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DECONSTRUCTING THE BARRIERS OF THOUGHT – THE NEED FOR EMBEDDEDNESS OF EDUCATION AND BUSINESS

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Abstract: The need to match education and business goals is an endeavour and a challenge for any educational institution, especially for higher education institutions. This challenge has become an important focus over the last decades due to the claimed relationship between education and innovation as well as the potential for economic development. The biggest challenge seems to be to overcome the barriers of thought and objectives that exist between the two worlds of education and business. Indeed, although many attempts and programmes are being developed almost all over the world to bridge these two realities, many clashes and disillusions exist. For different reasons, this issue is viewed almost exclusively from the academic perspective, with the entrepreneurial perspective being completely absent. Based on the experience of both the academic and business worlds, the authors commence this contribution by analysing the causes of this mismatch of interests. They conclude by presenting some possible solutions for improving this misalignment.

Keywords: education and business, education for innovation, entrepreneurship, active learning, economic development, knowledge transfer.

1. Introduction

In a very narrow sense, the academic world (i.e., universities) and the business world share neither the same aims and interests nor the same *modus cogitandi* or *modus operandi* (Demain, 2001). The academic world wants to build generic models that can help address multiple similar issues. For this purpose, it is necessary to examine the context. On the other hand, businesses aim to solve problems in a simple, quick and cheap way and very often it creates a difficulty in understanding the context between the people of these two worlds (Wallin, et al, 2014). Therefore, to bridge the gap between the academic and the business world, an in-depth

knowledge of each particular context is needed, and each problem should be addressed as unique, albeit not disconnected from more comprehensive frameworks.

The problem is that examining the context can preclude addressing certain particularities. However, if only particularities are considered, then integration and sustainable and flexible solutions will be hard to achieve. In many cases, successful interactions between the academia and business rely on interpersonal relations on both sides (Demain, 2001). The academia-business partnership seems to be particularly effective when it is based on a network of institutions that are developed around a strong core of interpersonal relations (Gomes, Lopes, 2010). Therefore, in order to match the aims of these two worlds, communication between them must be improved along with time management.

The European Union (EU) as well as individual states and regions regularly promote different funding programs and credit lines to enhance cooperation, innovation and knowledge transfer between universities and companies, such as the Horizon 2020 (University of Oxford, 2015). The Horizon 2020 programme is "in Europe, the largest multinational research programme in the world. The EU will invest around €80 billion in research and innovation projects between 2014 and 2020, many of which call for large scale, multi-partner, interdisciplinary research teams drawn from a number of countries within the EU and across the world" (University of Oxford, 2015). In the United States of America, the enactment of the Bayh-Dole Act in 1980 by Congress allowed universities and small businesses to own patents for research which had been federally sponsored (Demain, 2015). Funding for universities is increasingly dependent on collaboration with industry (University of Oxford, 2015). This compels both parties to meet, but not necessarily to understand each other, for, among other reasons, very different languages come into play: the academic language, the business language, and the institutional bureaucratic language of the donors. To make the process more effective, relationships must be established to create empathy, which implies quite complex time management.

Time management is a very important issue, both for the academic and the business world. As mentioned above, the academic world aims to understand the causes (reasons) underlying the occurrence of a certain phenomenon or a type of phenomenon. The deductive logical reasoning practiced by the academia tends to see the actual problem as being one of the possible ways of manifesting a certain type of phenomenon. On the other hand, business people desire to find the solutions for actual particular problems – as soon as possible (ASAP!). Furthermore, funding entities have specific timetables for specific calls. Lastly, students must adapt to a structured school calendar which includes fixed assessment periods and deadlines, in a context that discourages their desired involvement in joint projects. Matching all these calendars implies an understanding between academics and entrepreneurs regarding the contours of joint projects, and also constitutes a demanding exercise in adaptation to the strategic directives, rules, and calendars of the funding entities, and finally timetables of graduate and postgraduate students, as well as research fellows.

