Suggested citation:
Lane, P.M. (2016). Creating the environment for innovation and entrepreneurship. In: M. Kosała, M. Urbaniec & A. Żur (Eds.), *Entrepreneurship: Antecedents and Effects* ("Przedsiębiorczość Międzynarodowa", vol. 2, no. 2). Kraków: Cracow University of Economics, pp. 53-66.

Creating the environment for innovation and entrepreneurship

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Abstract:

Innovation generation and diffusion have been widely acknowledged as hinging upon the complex set of institutional, social and psychological processes. The objective of the paper is to examine the need and possibilities of creating the environment for innovation and entrepreneurship in the university setting. In particular, this paper focuses on interrelationships and roles of specific groups of university members: the administration, faculty and students. The study is exploratory in character, based on observations and literature review. It starts with defining modern-day university as home of innovation emphasizing the need for interdisciplinary and interinstitutional approaches. The paper discusses the need of faculty to learn to reach across the institution and beyond to work with others, working across silos of academia and meeting with others from very different disciplines. Second it examines ways the university administration support can encourage innovation among its faculty, staff and students. Third, it draws on existing research to identify key dimensions of change. The study proposes pathways that may activate the mechanisms of climate and infrastructure for innovation. The proposed dimensions and analyzed areas of change can potentially form the foundations of a framework for universities seeking to diagnose their existing condition and use such findings to enhance the generation and diffusion of innovation. The university quest to break down the barriers and reach across the disciplines to generate innovation takes commitment which needs to be coupled with administrative change such as the reward structures lined up with the vision and changes regarding the teaching and learning practices as well as the physical environment for the classes, the class rooms and meeting spaces of students and faculty.

Keywords: innovation, environment for innovation; interdisciplinary; culture of innovation; tools of innovation
JEL codes: M14, I25, O21, O31, O35

1. INTRODUCTION

While innovation can happen accidentally anywhere one or more minds are together, if a university considers it to be part of its vision and mission it has to plan to encourage its growth. The University needs to create the atmosphere that will help with the growth of innovative and entrepreneurial thinking. The University must consider different types of leadership in innovative thinking, including the

current focus on the design thinking. This paper examines creating the environment for innovation and entrepreneurship in the university setting. It draws on experience of two very different academic environments: US and Latin American Universities. In the US are 50 of the top 100 most innovative universities and in Latin America there are none (Thieveaud, 2015).

The paper is exploratory in character and formulates important questions. It explores the potential of business or engineering schools as the right place to create the innovation environment through engaging interdisciplinary, and interinstitutional logic. The paper analyzes the problem of supporting teams functioning across departments, campuses and colleges and mentoring them with faculty from different areas. The paper also discusses student engagement: how early in the process should students be encouraged to participate? Is it better to start with first year students or seniors?

The first section of this paper addresses the location of the home of innovation in the university including the need for some schools that are single themed to work with other universities. Second it examines ways the university administration support can encourage innovation among its faculty, staff and students. In order for succeeding generations of students to learn the innovative process, the current generations of faculty must also learn the process. Third, the paper discusses the need of faculty to learn to reach across the institution and beyond to work with others, working across silos of academia and meeting with others from very different disciplines. This is necessary as hearing the different perspective opens one mind to new ideas, which is the first step in innovation. Fourth, the paper identifies the necessary environmental support for innovation; offering support for the culture of innovation on the campuses of the university. The conclusions suggest that instead of letting innovation happen apparently randomly, Universities can work hard to get them into a coherent stream of cross sectional cross institutional activities based on exchange and cooperation to encourage, facilitate, foster and thrive on innovation.

2. HOME OF INNOVATION: THE NEED FOR INTERDISCIPLINARY APPROACH

One can label any department or institute with the word innovation, but unless it is actually providing a nurturing environment for people across the disciplines it is probably not achieving its goal. Business and Engineering may not be the right or only place for innovation in the university. Traditionally universities have tried to work with business schools and engineering schools or colleges. Theoretically the engineers know how to build the idea and the business people from marketing and entrepreneurship should know what is needed. New Product texts often relate the two areas slowly adding on other business areas like Finance for cost of capital, Accounting for product cost, and operations for how to manufacture or put into process the new item. It is one thing to go to the store and pick an item that exist and suggest that your organization should have one as well. It is another to try and come up with a new solution to problems that face people in our world, country or

region. Problems can be well defined such as, how do you make it easier to have a really good cup of coffee in the morning, or how do you feed 9 billion people? Therefore Universities need at least two key elements to generate innovation. First universities must encourage teams that reach out across the institution to include different disciplines in the most vibrant and creative ways. Second extensive research must be done into defining the gap or the need to be resolved. This requires.

