Managing Innovation in Higher Education

Christina Gasser Scotte* and Christopher Scotte**

Universities play a major role in developing graduates who will provide organizations with technical expertise and knowledge to help drive commercial success. Due to globalization forces, technological innovation, the advent of the Information Age and other factors, skills and ability requirements for undergraduate and postgraduate students are constantly changing. This requires universities to innovate in new ways to facilitate continual development and improvement in their curriculum, research output and service to the business community. However, higher education is falling behind in innovation and the gap between academia and industry is of growing concern. The aim of this paper is to contribute to the literature by reviewing the academic work from 1990 to date and identifying key themes which can contribute to further empirical studies regarding either step-by-step or radical innovation in higher education, as well as to provide research propositions which should be further investigated to help improve understanding and insight into this critical research area. After reviewing empirical and theoretical research, five key areas were identified which require further investigation: strategy, organizational culture, promotion of innovation champions, industry involvement in curriculum design, and implementation of technology within teaching pedagogy.

1. Introduction

In 1973, Zaltman, Duncan and Holbek argued that one key factor of business success is innovation. With the advent globalization and the creation of new technologies, many scholars are arguing that innovation is more important now than ever before. Innovation is the ability of an organization to improve product and services for the consumer or to improve system processes within an organization to enhance performance and create a competitive advantage in the marketplace (Hamel, 2000; West and Fair, 1990). These improvements to products/services or processes can occur in an incremental step-by-step improvement or through radical change. Step-by-step improvements can be the result of adjustments, enhancements or new functional improvements to external product/services or internal processes.

Radical change is the ability of an organization to find a completely new market and create a product or service to meet the needs of the market (Johne and Davies, 2000; Johne, 1999). Another name for radical innovation is blue ocean strategy (Kim and Maubourgne, 2005). Radical innovation from an internal systems perspective would be to completely re-engineer or create new systems or processes that have not existed before within your organization or even in the marketplace. The level of competition or turbulence in the marketplace will impact what strategy or series of innovation strategies an organization selects to compete in the marketplace.

*Christina Gasser Scotte – PhD Student, Department of Management Learning and Leadership, Lancaster University, UK. E-mail: c.gasser@lancaster.ac.uk
**Christopher Scotte – School of Logistics and Maritime Studies, Bahrain Polytechnic, Bahrain. Email: christopher.scotte@polytechnic.bh

Although the Information Age is in full swing, many higher education institutions are simply utilizing technology and its associated advantages for step-by-step improvements, rather than producing the radical change which may be possible. This paper examines the literature regarding innovation in higher education from 1990 to present; presenting five important areas of innovation which may help higher education institutions to produce either step-by-step or radical change. To date, there is a lack of literature regarding innovation in higher education, and a lack of empirical studies in particular. This theoretical work contributes to the literature by identifying these broad, strategic themes which can lead to further empirical work in higher education through the research propositions provided.

A broad literature search was conducted on innovation in higher education from 1990 to present, after which five larger themes for innovation were identified: strategy, organizational culture and innovation champions at the macro level; and teaching pedagogy and curriculum design at the micro level. These themes were then researched further for a more in-depth study of each theme and to create the research propositions. The paper commences with an introduction to innovation in higher education and then provides a more detailed review of current literature in the five key areas along with their associated research propositions in the following sections: section 2.1 on strategy, section 2.2 on organizational culture, section 2.3 on innovation champions, section 2.4 on industry involvement in curriculum design, and section 2.5 on technology implementation into teaching pedagogy.

2. Literature Review: Innovation Overview

Throughout history, higher education institutions have been extremely resistant to internally-driven innovation. One of the reasons for lack of innovation has been the types of funding that universities have received. The earliest higher education institutions such as Plato's Academy were funded by wealthy individuals, and this type of funding left universities relatively free of government control, allowing them to produce graduates who were predominately philosophical in their thinking without having to satisfy the demands of particular industries. In the Renaissance and Middle Ages, many universities were supported by the church, royalty, or even by tuition from the students; however this changed with the rise of the Industrial Age. In the l940s, the focus on industrialization initiated government grants to universities in order to produce graduates to satisfy the demands of emerging industries and contribute to national economic growth in the United States (Etzkowitz, Webster and Healey, 1998). This model has also been followed by many other industrialized countries. This change to government-provided funding has functioned to try to keep universities aligned with industry. However, Christiansen, Anthony and Roth (2004) have surmised that universities in general have now become government institutions and therefore it could be argued are not as motivated or as driven to be as innovative as private universities or corporations.

