

## GLOBAL DEFINITION OF THE TERM INNOVATION: THE SOCIAL FACTORS INFLUENCING INDIVIDUAL UNDERSTANDING

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### **Abstract:**

The term innovation is quickly entering the lexicon of the global business community. It has infiltrated every facet of strategic discussions within organizations. Yet prior research shows that how an individual perceives the definition of the term “innovation” may be greatly influenced by their individual education as well as culture. A previous study conducted in the western half of the United States state of Pennsylvania produced evidence to suggest that engineering students, business school students, and vocational machining school students maintained differing frames for defining the term innovation based upon their previous background and career education. The purpose of this study is to further the previous research and assess the impact of national identity on the concept of innovation. Through comparative analysis of university students in the United States and Poland, the differences and similarities in the understanding of the term innovation will be explored.

*Keywords: innovation, innovation education, innovation dissemination, information innovation, vocational education*

## 1. INTRODUCTION

With attention on the global financial crisis in 2008, there has been significant research and discussion on economic growth and stability as well as the role of technology and innovation. Since the 2008 United States Presidential Election of Barak Obama, the term “innovation” has become a popularized and used without strict convention of meaning in the United States. Over the course of his administration, President Obama focused US resources to foster and develop innovation. Those involved in the industry of manufacturing, whether in the US or elsewhere, are routinely told that in order for a company to survive in a global market it must foster innovation. Given the 21<sup>st</sup> century Internet-based globalized market, and the explosion of global companies maintaining a presence in multiple countries throughout the world, the question becomes “What does innovation mean?”

A previous study demonstrated that even within one country, such as the United States, individuals can generate multiple notions of the term “innovation”. A study of US graduate business students, graduate engineering students, and vocational machining students produced the following results:

- 14 of the 21 participants defined innovation in terms of improvements or changes to tangible objects or processes (this was evenly spread among the disciplines)
- 7 of 21 made mention of improvements to ideas in their definition of innovation
- 4 of the 6 graduate business school participants defined innovation in business terms, using words such as market, commercialization, and value

While the limited population of this study did not allow for generalizable conclusions, it did present some interesting notions for further study. For instance, the idea that the field of study of each of the participants influenced their understanding of the term “innovation” warrants further understanding. Furthermore, all of the participants were born and lived in the same geographical region in the United States. Is it possible that this influenced their understanding of “innovation”?

As previously stated, the term “innovation” is considered critical for industries such as manufacturing. How the term is understood by individuals and how it is disseminated becomes critical for companies to create and foster innovation in the work place. Indeed, creating an understanding of what “innovation” means is critical to successfully disseminating it within an environment.

While the exact definition of “information systems” is a source of debate, most definitions focus on the relationship between people, processes and technologies that assist people in making decisions. Clearly creating innovation in an organization of any kind involves both people and processes. Finding ways to use technology to foster this interaction relies on first understanding the interaction.

This study built on the previous work by examining the role of culture in an individual’s understanding of the term innovation. It examined the possible influences of national culture by comparing the results of United States undergraduate students and Polish undergraduate students in multiple majors. By looking at undergraduate students it hoped to ascertain what role education plays in developing the notion of “innovation.” By focusing on students in different countries it examines the role of national culture in this development.

This study looked to address the following research questions:

- How is the idea of innovation disseminated?
- What information systems are used to collect and share the innovation process?
- How do cultural differences impact an individual’s definition and understanding of the term innovation?

## 2. LITERATURE REVIEW

In 2009, the Obama Administration issued an initiative to generate and sustain innovation in the United States economy (National Economic Council, 2009). In addition to proposing key elements for the industrial sector, the strategy highlighted support for initiatives at the kindergarten through 12th grade level as well as colleges and universities. Also critical was the formation of the National Advisory Council on Innovation and Entrepreneurship (United States Department of Commerce [USDC], 2013). This council, comprised of “some of America’s leading entrepreneurs, investors and university leaders” (USDC, 2013, p. 4), provides the US president with “ideas and feedback on policies that nurture innovation and entrepreneurship” (USDC, 2013, p. 4).

Following the 2009 US Executive Branch initiative, the US Department of Commerce released a 2013 report entitled “The Innovative and Entrepreneurial University: Higher Education, Innovation & Entrepreneurship in Focus” (further discussed in chapter 2 of this document), featuring the department’s study of innovation and the related entrepreneurship education in US institutions of higher education (USDC, 2013). In brief, the report represents the culmination of a study conducted by the Department of Commerce’s Office of Innovation and Entrepreneurship from 2011 through 2013.

