

CROSS-DISCIPLINARY ENTREPRENEURSHIP FOR HIGHER EDUCATION WORLDWIDE

Dianne H.B. Welsh

The University of North Carolina at Greensboro

E-mail: dhwelsh@uncg.edu

Abstract

This paper specifically answers the call to address solutions to the lack of understanding of the nature of business and entrepreneurship by academics and the inadequate general business climate that results, in part, by the lack of leadership in preparing graduates in entrepreneurial ventures. The paper posits that a strong foundation in cross-disciplinary entrepreneurship is first necessary for innovation and commercialization to flourish. The paper begins by summarizing the basis for developing a strong, cross-disciplinary entrepreneurship program within the university. The University of North Carolina at Greensboro launched a cross-disciplinary program that has been a catalyst to launch new ventures, now in its sixth year with 48 courses in 26 departments/programs, which is discussed in *Creative Cross-Disciplinary Entrepreneurship: A Practical Guide to a Cross-Campus Program* (Palgrave-MacMillan 2014). The paper concludes by offering how cross-disciplinary academic programs inside the university leads to fruitful external private/public partnerships. Implications for Vietnam and developing countries are discussed.

Keywords: cross-disciplinary entrepreneurship, cross campus entrepreneurship, economic development

JEL Classification: I23; M10; M13

Introduction

Universities are becoming more entrepreneurial (Mowery et al. 2004; Siegel 2006) but must first develop a strong curriculum inside the university that spawns entrepreneurs, which will lead to innovation and commercialization opportunities through internal/external partnerships. First, an entrepreneurial mindset and skillset must be implemented throughout campus at all levels –administration, faculty, and staff- for students to learn and flourish in an entrepreneurial environment. The changing role of the university in economic development as an active participant has spurred universities to develop new kinds of learning by aligning curricula more closely with the needs of the workforce. Students today “want a job-focused education,” according to a recent article by Justin Pope of The Associated Press (2012). Entrepreneurship education is the sweet spot.

Entrepreneurship has revolutionized all aspects of business. Educational institutions have responded to the changing nature of business through curriculum innovation that emphasizes the knowledge and skills students need to start and grow entrepreneurial

ventures. For instance, new courses on sustainability, international entrepreneurship, and social entrepreneurship are becoming more prevalent and usually include an experiential “hands-on” project with the community or businesses. A university entrepreneurship program has the potential to impact economic development by developing new kinds of learning. By aligning the curricula more closely with the needs of the region, state, university entrepreneurship programs can impact economic development through resourceful graduates and knowledge transfer between the university and the region. Curricula must be built on a strong foundation of entrepreneurship research, which contributes to advancing knowledge to meet the demands of an ever-changing world. We must offer educational programs that prepare students to successfully launch entrepreneurial ventures in a global economy, and supports economic development by producing graduates that are globally ready by equipping them with entrepreneurship knowledge and skills for the 21st Century.

Entrepreneurship is a “process of exploiting opportunities that exist in the environment or that are created through innovation in an attempt to create value” (Brown & Ulijin 2004, p. 5). Entrepreneurship simply put is the ability to recognize if an idea is really an opportunity and then to take action, to do something about it that creates an advantage, or fills a need. Entrepreneurship is increasingly cited as a critical success factor in launching and growing innovative companies. Students should have the opportunity to be provided with a foundation in Entrepreneurship and then choose a cross-disciplinary specialization in Entrepreneurship.

"Twenty years ago students who dared to say they wanted to start their own companies would be sent for counseling," says Jerome Katz, a professor of management at St. Louis University, who has studied the trend. "Today, entrepreneurship is the fastest-growing course of study on campuses nationwide" (http://money.cnn.com/magazines/fsb/fsb_archive/2006/03/01/8370301/). The American Association of Collegiate Schools of Business (AACSB) reiterates that Entrepreneurship is the fastest growing major in the history of collegiate schools of business worldwide.