Another reason for lack of innovation has been the purpose and function of universities. For traditional universities, these were primarily to preserve and transmit knowledge to produce philosophers or future academics, and in the Industrial Age has been to

transmit knowledge from professors to students to produce a capable work force. In both cases of funding and purpose, impetuses for innovation were externally driven, and large-scale change took decades.

To further illustrate the sluggish pace of innovation in higher education, we can look at the *first* and *second academic revolutions*, so named by Etzkowitz and Webster (1998). They have traced when the research element was first introduced into universities to the late 19th and early 20th centuries, which they call the *first academic revolution*. They state that before the first academic revolution, not much research work was done in universities, but was mostly done at the homes of the interested scholars. The research revolution took on a life of its own in a few places, but it wasn't until the past few decades that it has really grown as more research was produced which contributed to the prestige of the universities in international circles, produced new innovations in science and technology, and produced innovations in industry. This growth has led to the second academic revolution, which they argue is the point at which research links between academia and industry evolved, with the help of government policies and funding, to the point where by the late 1980s university-industry-government funded research had become a factor in economic growth, both through knowledge flows to existing companies and as a source of new products and new companies. Research innovation and collaboration with industry has proven very lucrative to many universities, yet even still it took the better part of a century to spread throughout the higher education system, and even now it seems that only the upper echelon of universities are really taking advantage of the opportunities provided by this type of research.

As evidenced by the pace of innovation in research, one might expect the same timescale for other innovations within the higher education system. The relatively new external cause for innovation in higher education is technology. We use the term 'relatively' new because at present, society is roughly three decades into the Information age, and current university students are now referred to as the 'net generation' (Knight, Knight, Teghe, 2006; Tapscott, 1998). One example of how universities are adapting to the availability of technology is the advent of online education and online degree programs. In the last decade, improvements to technological platforms and access to many global residents has enabled many institutions to develop and deliver undergraduate and postgraduate courses through an online format (Obendhain and William, 2004; Marshall, 2007). Although universities are adapting in some ways to the abundance of technologies available, more research needs to be done on how universities can be truly innovative when it comes to technological implementation.

Technology is not only influencing the methods in which students can take courses. The fundamental type of knowledge that can be developed and shared in universities is also changing. Gibbons *et al.* (1994) has termed the type of knowledge taught by traditional universities *Mode 1* knowledge, stating that it was generally individually and academically created and easily transmitted to groups of students through lectures and books. They argue that a new type of knowledge is evolving, called *Mode 2* knowledge, which tends to be interdisciplinary, team-created, and having more varied and applied uses in the real world than Mode 1 knowledge. Of course, Mode 2 knowledge heavily

relies on the use of technology for its success, as new technologies allow and even encourage interdisciplinary, interinstitutional, and international communication of knowledge which has been impossible on a widespread scale until now.

Therefore, the evolution of technology which has advanced the evolution of knowledge, and the subsequent effects these two evolutions have on industry, have created an urgent need for innovation in universities that cannot be ignored. An evaluation of a broad spectrum of literature on innovation in higher education from both university and industry sources has uncovered a number of theories regarding how universities should innovate. These can be roughly divided into two arenas: a macro arena, which includes strategy, organizational culture and innovation champions; and a micro arena, which includes implementation of technology into teaching pedagogy and curriculum design within the classroom. This paper will discuss each of these areas and provide research proposals for each area which can contribute to the development of holistic innovation plans for higher education institutions.

2.1 Strategy

The direction of the organization plays a key role in identifying whether it will become a key player in the marketplace with regards to product/service innovation. Strategic goals identify the direction of the organization and take into consideration the resources that are available in implementing a futuristic plan. Innovation needs to be clearly identified and embedded in organization strategy for innovation to become a reality (Braxton & Eimers, 1996).

Higher education institutions are no exception to this rule. However, there are arguments as to what the purpose of higher education is, and finding this purpose will influence both the strategy and direction of higher education. While the main purpose behind universities can be argued philosophically, with some scholars such as Bennet (1990) arguing for a values-based perspective of higher education; even he admits that since the advent of the industrial age universities have largely been viewed from a functionalist viewpoint; as a means to conserve and transmit knowledge to the next generation of students with the intent of producing graduates who will contribute to the economy. Authors have argued increasingly in the last few decades that the university system has not innovated in tandem with industry (Bennis and O'Toole, 2005; Bouchikhi and Kimberly, 2001; Markides, 2007; Mintzberg, 2003; Phillips and Phillips, 1999; Schmotter 2000), and that universities are still teaching as if it were the Industrial Age while the external environment has moved on to the Information Age and even now to the Knowledge Age.