Indeed, the whole process may take place within universities, but entirely in parallel with the education system, through special project management departments, without any active participation of students or even research fellows.

As already referred to above, in many instances, the specific objectives of the partners also vary: academics desire to publish just for performance evaluation sake, with possibility to publish in high impact journals proportional to the originality of the theme presented and/or the methodology used. However, business people look for profit, even when generated from patent royalties (Demain, 2001), although most frequently they are looking for quick and effective solutions for the challenges they are currently facing, although neither the topic nor the methodology may be original. Both clients or funding entities, in turn, need evidence of accomplishment of goals and timelines of projects, mostly in the form of presentations at events, such as seminars, conferences and congresses, or partial publications which very often are activities that are time and resource consuming. Generally, yet again, students, especially undergraduate students, are completely absent from these bureaucratic and communication processes.

Due to these obvious differences in the objectives and the "languages", and also due to the difficulties in managing time and communication processes between universities and companies, existence of mediators seems to be a very interesting solution. The mediators, who dominate the various languages of the players (academic, business, and bureaucratic/financial "dialects") take up the role of consultants. It seems, indeed, that nowadays, universities and companies are more often using consulting expertise to prepare dossiers to apply for project funding by government or European agencies. However, large consulting companies, usually multinational, tend to specialise in certain areas of business activity, and are, thus, limited for the use of specific models as most are protected by patents and trademarks. More importantly, their services may be very expensive, thus discouraging their contraction for this propose.

On the other hand, it seems obvious that universities can provide business consulting services in a more flexible and cost-effective way, encompassing more differentiated areas of the economy, and, preferably, integrating students in the process. This integration could help students acquire better knowledge of the dynamics of the business world, in the field of the respective educational course, at least from the outset of their education process.

This early integration of students in the matching process between universities and business goals seems to be a clear answer for solving the mismatches referred to above, and would additionally contribute to addressing the pedagogical problems of the "vocational crisis" that the higher education system is facing during the first decades of the 21st century. Very frequently, this problem is only being addressed through the introduction of entrepreneurship syllabi or disciplines in the course curricula, which is clearly insufficient. Generally, students remain exclusively within the university, carrying out their studies on the basis of hypothetical cases or they receive theoretical support for ideas which are very often completely detached

from the specific context of the market, and disregard the most important problem of communication between the university and the business world.

The introduction of new student-centred, active learning approaches, such as Project- Based Learning (PjBL) (Hamer, 2014) from the early stages of the higher education process, or even earlier, combined with entrepreneurship contents and strong interaction with local companies, seems to be a more effective and stimulating response to the desired rapprochment between the academic and the business worlds, simultaneously improving the competence and employability of the future professionals and the competitiveness of companies.

2. Attempting to match education and business

The shift of *focus* from a learning system cloistered in the walls of the university to another, more dynamic system, which is attentive to the permanent changes in the world and the associated community that demands changes in the ways that higher education institutions are managed, especially regarding the performance evaluation system of teacher and assistant bodies.

Definitively, the maxim "publish or perish" must be replaced by another: "create value for your community or perish". This means that assessment systems of university teaching and research performance should, perhaps, be elevated to a higher level of joint consulting activities of teachers and students, for instance through PjBL projects, as well as actions to support the creation and development of "start-ups" or others that contribute to the establishment and enhancement of networks of local companies, research centres, Higher Education Institutions (HEIs), charities, and local and regional government entities.

Much of the effort undertaken to bridge the gap between the academia and business is being addressed particularly through the so-called "academic entrepreneurship", i.e., the embedment of entrepreneurial thinking and practices in teaching, research, and administration in various universities around the world (Nyeko, Sing, 2015; Siegel, Wright, 2015). It is known as the "academic revolution" or universities' "third mission", in the case of which, in addition to teaching and research, various types of universities have emerged, such as research universities, technological universities, teaching universities, hybrid universities, and, of late, entrepreneurial universities (Nyeko, Sing, 2015; Giancarlo, Squazzoni, 2007).