Since ancient times universities have separated faculty into different disciplines forming silos. These disciplines have often ended up in their own building such as the medical building, or they are grouped with similar disciplines such as the sciences building, containing biomedical science, chemistry, physics and more. In the Unites States as campuses were built the style of separation became more and more popular as donors were sought to fund the Anthropology building, the Communications building, or the Theater building. The practice of sprawling campuses with separate buildings for different disciplines led to much deeper scholarship in each discipline. When you spend all day with people in the same department you are not likely to easily pick up ideas from someone across the campus.

As disciplines get department heads and deans with their own reward structures they become more and more insulated from other departments and interdisciplinary thinking. Add to this separate accrediting agencies for business, engineering, and other disciplines and universities lose the important cross disciplinary, or anti disciplinary thinking that is needed to encourage creative innovative thinking. In Innovative *Pathways for University Entrepreneurship in the 21st Century*, it is pointed out that for entrepreneurship and innovation the working across the disciplines, especially across the silos is very threatening to administrators (Hoskinsons & Kuratko, 2014). University wide programs are silo busters and the question is the administration as ready as is the faculty to advance change? From a corporate perspective, Smith (2012) says that silo cause problems in three major areas, the priorities are not aligned, silos bloc information flows, and there is often a lack of coordinated decision making.

Many of the problems that the world faces today needs to be looked at across the disciplines. There are some large problems which have been labeled in the past wicked problems (Rittel & Melvin, 1973). Such a problem is that of feeding the world. This is a problem that requires multidisciplinary approaches: the demographers to show the rate of urbanization, the agronomist to show the amount of arable land, the ecologist to inform on the degrading ecosystems, big data experts to look at problems in new ways, the biologist, chemist and many more to help with solutions, as it is not only what is grown, but how much is lost in the ground, in handling, transport and storage. Add to this smart phones in the hands of farmers, apps, and the world of technology and problems can be more manageable working across disciplines (Carlson, 2015). Listed below is a long but not inclusive list of disciplines that would work well as part of an interdisciplinary innovation or entrepreneurship cohort:

i. Anthropology
ii. Art
iii. Biomedical Sciences
iv. Chemistry
v. Communications
vi. Computer science
vii. Cultural studies
viii. Dance
ix. Design
x. Education
xi. Environmental Sciences
xii. Ethnography
xiii. Geography
xiv. Graphics
xv. History
xvi. Kinesiology
xvii. Library Science
xviii. Languages
xix. Mathematics
xx. Medicine
xxi. Nursing
xxii. Occupational Therapy
xxiii. Physical Therapy
xxiv. Physics
xxv. Psychology
xxvi. Recreational Therapy
xxvii. Research or Investigation
xxviii. Sociology
xxix. Social Work
xxx. Special Education

Defining the gap, the problem, the opportunity that might be focused on is a very important issue for any innovative process. Universities have research institutes and faculty performing research all capable of helping to define the gap or the need. The problem definition or theme is a key to starting the innovation process. There is an art deciding on the opportunity of focus. If you think you can end poverty in the world you have no definition or focus. The United Nations in their millennial goals provided some distinct gaps to work on which led to much creative work on the problem of poverty (United Nations, 2015).

Design thinking can be a starting point in identifying and framing the problem. In Design thinking this is done with Empathy; trying to understand the experience of the segment of the population you are trying to serve. What is the problem? How many people experience this problem in the community, the regions, or the world? What are the people like who experience this problem? What do they feel when they experience the problem? Is this a problem that you see as a problem because of your culture? Maybe it is not perceived by the people you are observing. This is where those who are good at investigation and research can help. The challenge of the university is to be sure that these kinds of people are a part of innovation teams.

At the CIIC in New Zeeland in 2015: There is no simple fix to the education system. The problems in the education systems of many countries are symptoms of a bigger cultural dysfunction. Acquiring knowledge must not be confused with memorizing information and acquiring beliefs. The goal of teaching must change from transmitting factual information to the cultivation of thinking tools. Knowing how to ask useful questions and knowing how to reason and use the scientific method is much more important than memorizing answers (CIIC, 2015).