If universities are to grow generations of entrepreneurs that will impact science, technology, and innovation, cross-disciplinary entrepreneurship curriculum must first exist to grow innovation and commercialization inside the university that can translate to job creation outside the university. Entrepreneurship knowledge students learn in the classroom can be applied in laboratories or outside businesses through internships. These types of programs serve as a real world training ground for students. According to the April 2010 report by The Science Coalition (www.sciencecoalition.org), universities conduct the majority of the basic research in the United States. While U.S. universities conduct 55 percent of the basic research, the private sector conducts less than 20 percent (National Science Foundation 2010). These basic research labs provide a training ground for future entrepreneurs to launch entrepreneurial ventures. We all know that basic research is the building block of innovation and commercialization. Innovation developed at universities when commercialized have a higher success rate than research that does not, and spur jobs that are higher paying and have a net effect of permanently increasing economic activity. University research produces the next generation of entrepreneurs, and it is essential that the doctors, engineers, teachers, and scientists are trained with an entrepreneurial mindset and skillset- a skillset that sees the commercialization potential of new discoveries, inventions, and creative methods. Link and Welsh (2013) found specific characteristics that help young inventors launch businesses in their study of MIT graduates Without a cross-

disciplinary, comprehensive entrepreneurship curriculum in place, this will occur much less frequently. So how does a comprehensive, cross-disciplinary entrepreneurship program evolve?

1. Developing a Successful Cross-Disciplinary Program

A successful cross-disciplinary entrepreneurship program can be defined as a program that is supported at all levels of the university that includes on-going communication between the faculty, staff, students, and administration with a focus on producing graduates that apply entrepreneurship knowledge and skills to their particular chosen field to create or contribute to a successful entrepreneurial venture. Before a cross-disciplinary entrepreneurship program is put in place that has the potential to succeed, there must be two essential components: a re-orientation of priorities, both at the national and university levels, and incentives available at all levels to support the program. It is essential to incentivize professors to learn about the field of entrepreneurship and to understand how it applies to their discipline. This is essential for curricula development and teaching. In a truly cross-disciplinary course, the course objectives must encompass the discipline as well as how it is applied to entrepreneurship. Assignments or projects then meet these course learning objectives and are essential for assessment of student learning. The administration must believe and act to support entrepreneurship at all levels. The President or Chancellor, Provost, and Deans must fully support cross-disciplinary entrepreneurship or the faculty will not venture into this new paradigm. This starts with a university-wide committee to begin the process of establishing entrepreneurship across the curriculum through faculty training, campus-wide seminars, and speakers. Catalysts in every school and department have to be identified. A rich basis for the program's overall educational objectives must be developed that reflects how entrepreneurship is interpreted and applied at a particular institution of higher learning with its unique qualities and specialties.

In addition, there must be student demand, societal need, differentiation from other programs, an analysis of how it will complement other programs, an assessment of competitive programs in the area, comparison to nationwide programs (if in existence), consultation with other program directors, internal statistics on student interest or previous minors or concentrations, and consultation and collaboration with professional organizations. While these will vary depending on location, emphasis, and interest, international organization examples include the Global Consortium of Entrepreneurship Center Directors' Association, the International Council of Small Business (ICSB), The Tech Transfer Society, the U.N. Economic Commission for Europe, among others.

The Case of the University of North Carolina at Greensboro

The foundation of an entrepreneurship program must be first established with campus-wide input through objectives. The educational objectives for the Entrepreneurship program at The University of North Carolina at Greensboro (UNCG) are the following. Students will be able to:

- Analyze how Entrepreneurship is applied through an interdisciplinary approach.
- Incorporate creative and innovative thinking into entrepreneurial behavior and action.
- Identify and evaluate ideas to determine opportunities through feasibility analysis.
- Develop potential opportunities for action through a business plan.