Bennis and O'Toole (2005, p. 1) illustrate one of the main reasons why business schools are not innovating and providing graduates tailored to industry:

> Instead of measuring themselves in terms of the competencies of their graduates, or by how well their faculties understand important drivers of business performance, they measure themselves almost solely by the rigor of their scientific research.

The AACSB (2008) Task Force came to the same conclusion, stating that business school and faculty incentives place almost exclusive focus on academic research at the expense of practical research. This emphasis on scientific rigor largely divorces business schools from innovation related to the needs of industry. Markides (2007) explains this is for two reasons: relevant managerial research and rigorous scientific research require two completely different skill sets as well as different foci; with management research focusing on the next 'big idea' and academic research building careful arguments on pre-existing literature which they then support through data collection and analysis.

Much of the time, strategy takes too long to realise innovation in many organizations, and the reality is that universities need to innovate rather quickly to keep up with emerging technologies and the needs of industry. While organizations include innovation in their long term plans, Martinez and Wolverton (2009) argue that perhaps a more complex or focused strategy might be more reasonable to promote innovation. The AACSB (2008) Task Force suggested several strategic ways to bridge the gap between industry and practice, such as trying to create linkages between research and practice, strengthening interactions between practicing managers and academics, and requiring business schools to demonstrate the impact of faculty research beyond simply stating the number of refereed journal articles.
The research conducted to date suggests that:

RP1 Changing the evaluation criteria of a business school will improve the quality and speed of innovation.

RP2 A more flexible strategic process will improve innovation in higher education institutions.

2.2 Organizational Culture

Organizational culture is a collection of beliefs, norms, values, behaviours and actions that transpire within an organization. Organizational culture plays an important part in the innovation process due to the fact that if employees in an organization do not align with the values of innovation, it will be difficult for any organization to facilitate innovation (Obendhain and William, 2004). In higher education, universities are funded and evaluated mainly through research output, which facilitates an environment of alienation with other faculty and promotes suspicion and corporate subject tension (Bone and Bourner, 1998). Faculty in many instances will be more concerned with their involvement, participation and responsibilities with academics from other institutions and the business community than with their own department and university faculty (Winter, 1995).

A empirical study conducted by Obendhain and William (2004) identified that out of 1912 institutions in America, over 50% of the respondents showed behavioural traits that are evident in a clan culture. A clan culture is a culture that is representative of behavior that is inward looking and focuses on an internal operating environment. Cameron and Quinn (1999) came to the conclusion that an adhocracy culture is better

at promoting innovation at higher education institutions because this culture supports entrepreneurship, flexibility and risk to facilitate and drive innovation.
The research conducted to date suggests that:

RP3 An adhocracy culture promotes innovation in higher education.

2.3 Innovation Champions

Among the faculty and the university staff at large, it is necessary to have innovation champions. Innovation champions are members of the organization who are accepted and credible members of the organization; having the common-sense skills, interpersonal skills, and political intelligence to be effective agents for change (Armenakis, Harris and Field, 1999; Doyle, 2002; Markam, 2000; Pendleton, 2001). These people tend to bridge the gap between the macro strategic and organizational arenas and the micro curriculum design and pedagogical arenas within the classroom. Innovation champions are vital to drive innovation in both of these spheres, as they ardently promote innovation of current systems into new systems which can support new technologies, new knowledge, and provide graduates who can contribute fully to the evolution of the Information Age.

It is important to have innovation champions among the faculty because of the key role that faculty play in innovation in two major areas: curriculum design and methods of teaching, research and learning. First, faculty conduct research and apply this learning into their course design and structure, continually innovating the curricula for their courses. Second, faculty are the key members of staff who will integrate new methods of teaching, knowledge creation, and learning into their courses and research. Bates (2000) argued that any innovation in universities is completely dependent upon the support of the faculty because of their central role in university teaching and research. Surry and Land (2000) applied that idea to technology adoption, stating that the key role of the faculty in creating change is largely ignored in university-wide policies, thus most universities have not adopted new technologies.

It is also important to have innovation champions in the university administration and staff because they can play a key role in innovation at the macro level. Many university environments are static in nature, and encourage only minor enhancements in course design due to the complexity and difficulty of having new courses approved. In fact, according to research done by Porter *et al.* (2006), many universities even prohibit course innovation because they lack sufficient technology and policies to encourage and facilitate radical change in course design. Placing innovation champions in these areas can allow for innovation in previously stagnant environments.
The research conducted to date suggests that:

RP4 Recognizing and supporting innovation champions in both university faculty and staff will improve the creation of innovation in higher education.