Radjou *et al.* (2010) discuss the idea of, "reframers", those who reframe a problem from a different perspective. Examples include, Indra Nooyi reframing Pepsi has a provider of health solutions, Jeffrey Immelt's reframing GE Medical to focus on more for more people for less environment and economic cost and Ratan Tatta reframing the up and coming from low earners to high yearners. Universities

can encourage these alternative ways of reframing problems. One clear method to at least increase the perspective is to include more disciplines in the mix as people than will address questions from different perspectives.

3. ENCOURAGING AND SUPPORTING INNOVATION ACROSS THE DISCIPLINES AND INSTITUTIONS

There is a number of factors which can contribute to faculty exchanging ideas and working together across disciplines. Mentong is one way to encourage the development of interdisciplinary work and potentially innovation. Most mentoring is done within colleges, and departments. In the case of Innovation, within the university reaching out across departments for those who think differently, possibly the reframers who can mentor others to think about problems in new ways holds great potential. If we take a look at a problem like the above mentioned feeding the 9 billion people in 2050 you can begin to think about how this interdisciplinary approach might help all the faculty involved to advance.

In order to expect outcomes, the right actions need to be rewarded. A reward structure for any of the interdisciplinary innovative activities sends a clear message. In most schools the rewards are passed out through the provost to the Deans and to the departments on some kind of rational system, (research, teaching, service), that supports the work of the departments and the schools or colleges and thus the university. This encourages the fiefdom, the territoriality or what is called in the United States the silo approach. Universities that really want to encourage looking at the world in new ways across the disciplines. Several options appear here: direct compensation as in traditional pay boost, some kind of indirect compensation such as the opportunity to participate in retreats that are workshops on innovation, or innovation in practice; and finally the opportunity to participate in some kind of innovative challenges. An example, might be ten faculty each given a portion of the cost of a travel some place in the world. As a team they must select where they are going, how much each of them will need to pay, what larger problem they hope to work on, and finally what will each discipline organize something in the country of focus relevant to the problem? This is just an idea of how this might work.

Reaching across institutions for interdisciplinary teams is another important concept. A typical early level example was a university that had a business school but did not have an engineering school would seek out an engineering college or university as a partner. This raises all sorts of challenges but also a vast array of opportunities.

If the goal is to create an environment where innovation can flourish than having faculty and students from different backgrounds can truly enrich the process and the potential for making the product real. Business students, and many others today can develop an idea. In order to take that idea to reality they need engineers, designers, and people from many of the careers mentioned above. University administrations need to be open to the idea of including other universities that have complimentary organizations, careers and students.

When the author was working in another country with a colleague and they had only a generalized regional university branch of one of the nation's main universities they reached out to find other universities to work with. The author's colleague scoured the regional city looking at public, private, church controlled, universities trying to find one that could contribute engineering and more to the mix. He was successful and most important the administrations on both sides were willing to let this odd relationship of a public regional campus, and the local campus of a private national competitor work together. It got things moving.

Today in a similar effort in the United States two universities four colleges and one giant of innovation in the corporate world are working together to try and understand how best to do these look at problems in new and different ways as they seek to make innovation happen amongst their students and faculties. Administrations need to dare to explore new areas, encourage faculty members to try relationships that might not have been considered before. Leaders need to look at their own campuses and the disciplines and majors taught but what else is available in their city and in their region. In this technical age it may be that through software platforms teams from very different approaches can work together possible even in different languages.

4. SYSTEMATIC SUPPORT FOR THE CULTURE OF INNOVATION

There are many ways in which a university can begin to support innovation and innovative thinking amongst students and faculty. Some are focused on providing opportunities for students and some are focused on providing opportunities for faculty members to grow and change. It is interesting how many universities tend to focus on throwing money at the idea by hiring new staff, creating new units and other big plans. In fact, a little creative support may generate some rapid interdisciplinary activity and idea development.

An easy start up solution is to make available to students and faculty all the things that are going on in the region that are related to developing innovative thinking. In the United States there are many. There are programs like Business Plan Competitions, Idea Pitches, the Rally, Start-Up Weekend, and the Hult Prize that are occurring all the time. In many states and countries there are competitions, government, educational, industry, or artistic events related to innovation that could be put on the calendar. People are often surprised at how much is going on in their area that they never looked at before they started to put together a calendar.