- Evaluate the financial health of the business, including cash flow and the relationship between other limited resources, in order to prepare a financial forecast.
- Communicate entrepreneurial findings effectively, both orally and in written form.
- Apply the business core and Entrepreneurship knowledge and skills in a capstone experiential learning opportunity.

At The University of North Carolina Greensboro, students achieve these educational objectives at the undergraduate and graduate levels by choosing a profile based on one of eight Entrepreneurship areas specified for our region, university milestones and excellence areas, and history and culture of the university: Creative Industries Entrepreneurship, Education Entrepreneurship, Family Business, Franchising and Direct Selling, Health Care Entrepreneurship, Science, Technology, and Innovation Entrepreneurship, International Entrepreneurship, and Social Entrepreneurship. These profiles were determined from analyses of employment opportunities for the next 20 years, what the region excels in, and the courses that were in existence based on our university areas of excellence.

The undergraduate major of 21 hours is based on the seven profiles and includes a required capstone Entrepreneurship internship experience or a personal selling internship. Majors also have the opportunity to take elective courses in other profiles. In addition, the foundation Entrepreneurship coursework is open to other majors in the business school as well as any major on campus wishing to double major or minor in Entrepreneurship. Core courses in the undergraduate major and minor include a course in Creativity, Innovation, and Vision, Feasibility Analysis, Business Plans, Entrepreneurial Finance (one upper division class for majors, a lower level class is required for non-business minors, business minors are exempt since they are required to complete a year of Accounting and a semester of Finance), and an internship.

The graduate program has courses ranging from Feasibility Analysis and Business Plan to Organizational Entrepreneurship. Organizational Entrepreneurship focuses on how to be creative and innovative in a for-profit or not-for-profit organization that includes an assessment of an organization's current level of innovation among its employees and an in-depth analysis of how to move the organization's innovation capacity to the next level. Many students usually take both Entrepreneurship and Corporate Entrepreneurship. Health Care Entrepreneurship and Science, Technology, and Innovation Entrepreneurship have the largest growth in student offerings. Two graduate courses in Health Care Entrepreneurship have been added: Entrepreneurship Opportunities in Healthy Aging is being offered by the Gerontology and Kinesiology Departments; and Promoting and Practicing Health through Entrepreneurship from the Public Health Department, in which students write an SBIR grant. Entrepreneurship for the Sciences is being offered by the Department of Chemistry (Science, Technology, and Innovation area). All of these courses carry the ENT (Entrepreneurship) prefix. We have also applied for a National Science Foundation grant to blend entrepreneurship with STEM disciplines across campus.

Classes in Creative Industries Entrepreneurship include classes from Theatre, Dance, Music, Media Studies, English, Interior Design, and Apparel and Design. Family Business Entrepreneurship includes classes from Business Administration as well as Hospitality and Tourism. Health Care Entrepreneurship has classes from Business Administration, Information Systems, Kinesiology, Counseling Education, and Public Health Education. Science, Technology, and Innovation Entrepreneurship include classes from Chemistry,

Economics, and Information Systems. Social Entrepreneurship draws from Political Science, Communications, Business Administration, and Women and Gender Studies. Finance also delivers core courses in the program. Each course has learning objectives in the specific discipline as well as learning objectives in Entrepreneurship. This unique, applied aspect is critical for the program's success. We blend the particular discipline with Entrepreneurship in a course that results in a unique pedagogy that is application oriented. By teaching practical applications in the classroom, graduates emerge that are able to apply entrepreneurship skills to their profession immediately.

In addition to our program's cross-disciplinary nature, there is also a multifaceted nature of Entrepreneurship that is embedded within the curriculum's courses. The vast majority of programs in the United States focus on private-sector Entrepreneurship. Our program will also focus on Public-Sector Entrepreneurship and Social Entrepreneurship, where Social Entrepreneurship is viewed within the intersection between Private and Public Entrepreneurship. This answers the call to educate students in Entrepreneurship in the for-profit sector as well as the non-profit, public sector. Many non-profits support their mission by having a for-profit arm (i.e., Goodwill Industries' mission is to assist individuals to become employable by operating for-profit retail stores).

