establishment of a follow-up process. ESTG is already involved in an extensive set of activities of knowledge transfer and support to the community. This is achieved through research groups from the various scientific areas of this school, as well as by its Laboratories directed to the provision of services to the community, in areas as diverse as the environment, civil engineering and food.

3.2.7 Spaces & Equipments

Although ESTG / IPVC] has a modern and functional set of equipment, classrooms and amphitheatres, suitable for various types of events (Seminars, Courses, Workshops, Meetings, Exhibitions, Parties among others) that are available for renting or loan, on a permanent basis, or sporadically, for specific occasions. The underlying conditions (renting or loan) are associated with the profile of the organisations requesting access to equipment and spaces and dependent on the relationship established between them and the School. Quite often facilities are provided without associated costs, materializing the principle of social responsibility and contribution to local development.

4 Conclusion

This paper presents a brief contextualization and diagnosis of the state of the art of different organizational strengths and opportunities at ESTG-IPVC that sustain the creation and development of a strategic school unit,

working exclusively on the university-business cooperation. There are several ungrouped initiatives that can be organized and therefore improved, increasing the strategic public positioning of this Polytechnic School. The organisation of working groups, and the identification of a team leader responsible for each area, as well as the creation of marketing tools that provide available information about these thematic areas, will be crucial for the increase of collaborative initiatives and for organisations' acknowledgement about ESTG as a strategic partner. For the academy, this paper intends to explore and discuss the practical challenges found in the operationalization of UBC, contributing to the literature as a contextualized example that describes the rationale and conditions underlying its development process.

With a focus on continuous improvement, not only a series of additional initiatives are being considered, but also assessment procedures are being put into practice at ESTG, to understand the real impact of the UBC unit in specific, and of UBC initiatives to students, teachers and professionals. It is expected future work will include and discuss assessment results.

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