Encouraging students to participate in innovation related events is important. Students do not require much of an incentive to enter competitions if the university will help to pay their entrance fee. Just the awareness that they can go to an office and have the potential of support for an entrance fee will be motivating. Of course once they are enrolled in a competition students become competitive and want to generate the best ideas they can. They use whatever resources that they can tap into. Many of them will either seek out a mentor or mentors, or run around the university

getting people to help with each part of the project. This is in itself generates interest and more of an innovation culture.

The students with their smart phones are so much more empowered today. In only a matter of minutes after finding out they have support they have a team and are working on the problem. They can reach out to the community quickly but with the apps now available they can contact people all over the world and if they can get over the language barrier they can get them moving as well. It only takes a little support and a little interest to get students highly motivated.

There are many excellent conferences that can help people advance in their thinking about innovation. These exist in different disciplines (SEA, Self-Employment in the Arts, CEO, Collegiate Entrepreneurs Organization which is interdisciplinary, Start Up Weekend which is interdisciplinary, interinstitutional, and engages the community) and in the professional world. While the ones listed above tend to be US based there are many all around the world. Sustainability issues and the strength of technology have led to many interdisciplinary conferences and participating in them is a valuable source of inspiration, meeting new people and new ideas, for both faculty and students.

5. ROLE OF PEDAGOGY AND INFRASTRUCTURE IN ENCOURAGING APPLICATION

One can quickly make the argument that one should work with the most advanced students. They have the most discipline knowledge, the most experience, and the maturity to follow a process. However that might not work. The more advanced the students the more likely that they are well schooled in their disciplines. This is likely to impact their ability to be open to new ideas and to creativity. In contrast students who have little experience are much more open to ideas but may not have the technical skills. Some universities including the author's university have experimented with working on innovation with first year students. These students do not have defined approaches to problem solving that you might find in a specific discipline. They can focus on a general process of developing an idea without focusing on a discipline.

Faculty plays a central role in supporting innovation and encouraging new ideas generation. If a professor arrives at class with notes on the computer or in hand that they have been using for ten years it is doubtful that they are changing rapidly. Similarly if a professor is not willing to let the students challenge what they are saying the class is probably not encouraging innovative thinking. Academics need to give a lot of thought as to how you encourage innovation and entrepreneurial thinking. Sadly many of those teaching were taught under one of the great systems of memorization that existed in the 20th century. Even until the end of the twentieth century the focus had to be to learn, to know, and memorize, or work with the same things repetitively so that a student would know it for a life time.

In the 21st century all knowledge is easily accessible through a device we can carry on our person or in a hand bag. Ericcson estimates that 70% of the world's

population will be smart phone users in 2020 and this is a game changer (Ericsson Mobility Report, 2015). The world's knowledge is accessible by almost everyone from almost anywhere. So what does a university do with her students? The idea of the sage on a stage or the lecturer in front of the class room or auditorium may be outdated. The challenge may be to help students to learn how to use the technology they are holding to access good information, and then how to apply it in a meaningful way. The university that wants to encourage innovation and entrepreneurship will be prepared to change pedagogies rapidly. This shift requires adaptation of administrators, reward systems, evaluation systems, and all the players in and around a university space.

There is much that one can do to encourage creativity, encourage innovation and entrepreneurial thinking but it requires university administration to think beyond traditional facilities. Most classrooms are arranged in some kind theater fashion with everything focused forward and that is what students are used to. They walk in sit down face the professor listen to a lecture or a presentation and leave. Some university introduce rooms in which everything points to the center. There are three screens and three projectors and ample whiteboard space both fixed and movable. Students from their seats can control a screen as well as the professor. First the setup of the room discourages a front helping the professor to think in new ways. The students who suddenly are empowered as well begin to think differently. The room is amazingly flexible and in that way supports flexibility, creativity, and that helps with new thinking for entrepreneurship and innovation.

One has to wonder how many university administrators send their class room designers and furniture purchasing people out to see what is possible. In one of the university systems the author works with the faculty complained about their traditional armed chairs. However, when I suggested that maybe the buyer should join the group the faculty were surprised. How will the designers and buyers learn if they cannot see what is today and what may be coming tomorrow? Sadly it is often not the innovative professors, or the young that are asked to help with the design of new buildings. Instead the administration counts on the senior faculty and administrators they have known for a long time. So there are knew things but not the set up for whole new ways of thinking to create innovative learning communities.