2. Establishing an Environment for Implementation

There are many special features that made UNCG a desirable, unique, and appropriate place to initiate such an innovative degree program. First, UNCG has a very successful cross-campus Entrepreneurship program initiated in 2007 called BELL (Building Entrepreneurial Learning for Life). BELL is a campus-wide, interdisciplinary effort, coordinated by an Executive Committee of deans and the vice-chancellor and faculty Advisory Committee that met periodically with the Executive Committee to provide input and suggest new directions. BELL had sponsored course and program development with incentives. Second, the business school has excellent placement of students through good relationships with area businesses. We built on this foundation to establish a unique entrepreneurial internship program that targets the following industry clusters: healthcare and biotech, logistics, wholesale trade, finance and insurance, food processing, and the arts. The internship includes shadowing an entrepreneur and specific matched projects agreed upon by the business and student with approval and oversight by the faculty internship coordinator. We recently began a program where we place Entrepreneurship interns in area businesses and the business pays ½ of minimum wage and a combined scholarship fund set up by the business school and the chamber of commerce. Third, the regional area was ripe for Entrepreneurship.

The campus library must be willing to commit significant financial resources to support the challenging research needs of entrepreneurship students and faculty. For example, research databases must be available to cover marketing reports and data, domestic and foreign competitors and customer companies of all sizes, industry analysis, and business ratios. According to the UNCG Business Librarian, Steve Cramer, the UNCG Libraries provide 19 databases relevant to entrepreneurship, of which 11 he deems absolutely vital. The total annual subscription cost to UNCG for those 19 databases is approximately \$245,000. The library also needs to provide access to domestic and international entrepreneurship journals. Examples of the international journals include the *International Journal of Family Business*, *Journal of Family Business Strategy*, the *International Journal of*

Entrepreneurship and Innovation Management, and the *Strategic Entrepreneurship Journal*, *Journal of Technology Transfer*, *Journal of Business Venturing*, and *Entrepreneurship Theory & Practice*, among others. (The UNCG Libraries subscribe to 27 journals and magazines that have “entrepreneur” or “entrepreneurship” in their titles, among over 2,000 business-related academic journals, trade magazines, and general business magazines available to UNCG students and faculty.) Beyond databases and journals, the library needs to have an outgoing, experienced entrepreneurship/business librarian to provide research instruction and consultations, and to advocate for library resources on behalf of the faculty and students. That librarian should also develop an Entrepreneurship Resource Guide that includes all resources in the library related to Entrepreneurship.

3. Cross-Disciplinary Courses as a Catalyst

The launch of the Entrepreneurship Cross-Disciplinary Program (ECDP) office and the North Carolina Entrepreneurship Center (NCEC) coincided with the availability of the new academic programs. The NCEC acts as an information portal to take the expertise within the university to the business community while the ECDP serves as a catalyst for cross-disciplinary exchange of knowledge within the university. I developed the vision and mission of each to make the purpose and boundaries of each clear. First and foremost, both the ECDP and the NCEC must support the vision and mission of the university. The North Carolina Entrepreneurship Center’s external mission supports a key element of UNCG’s mission in the 2009-2014 Plan: to be “A source of innovation and leadership meeting social, economic, and environmental challenges in the Piedmont Triad, North Carolina, and beyond” (<http://ncec.uncg.edu>). The Entrepreneurship Cross-Disciplinary Program (<http://entrepreneurship.uncg.edu>) (internal) is a university-wide, cross-disciplinary center focusing on engagement of students, faculty and staff with for-profit and not-for-profit organizations and entrepreneurs while working with the North Carolina Entrepreneurship Center (external) to advance the economic development of the region and to prepare individuals for meaningful lives in the Triad, North Carolina, and beyond.