The study focused on information gathered from leaders at over 130 United States colleges and universities. This educational assembly represented institutions that signed a letter submitted to the United States Secretary of Commerce in 2011 (USDC, 2013) by the National Advisory Council on Innovation and Entrepreneurship (NACIE) (USDC, 2013) in conjunction with representatives from the Association of American Universities, a group comprised of research universities in the United States (Association of American Universities, About the AAU (2016). Retrieved from <http://www.aau.edu/>). The letter served as a commitment to the teaching of innovation and entrepreneurship at these institutions (<http://www.innovationamerica.us>, 2016). According to the USDC report, “the universities affiliated with the letter are each addressing innovation and entrepreneurship in diverse ways relevant to their research budgets and programs, student population, geography, history and culture” (United States Department of Commerce [USDC], 2013, p. 9).

## 3. RESEARCH DESIGN

This study used a survey tool consisting of 11 questions in total. Questions 1-7 focused on participants’ demographic information. Collection of this data was considered critical to understanding the impact of culture (regional, national, and educational) on the development of each participant’s understanding of innovation. Questions 8-10 gave each participant the opportunity to define the terms “innovation” and “innovation education” as well as to describe their experiences with innovation during their tenure as a university student. Question 11 provided the participants with the opportunity to share any additional information they felt would be relevant to the study.

The study focused on undergraduate university students in the northeastern United States and in Poland. As stated in the literature review, innovation is a topic of much interest in US universities as of 2017. Poland was chosen for study given its rise in economic standing in the EU and the call from the World Bank to explore more innovation opportunities to keep the Polish economy growing. According to World Bank Regional Director for the EU, Arup Banerji, “If Poland wants to continue its ascent and meet the rising expectations of citizens, it needs to build on its reform successes -- such as prudent fiscal policy -- but also initiate new reforms around innovation and progressive labor market regulations and institutions.”

The survey was administered live in classes in an open question format. The researchers felt this was necessary to capture each participant’s individual understanding of the terms “innovation” and “innovation education” with as little bias as possible. Survey results were collected and compiled for analysis.

#### 4. RESULTS AND DISCUSSION

Tables 1 and 2 demonstrate that the ratio of male students to female students in both countries, while not identical, is close enough to provide any indications of diversity of definitions of “innovation” and “innovation education” between the genders. It is interesting to note the slight difference in age between the two countries with students in the US being slightly younger than their Polish counterparts. Beyond this the diversity of major concentrations of study between the United States students, versus the business focus of the Polish majors offers an opportunity to explore different patterns in the participants answers.

After compiling the data using Microsoft Excel, the researchers searched for patterns in the answers. When asked to define the terms “innovation” and “innovation education” a number of interesting patterns presented themselves. In some instances students from one nation used terminology in greater extent than their counterparts, in other instances there was an overlap of terminology, both scenarios are presented in tables below, followed by discussion.

As presented in table 3, participants from both countries (31% of Polish participants and 43% of US participants) used the word “new” as part of a definition of “innovation”). Additionally, 28% of Polish participants and 13% of US participants used some variation of the word “improve” as part of their definitions. Of equal interest is the use of the term “technology” by 10% or more of both participant groups when asked to define “innovation”.

Students from the US were more likely to use terms such as “idea”, as in a “new idea” or the word “create” as part of their definitions. In contrast Polish students used a variety of terms to express these notions. Terminology was equal between genders when put in the context of percentages of each gender participants, thus gender was not a factor in answers given in this study. Interestingly participants from both counties used the word “product” as a part of their definition as well.

In neither case did age or major concentration of study appear to be a factor in terminology chosen by the participants. In the case of students in the United States, all were required to take a core set of classes from different disciplines at the university. Whether this accounts for the students using similar terminology is unknown at this time.

When asked to define the term “innovation education” the consensus answer from participants from both countries was that it involved tools and techniques used in teaching, as opposed to actually attempting to teach innovation itself. Innovation education was implicitly interpreted as innovation for education—particularly the delivery of education.