In some circles, academic entrepreneurship is understood as business development activities of universities and other HEIs, which include licensing, patenting, and creating start-ups (Siegel, Wright, 2015). The growth of the academic entrepreneurship has been observed in many countries in North America, Europe, and Asia, ever since the establishment of the first technology transfer offices at universities in the 1980s and 1990s. Especially in the public university system, academic entrepreneurship has been triggered in the recent years by budget

cuts by government and research council funding across Europe, and, consequently, by the need to encounter alternative fundings by the universities themselves (University of Oxford, 2015; Harmer, 2014).

Academic entrepreneurship can involve different types of entrepreneurial activities, leading to classification of academics based on the types of activities they are engaged in (Nyeko, Sing, 2015), such as: an academic entrepreneur (mostly external teaching activities), an entrepreneurial academic (teaching and research related activities), and an academic-entrepreneur (company-related activities).

The move towards the applied research, quantifiable impact, and academic-business partnership is not free from criticism and concerns. In fact, some transparency organisations and academics have expressed fear that corporate interests are beginning to direct research and teaching at HEIs (University of Oxford, 2015). Several charities and NGOs, both in Europe and in the USA, have also expressed concern regarding the influence of corporate donations and joint research programmes on academic research.

Another aspect of the relationship between the academia and business is entrepreneurship education. Indeed, entrepreneurship education is already established in the syllabi or as an independent discipline in the curricula of different courses in a variety of HEIs, and a significant increase has been observed in recent years (Raposo, Paço, 2011; Lakéus, Lundqvist, Williams, 2013; Lakéus, 2015). This increase is related to the general acceptance of the importance of entrepreneurship for economic development and competitiveness (Kolstad, Wiig, 2015; Dragomir, Pânzaru, 2015). Entrepreneurs are believed to drive innovation by speeding up the structural changes in the economy and forcing well-established companies to improve, and thereby they contribute indirectly to increasing productivity (Raposo, Paço, 2011; Sluis, Praag, Vijverberg, 2004). There are many societal advantages to be gained from instilling entrepreneurship in education, such as economic growth, job creation, and increased resilience, while at an individual level, the following effects need to be highlighted: individual growth, increased school involvement, and promotion of greater equity of starting points (Lakéus, 2015).

However, academic entrepreneurship and entrepreneurship education are insufficient to bridge the gap between the academic and the business world. Academic entrepreneurship is mainly carried out by faculty and postgraduate students and researchers, with undergraduate students being virtually excluded from the process. Similarly, entrepreneurship education rarely engages students in the solution of specific real-world problems which, at best, are based on decontextualised case studies or unlikely simulations of "real cases".

In this context, new pedagogical approaches, such as Project-Based Learning (PjBL) can be an extraordinary instrument for promoting the links between the academia and the business activities, especially at the local level. In fact, PjBL is an active learning and student-centred pedagogical approach, based on the development of a project designed to solve real world problems (Harmer, 2014). The key features of the PjBL approach are: learning by doing;

working with real life problems; the teacher is seen to be a facilitator, a mentor, or a "guide-on-the-side"; interdisciplinarity; collaboration and group work, and; production of a significant "end product", i.e., a "product" that creates effective value for the community (Harmer, 2014).

The fact that the problem that drives the project and the learning process has to come from the real world creates a huge opportunity for cooperation between HEIs and local companies, small businesses, and other institutions. Local or national business can naturally be a major source of real problems of pedagogical relevance which can be used as a subject for analysis within the PjBL process.

On the other hand, through the development of this type of projects, both students and HEIs can gain a better insight into the job market and the type of problems that a given sector may be facing at present, or may face in the future. This certainly contributes to reinforcing the links between the academia and the local businesses, and simultaneously improves employability and the entrepreneurial abilities of students as this type of project generally includes an entrepreneurship education component (Heikkinen, 2014).

