

Work in Progress - Globalization and Business Innovation: How do we Best Prepare Millennial-Generation Engineering Students for Complex Challenges?

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Abstract - In response to recommendations provided by the Danish government, in order to meet the challenges we are facing in our globalized world, we have recently redesigned one of our courses in the Global Business Engineering program. We are striving to make innovation as a topic even more relevant by studying how companies can innovate that are above and beyond traditional product development. This broader scope, business innovation, includes investigating sources and drivers of innovation, incorporating design thinking, and embracing customer centricity as a mindset. In short it is about looking for the best combination of technical know-how and market expertise in a competitive, cross-cultural, environment.

Index Terms – Business innovation, creative processes, marketing across cultures, millennial generation.

GLOBALIZATION ON THE AGENDA

Recent research shows that our students, the millennial generation (those born between 1980 and 2000) are much different than Generation X. Their distinctive work ethic is characterized by being achievement-oriented, open-minded and collaborative while they have always been told they are and sought after and indispensable. In April 2006, The Globalization Council published a comprehensive report outlining key initiatives to address a desire for Denmark to be an innovative society [1]. The strategy is expressed in 350 specific key initiatives including education, cross-cultural insights and understanding, and new knowledge about more systematic incorporation of customers' innovation needs.

After the Internet afforded a great deal of the world's population connectivity and access, the notion of globalization became more prevalent than internationalization. Similarly, innovation emerged and is perhaps even more ubiquitous than the "quality" conversations. Although not a new topic, innovation has, without a doubt, proven to be one of the most important business topics in management, marketing, and new product development. Innovation provides a white space for opportunities in product and service differentiation, but are

we teaching engineering students to think about the needs and wants of society rather than continuing to emphasize a product focus?

BUSINESS CONCEPT INNOVATION

"Business Concept Innovation" is the title, or theme, of the fourth-year (eighth-semester), compulsory course, comprised of three sub-courses, which we have recently redesigned as part of the Global Business Engineering program [2]. Our point of departure is that innovation is systemic and about new value, not new things [3]. Our class size is typically 25-30 students and the youngest students are usually 22 years old. They have diverse ethnic backgrounds, whether or not they were born in Denmark. At this point in their education, which is their final semester before embarking on their bachelor projects, they are highly motivated and have built quite a solid foundation in several subjects. While they may be eager to learn, we have to be astutely sensitive to understanding millennials [4] as their expectations can be very different from ours, their baby-boomer professors. We cannot just present them with traditional logic in traditional teaching forms and expect them to be engaged. We must assure that the subject matter is interesting and relevant, and we also focus on associative aspects.

COURSE CONTENT

Business Concept Innovation is made up of several components including three separate courses, eight external business leaders, and a team project that is carried out in collaboration with a company. The three courses that comprise Business Concept Innovation are:

- Cross-cultural management and marketing
- Organizational learning and technology management
- Marketing and business innovation

A brief description of each course follows.

- In cross-cultural management and marketing, the students study several definitions and approaches to

culture. Core concepts include identity, country of origin and image effects, time and space dimensions, inter-cultural communication and negotiation theory. Relevant scholars include Usunier, Hofstede, Trompenaars and Triandis.

- Organizational learning and technology management examines several scholars' approaches to developing innovative working environments. These authors include Nonaka, Argyris, Kolb, Senge, Goldratt, Hamel, Barton, Schumpeter, and Christensen. Students learn about how organizations systematically manage their technologies and how companies build teams in connection with product development. They also study innovation as a discipline including types of innovation (incremental, semi-radical, radical) [5] and LEAN and Six Sigma concepts.
- Marketing and business innovation analyzes the opportunities and threats, or challenges that globalization presents. Globalization can be analyzed from many perspectives including cultural, financial, managerial and social. We take a business development approach to innovation including outsourcing and offshoring, learning from markets and customers, co-creation, open innovation and creativity. Pertinent scholars include Chesborough, Tidd & Bessant, Doz, Davila, Epstein & Shelton, von Hippel, Sawhney, Wolcott & Arroniz, Prahalad & Ramaswamy, and Csikszentmihalyi.

The aforementioned component of eight external business leaders is not just a seminar series of corporate presentations. We invite a new leader each week to work with the students for four hours, divided into two sessions over two days, with the class. In addition to presenting themselves, their companies and industries, they also give the students an assignment. The assignments are not fictitious cases but real problems and challenges the leaders are facing in their work. Each student team, made up of four to six students, presents their solution(s) the following day. Each team has the same assignment so many perspectives emerge and there is a healthy atmosphere of competition. Fortunately the quality of the responses is usually high, so most of the speakers are more than willing to return the following semester. The final component, the team project, is entitled "Innovation Technology Management". Each team finds a company to work with and a problem to solve. Generally speaking, students choose a company based on their internship contacts. The actual project is a 30-minute oral presentation. The guiding requirement is that each team has to incorporate a change model consisting of three parts: business aspects, organizational aspects and a technology component [6]. This model illustrates a systemic view of a company and is closely related to change management. It is important to note that the class meets for the three courses during the first nine weeks of the semester. The remaining five weeks are dedicated to full-time project work. We do

not meet as a class but the faculty members are available for consultation.

FUTURE PERSPECTIVES

While we feel that we have addressed several important innovation facets; innovation management, business development, cross-cultural and global challenges, there are many other potentially relevant fields we have yet to include.

- Entrepreneurship generally appeals to the millennial generation and their distinctive work ethic [6]. Working with theory and cases in entrepreneurship would also satisfy the Danish government's call for key initiatives [1].
- A leadership component. This could include human resource discourse on attracting and keeping the best talent. Additionally there has emerged a new focus on diversity [6] rather than a birds-of-a-feather mindset.
- There is a large body of research surrounding leveraging the power of communities and we have only just scratched the surface of that potential.

All in all we strive to make the course challenging, relevant and fun. Ideally we want to teach our students to apply their collective knowledge with vision in order to improve quality of life and sustain our planet.

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