The same problem exist with laboratories and workshops. How many laboratories or workshop are there in business colleges? Where is the space, and what needs to be in maker labs? Change is occurring rapidly and a few 3 D printers of different sizes are needed. Also needed are spaces to build with wood and material and to experiment. These are not present in most business colleges as they were built. Creativity flourishes when nurtured. What can the university do to create maker or creativity labs?

Along with labs advisors or people with know how are invaluable. How do you sew this? How to you make this out of wood? How do you create a 3D printed model with more strength? Having the technology is part of the issue and then having the people who can lead in its use, who can help students and faculty figure

things out in the labs and workshops is important. In the United States good examples of these laboratories and workshops can be found in design schools and colleges.

There are a lot of things that University Administration can look at in order to support either or both innovation and entrepreneurship. Starting from the top does the university vision include innovation and entrepreneurship? Are there reward structures in place for those who are doing these kinds of activities? Do faculty who participate in programs of this sort expanding their skills and learning, and abilities get university rewards? This is admittedly problematic as innovation and entrepreneurship do not fit neatly into classes, they do not fit neatly into service, and the same is true with research. The standard areas for evaluation. Do universities need a culture change to reward these activities? Does the university support administration with spaces for innovation activities? Getting a space where you can put keep ideas on the walls, where you can do pictorial histories of ethnographic studies, where you can maintain the results of brainstorming it is original format can be important. Are the spaces suitable for model building, maintenance as students and faculty explore ideas?

Faculty who have ideas are often not the right people to transfer them to the market place. Does the university have some kind of tech transfer program? This would help the pure scientist evaluate their ideas and decide which ones may belong in the market place of the country or the world. Often faculty research develops obscure parts of something greater and others need to help them see that their ideas are only parts of a whole. A technology transfer program could be an important part of a whole innovation and entrepreneurship push at a university. Faculty need to think differently if they are to learn with their students in the 21st century.

If the administration is committed to creating an environment for innovation and entrepreneurship it needs to offer a variety of programs to its students, but most importantly to its faculty. Technology is changing the ability to do things rapidly. Faculty need to rethink individual class meetings, whole classes, majors, or careers. How do you begin to create true interdisciplinary thinking and classes in a University? If you are working on entrepreneurship you have to recognize that it will draw from many disciplines and students will feel that classes are somewhat repetitive as they work on a market plan in marketing, a business plan in entrepreneurship, a strategic plan in management, a promotional plan in advertising or communications, a financial plan in finance. These challenges take time to work out and it requires novel approaches. The more support there is from administration the better.

Faculty programs can be offered in short programs as they are on some universities. Longer programs give faculty a chance to get away from their classes and to think on three important levels. First what is this thing that is innovation or entrepreneurship? By participating in a program they can increase their learning tremendously. Second what is the role of my discipline from Anthropology to Zoology in this kind of thinking? Lively moderated discussions can bring out the questions about how does this thinking work in biology to therapy. In the authors experience

faculty from across the disciplines are at first puzzled as to why the university administration included them in such a program. Third, how do you use this in a course in medicine or social work? Some who are engaged in innovation or entrepreneurship believe that everyone should see the way immediately.

Change is not easy as faculty members have spent years and years getting more and more specialized. The larger and older the university the harder it may be to change the culture. Kirpatrick (2014) points out that being big and venerable is not good for innovation in the corporate world. The same may be true for universities in many countries. Even the rubrics for submitting papers to academic conferences can be quite restrictive in terms of open thinking. This is what faculty do. A university administration that wants to change that to look at the future differently must be willing to spend time educating and helping its faculty.

6. DISCUSSION

There is not readily apparent literature on creating climates for innovation within the university environment. Issaksen and Akkermans (2011) provides a good literature review demonstrate the importance of leadership on the climate for innovation. Issaksen *et al.* (1999) through their work at the Creative Problem Solving Group, Inc., point to Creativity Research Unit technical reports on specific organizations. For example they used their Situation Outlook Questionnaire (see dimensions below), to investigate the innovation climate in a global health care company. They found differences in climate perception with differences in empowerment and in risk. They went on to make recommendations to industry. Are universities similar enough on a global basis to develop such a measure to help determine climate?