This type of link can help a HEI improve its academic entrepreneurship through the design of better courses and consulting and research services which are to a larger extent related with its surrounding economic and social environment. Evidently, the business sector partner benefits from students and the HEI having a superior knowledge of the specific market which simultaneously facilitates the selection and recruitment process by potential employers.

Implementation of PjBL and similar approaches, such as Problem Based Learning, was first introduced in Canada for a degree in medicine course, but quickly spread to Europe and the rest of the world; those approaches are now an integral part of a large number and types of courses or disciplines that range from engineering through to management and social sciences, including education and environmental sciences and law (Harmer, 2014; Davies, de Graaf and Kolmos, 2011).

Adoption of PjBL in HEIs occurred as a response to the perceived need for university graduates to be equipped with relevant skills as future employees, and was requested by government, industry, and professional accreditation bodies, as well as students themselves – as they are facing a highly competitive job market. The main advantages of PjBL include: claims of improved academic results, development of broader skills, increased student motivation and enjoyment, enhanced outreach and engagement beyond academia, and advantages for teachers (Harmer, 2014). It is specifically claimed that the PjBL approach helps improve the skills required for the 21st century, such as: self-learning ability; problem-solving skills; communication skills (oral and written); critical, active, and creative/innovative thinking; interpersonal skills and social relations; team work/collaboration (intra and interdisciplinary); data analysis abilities; project management, and; ethical, social, and environmental awareness, among others (Harmer, 2014; Noordin, 2014; Rodrigues *et al.*, 2015).

The PjBL methodology is being used to align the academic world with the business world in different countries around the world. For instance, in Taiwan, a project for the design and construction of a boat was developed at a HEI in response to the shortage of skilled boat builders, and, in South Africa, a business studies project was created partly to help meet the need for more trained entrepreneurs (Harmer, 2014).

3. An example of the Academia-Business link – the GoFigo project

In 2015, the Portuguese government launched a large PDR2020 programme to fund innovation in the field of agriculture and forestry as part of the Horizon 2020 programme. In the context of this programme, Operational Groups (OG) were to be created, with the explicit objective of actively contributing to overcoming the evident "difficulties in transforming knowledge into innovation that leads to sustainable growth and efficient use and protection of natural resources and biodiversity. Most of the barriers that condition this process were identified, namely lack of convergence between the knowledge produced and the needs of the producers as well as unavailability of producers' access to the knowledge produced." (Ministério da Agricultura e do Mar, 2015). An Operational Group is a formal partnership between agricultural producers, universities, research centers, and development associations, with the common objective to identify particular problems and develop solutions for them.

Torres Novas is a region situated about 100 km north of the capital, Lisbon (Figure 1), where fig production was one of the main sources of production up to the 1970s. The fig trees had been planted to replace the vineyards that had been decimated by the *phylloxera* pest which destroyed European wine production at the end of the 19th century. Most of the fig harvest was used for the production of alcohol, due to the high sugar content of the main cultivated variety – the Figo Preto de Torres Novas. The production of figs and their commercialisation was highly controlled by the state until the democratic revolution of 1974 and the subsequent adhesion to the European Union. Liberalisation of the market is associated with mass emigration to large urban centres that led to decline in fig production and abandonment of the orchards.

Figure 1. Map showing the localisation of the Torres Novas county, which is nearly in the centre of Portugal. Torres Novas. (2018, novembro 20). *Wikipédia, a enciclopédia livre*. Retrieved 17:39, novembro 20, 2018 from https://pt.wikipedia.org/w/index.php?title=Torres_Novas&oldid=53645840.

Ageing of the local population and lack of technical support prevented development and application of more modern and efficient fig production techniques. Valorisation of the product through creating a designation of origin did not help either. All of it led to reduction in the value of the product on the market and disinterest in growing this fruit.

Several attempts were made over the years to revitalise fig growing, but they were not successful, until, in 2015, a small group of growers and fruit processors was formed; the group members were connected by strong interpersonal relationships and the will to contribute to the development of the local area, and initiated the design of a strategy that culminated in the formation of a the GoFigo operational group.