**Table 1: United States Participant Demographics**

<b>United States Students</b>			
<b>Total</b>	<b>Age Range</b>	<b>Major</b>	<b>Degree</b>
65 Students Total: 27 Female 38 Male	Age 18 – 29 Age 18/19: 55 Total 23 Female 32 Male >19: 10 Total 4 Female 4 Male	Accounting 3 Female Actuarial Science 1 Female Biology 3 Female Biomedical Engineering 1 Female 1 Male Bus. Management 3 Female 2 Male Communication 1 Female Criminal Justice 1 Male Cyber Forensics 1 Male Environmental Science 2 Female 1 Male Finance 2 Female 6 Male Graphic Arts 1 Male Hospitality 2 Female 1 Male Industrial engineering 1 Male Marketing 3 Male Mechanical Engineering 3 Male Psychology 4 Female 2 Male Software Engineering 1 Male Sports Management 2 Female 3 Male Undecided 4 Female 3 Male	Bachelor's Degree 64 Total 27 Female 37 Male  Master's Degree 1 Male

**Table 2: Polish Participant Demographics**

<b>Polish Students</b>			
<b>Total</b>	<b>Age Range</b>	<b>Major</b>	<b>Degree</b>
100 Students Total: 57 Female 43 Male	Age 18 – 29 Age 18/19: 2 Total 2 Male >19: 98 Total 57 Female 41 Male	Finance 8 Female 4 Male Logistics 27 Female 36 Male Management 22 Female 3 Male	Bachelor's Degree 90 Total 49 Female 41 Male  Master's Degree 8 Female 2 Male

**Table 3: Terms used to define "Innovation"**

<b>Term</b>	<b>Polish Students</b>	<b>US Students</b>
"New"	31 (31%)	28 (43%)
Idea	7 (7%)	13 (20%)
improv(e, ing)	28 (28%)	8 (12%)
create	0 (0%)	8 (12%)
Product	12 (12%)	4 (6%)
Technology	11 (11%)	9 (14%)

<b>Term</b>	<b>Polish Students</b>	<b>US Students</b>
Method	53 (53%)	0 (0%)
Process	1 (1%)	7 (11%)

It is striking that 53% of Polish participants used the term “method” as part of their definition of “innovation education” while approximately 11% of US participants used the term “process”. Whether this is an instance of synonyms or involves a differing understanding of the terms between the cultures is unknown at this time.

When asked how innovation is being taught at their respective institutions, the results from both participant bodies became more intriguing.

In both groups (table 4), roughly 30% of the participants stated that the classroom (using terms “lecture” and “class”) is how innovation is taught at their institution. 9% of Polish students also cited conferences as way in which innovation is taught, while 13% of US students stated that technology is used to teach innovation. Roughly 10% of the US students also used the American expression “thinking outside the box” as a phrase to describe how their instructors teach them innovation.

**Table 4:** How is "innovation" taught?

<b>Term</b>	<b>Polish Students</b>	<b>US Students</b>
lecture	30 (30%)	0 (0%)
conference	9 (9%)	0 (0%)
Internet	5 (5%)	0 (0%)
class	0 (0%)	16 (24%)
technology	0 (0%)	8 (12%)
"do not learn"	12 (12%)	0 (0%)
"think outside box"	0 (0%)	7 (11%)
[not sure]	0 (0%)	7 (11%)

What is perhaps more significant is the number of participants from both countries that stated either "innovation" is not taught at their school or they are not sure that it is taught. Over 10% of participants from both groups expressed this notion.

Finally, when asked "What taught as "innovation"?" 90% of participants from both countries did not know what answer to provide. Most left the question blank. Roughly 10% actually stated that they did not know, others cited "new technology". While it is possible that the problem lies in the way the question is phrased (cited above in its direct form) it is also possible that the participants understood the question and simply did not know how to answer it.

## 5. CONCLUSIONS

Based upon US government policies and comments from both President Obama and President Trump, innovation and the stimulation of innovation are considered critical to economic success. This is also true in Poland as cited in the World Bank report. While this study is not a comprehensive investigation of the dissemination of innovation through universities it offers a "snapshot" of the current how innovation is understood by students.

1. Participants from both groups show a tendency to identify innovation with technology.
2. Also a tendency to equate the word "new" with innovation
3. Polish students lean towards "method" while US students use "process"
4. Both groups used term "idea", these were undergraduate students, this word was not used by graduate students in earlier study
5. Both use the term "product" leaning towards tangible goods
6. Clearly students believe innovation is being taught, even if they are not familiar with the term "innovation education"
7. When asked how it is taught, they are less certain
8. When asked what is taught as innovation, most appear to not be able to cite examples
9. Gender does not appear to play a role in the culture of innovation
10. National identity appears to play a role in how innovation is addressed. Polish students are encouraged to attend conferences and events while US students are encouraged to engage technology
11. One caveat to this; US students cite the American phrase "Think outside the box" (first used by Disney Corporation although not sure) as a way in which instructors convey "innovation". Is there a Polish equivalent to this American lexicon?
12. Concentration of course of study may be a factor in understanding and awareness of innovation and should be included in future research.

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