Second, both the Entrepreneurship Cross-Disciplinary Program and the North Carolina Entrepreneurship Center must be built on a strong foundation before it is launched. The University of North Carolina at Greensboro made significant strides for two years prior to both the program office and the center being launched in raising awareness of entrepreneurship across campus and supporting the development of cross-disciplinary courses in entrepreneurship through its Building Entrepreneurial Learning for Life (BELL) initiatives. Sharing entrepreneurship across campus and with the community was viewed as further increasing the knowledge base in specific areas of interest and promotes the development of an “entrepreneurial mindset” but most importantly, an entrepreneurial skillset. The Entrepreneurship Program is built on this established internal, cross-disciplinary entrepreneurship foundation of 26 faculty, staff, and students as an advisory council that represents the eight profiles in our program: Creative Industries, Education Entrepreneurship, Family Business, Franchising, Healthcare Entrepreneurship, International Entrepreneurship, Science, Technology and Innovation Entrepreneurship, and Social Entrepreneurship. We form partnerships with the external community and do projects for these businesses in classes. The Center collaborates with other universities and economic development entities across the state to enhance existing business competitiveness and to create new sustainable globally competitive businesses. A Center and Program bring all

these efforts together, internally and externally, and takes them to the next level of achievement so there is a cohesive, strategic direction to our overall entrepreneurship initiatives.

Next Steps: Facilitating the Public/Private Dialogue

The example of The University of North Carolina at Greensboro illustrates the first steps in fostering the entrepreneurial skillset throughout the university. It is a model that can be replicated and adjusted for the country, customs, culture, and university specializations. Outcomes include creating generations of doctors, scientists, and engineers that possess an “entrepreneurial mindset” that not only understand their discipline specialization, but how to apply it through entrepreneurship to innovation. Additionally, it leads to producing administrators, faculty, staff, and students throughout the university with an “entrepreneurial mindset” that leads to reducing barriers to communication between academia and industry. Phan and Siegel (2006) point out that to make this happen, the university must have a technology transfer strategy that emphasizes entrepreneurship with technology transfer and addresses deficiencies in technology transfer offices as well as throughout campus in entrepreneurship training and commensurate reward systems. A recent study by Tello, Latham, and Kijewski (2011) support the arguments made by Siegel et al. (2007, 2003) and Friedman and Silberman (2003) that as the gatekeepers of university technology transfer, the technology transfer officers experience plays a major part in moving the university forward in this area. Their lack of training and experience in entrepreneurship can be a major hindrance. Wright et al. (2010) site the lack of connection between business schools and the technology transfer offices, as well as the other stakeholders in university entrepreneurship-faculty in science departments and university administration. The authors recommend internal university processes to improve this situation. For example, forming an internal board similar to the North Carolina Entrepreneurship Center University Advisory Board would be one solution.

Conclusions

While much work remains in the area of university entrepreneurship, a summary of 173 studies in this area concluded that multidisciplinary areas of study capture the core of the issues of progress around university entrepreneurship (Rothaermel, Agung, & Jiang 2007). Cross-disciplinary entrepreneurship education must occur throughout the university community, including faculty, staff, students, and administration (Welsh 2014). It has to be embraced seriously by being tied to permanent reward structures. Only then can internal processes are put into place that will propel university entrepreneurship be effective. An understanding of the steps involved in making university entrepreneurship among the stakeholders successful, a long-term strategic plan, and an “entrepreneurial mindset” and more importantly, and entrepreneurial skillset must permeate the campus community that goes beyond surface talk or the latest fad by the last administrator. It involves a total excitement throughout the educational system that understands the connections between innovation, commercialization and entrepreneurship and the crucial role that various stakeholders must be willing to play for successful implementation and effectiveness. Policies and procedures that reflect the critical role of entrepreneurship must be held up visibly throughout the internal and external community and be implemented through a long-term plan of action. Only then will internal as well as critical stakeholders take university entrepreneurship seriously.

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