GoFigo is comprised of producers and members of universities and agricultural research institutions, and is formally and legally constituted with the aim of improving fig growing techniques to produce fruit with better quality and a higher market value.

GoFigo is a platform of communication between academia, agribusiness, local government, and development associations who all work together to find solutions for real problems as well as integrate university graduates, with a vast potential for the future integration of undergraduate student projects (Figure 2). Although the process is still in its infancy, the fundamental principles are already present, namely: interdisciplinarity, cross-communication, integration of various social players with a common objective – all of which create a context for mutual learning that overcomes the barriers of thought.

Figure 2. Poster announcing the first Open Day of GoFigo which brought together all partners and stakeholders of the project.

For these barriers lead to the conditioning of thought and creativity, and have contributed to creating a monopoly of the *episteme* and of the business fabric (*praxis)* which is detached from the theory and the creative process of *poiesis*. By revisiting (and simplifying) Aristotle's Nicomachean Ethics (Aristotle, 1906), we propose to schematise this transformation of relation between knowledge categories, from linear succession to cross-fertilization between various "stages" of the thought process (Figure 3).

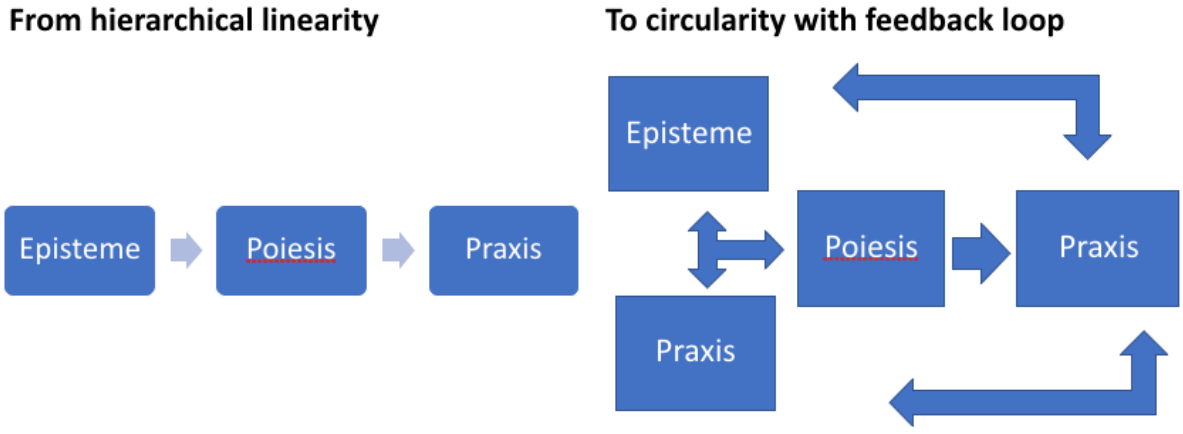

Figure 3. Schematic representation that opposes a linear idea of theoretical construction as a base of creativity, and effective action as a scheme for systematic cross-fertilization.

4. Conclusion

Indisputably, the interaction between the academia and business is the key to transformation of knowledge into innovation, which, in turn, can lead to sustainable growth and efficient use and protection of natural resources and biodiversity. However, this interaction is very difficult to establish, as languages, ways of thinking and operating, and the goals of these two realities do not often converge.

To improve the effectiveness and efficiency of the partnership between the academic and the business world, the existing barriers of thought and objectives must firstly be overcome. Academic entrepreneurship and entrepreneurship education in HEIs can contribute to bridging the gap that separates HEIs from the business world, although generally only teachers, assistants, and post-graduate students are involved, which excludes undergraduate students from a learning process that could be important for their education.

New pedagogical approaches, such as Problem-Based or Project-Based Learning, appear to be a very interesting opportunity for HEIs to commence partnership with the business world earlier as these methodologies require interaction of students with project subjects that are based on real world problems, which is highly advantageous for all parties involved.

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