2.4 Industry Involvement in Curriculum Design

There are many other scholars besides Bennis and O'Toole who argue that business schools are not meeting the needs of industry, and offer various explanations as to why that is. Another explanation for the poor performance of business schools in producing job-ready graduates comes from Mintzberg (2003), who has written many books on the subject. He argues that management is at once a science, an art, and a craft, and business schools are simply training the scientific part of the equation, leaving graduates unable to deal with the nuances of actually working in industry after graduation. Howell agrees, saying that business schools tend to turn out very theoretical-minded graduates, who generally make terrible managers, because they weren't actually trained to be managers and to deal with the messy issues they will come across in real life (Schmotter, 2000).

In addition to his analysis of managerial research versus academic research, Markides (2007) also stated that the gap between academia and industry is widening because many business school academics today have no actual experience in industry. This is due to the fact that it has become more important for business professors to have training in academic research than managerial research or experience. Markides suggests that the answer to this is to begin open innovation, where researchers will work on projects with non-academics.

These arguments of being too academically research-focused, not providing the practical or applied skills and abilities needed to perform in the workplace, and having academics who are unable to offer industry experience to students have led some scholars to suggest industry involvement in curriculum design as an answer. Some high profile universities such as MIT or Cambridge have been very successful in creating partnerships between their faculty, students, and industry; which have resulted in new products, new companies, and even more research opportunities. Other universities such as TROY, RPI and UNAM have created incubators where their students can do cooperative projects with industry (Etzkowitz & Webster, 1998).

It is apparent that more research needs to be done to either incorporate more practical skills into courses, provide work internships between university semesters, or find other means to put students into contexts where they can apply their knowledge.
The research conducted to date suggests that:

RP5 Industry involvement in curriculum design will lead to more skills-based knowledge transference, reducing the gap between the graduates produced by universities and the graduates required by industry.

2.5 Technology and Teaching Pedagogy

Today, technology in the classroom is used for two primary purposes: blended learning or distance education (Calvert, 2005). Technology can play a key role in changing the way courses are conducted if they are offered online, yet it may have much more to offer in achieving learning outcomes and objectives if fully integrated. However, one of

the main barriers to successful implementation of blended learning is that teachers do not want to change their teaching pedagogy (Anderson *et al.*, 2005).

Many scholars have studied barriers to technological implementation in the classroom. Building upon Watzlawick, Weakland and Fisch's (1974) concepts of first-order and second-order change, Brickner (1995) differentiated between first-order and second-order barriers to technological implementation. First-order barriers are those which are external to teachers, such as access to computers and software, and university policy barriers. Second-order barriers are those which are internal to teachers, and a review of twelve qualitative and quantitative higher education studies from 1999-2011 has advanced the following five second-order barriers: lack of technological skills and knowledge, lack of integration knowledge, lack of vision of the benefits or purpose of using technology, lack of pedagogical knowledge, professional attitude, and lack of motivation (Adi and Gasser Scotte, 2012).

Until now, most university policies have focused on reducing first-order barriers. Fisher, Dwyer, and Yokam (1996) postulate the reason being that first-order barriers are relatively easy to quantify and overcome. However, new research has been emerging within the past ten years which indicates that second-order barriers may be more important than first-order barriers when it comes to the actual utilization of technology in the classroom. After all, as a report from the EDC (1996) stated, simply having access to technology in the classroom does not cause learning; and it is by applying time, motivation and knowledge that technology in the classroom can be successfully implemented (Salmon, 2005). This means we must encourage the teachers themselves to overcome these barriers and include technology in the classroom.
The research conducted to date suggests that:

RP6 Removing second-order barriers will improve the implementation of technology in teaching pedagogy.

3. Conclusion

The aim of this paper was to conduct a review of the literature from 1990 to present with regards to innovation in higher education and identify some propositions for future empirical research which may help lead to plans for step-by-step or radical innovations in higher education. Based on a review of the empirical and theoretical research to date, five key areas of innovation for higher education were identified and research propositions were created. The five areas identified fall roughly into two categories: macro areas including strategy, organization culture and innovation champions; and micro categories including industry involvement in curriculum design and implementation of technology into teaching pedagogy being largely internal to the classroom. In each innovation area, at least one proposition for further research was identified. This may lay the foundation for future research by other academics as well as the authors to help contribute to this very important literature area.

Increased competition, the current evolutions of industry, technology knowledge, and best practice are just a few important reasons why innovation is vital for all higher

education institutions. Universities must innovate to close the gap between academia and industry; and begin providing graduates that meet and exceed industry requirements. If universities do not meet industry needs, organizations may take it upon themselves to provide their own forms of higher education, or students may begin seeking other educational opportunities, which may alter the university landscape permanently in the future.

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