Table 1. Dimensions of fostering innovation at universities

Ekvall's 10 dimensions adapted from M1 Creativity	**Groupings** adapted from M1 Creativity	**As seen by author applied to Universities** adapted from the author's writings above
Challenge	Resources	Challenges of administrative fiefdoms.
Idea Time		Mentoring across the disciplines, Tools for innovation across the campuses, Design thinking.
Idea Support		Defining the Gap, Innovation Challenges, Support for out of discipline conferences and interdisciplinary attendance.
Trust and openness	Motivation	Working across institutions.
Playfulness and Humor		Leadership style.
Conflicts		Conflicts over resources, and territory?
Dynamism		Developing a calendar of events. Design Thinking? Applied teaching.
Risk Taking	Exploration	Experimenting with different levels of students. Support for competitions.
Debates		Is debate welcome?
About the Issues		
Freedom		Interdisciplinary

Source: own evaluation based on (Ekvall & Ryammar, 1999).

In most universities every college and institute has its own climate through observation, which does not support innovation goals.

Similarly from an Engineering perspective Panuwatwanich *et al.* (2008) emphasized the important role of leaders in creating a culture of support for innovation. Ekvall and Ryammar (1999) looking at a Swedish University found that the university climate and resources appeared to be the strongest influence on creativity. They identified 10 dimensions that affect creativity. These were organizational and not focused on educational institutions or more specifically universities (Table 1). Further they were focused on creativity and not on innovation. Table 1 was created using Ekvall's 10 dimensions as found in M1 creativity and then trying to place the issues advanced above in this paper (M1 Creativity, 2016). There seems to be merit in university administrations taking a look at the organizational creativity work as a basis for creating an environment more encouraging and supportive of innovation.

Looking in the opposite direction at industry, Day (2016) of Idea Scale advances ten qualities of great innovators:

1. Encourage Risk Taking. In the universities this author has known we do just the opposite with young faculty.
2. Teach others.
3. Start Somewhere. This is the concept of lean startups, but is not the traditional advice or academics. Failure is ok, but what about in academia?
4. Look for Patterns.
5. Stay Positive. This is not necessarily the strength of faculty at most major institutions who feel limited, or restrained, this is not to say there are not many positive faculty.
6. Incentivize Innovation. This is mentioned above. Universities are willing to pay for potentially profitable patents but how much are they willing to invest in innovation, and innovative thinking?
7. Team players. A great example of this is team teaching, which unfortunately is often considered expensive.
8. Connect. Creating and supporting collaboration where it appears. Some universities actually punish those who reach outside their disciplines to work with others, to experiment, to try new pedagogies.
9. Value Culture. Day says that "57% of CEO's believe the most important factor for successful innovation is the culture. How many Chancellors, Rectors, and Presidents see as their job to create an innovative culture?
10. Value Innovation.

Specifically looking at the Innovation Climate Educause Center for Applied Research found in 2004 that almost 2/3s of It departments had low or low average support for innovation (Katz et al., 2004). This gets more interesting when you look at their break out by type of institution where you see the highest support for innovation at BA granting institutions and it goes down steadily as you move up through Masters, Doctor Int. and Dr. Ext. Carnegie classes. While old, and limited, it does

give some measurement of support for the innovation climate. Once again you think where IT reports and as in the case of creativity you end up looking at the role of the top administration in creating the environment.

From the literature it is clear that there the question of climate for innovation has been more important to corporations and other organizations. In this time of great change is it time for university administrations to think about assessing climate and then with knowledge making purposeful changes in the direction favoring innovation.

7. CONCLUSIONS

Innovation and Entrepreneurship in a university requires change from top to bottom and in each individual. It may actually be very threatening to some. Many have worked long to become a professor and know how to give a lecture in one discipline, know how to perform research in one discipline, and know how to be a professional in one discipline. When university wants to change to be more innovative more entrepreneurial what does that mean to an individual faculty member?

The third decade of the 21st century will be a time of even faster change than the second decade. More people will have useful access to the internet through smarter and cheaper devices. Students who have been brought up on technology will want to learn differently. In the United States preparations are being made for generation Z and how will they learn in contrast to the Millennials. Universities may have to wrestle with the idea that the human brain will be used less to store information and more to connect and apply information in new ways to advance humanity.

Universities that want to lead their nations forward will need to transform themselves from repositories of knowledge to centers of application of knowledge for the betterment of the human community, for the betterment of their nation, for the betterment of communities. Pure research will continue to be needed in all kinds of areas, but the ability to help students to think through how to connect and apply information in new ways will become increasingly important in the very near future.

Further areas of possible investigation could be the following issues: (i) what is the perception of administrators regarding innovation at universities?; (ii) is there a difference in approach in the market driven countries versus countries driven by humanism?; (iii) could one of the tested organizational climates questionnaires be adapted to the universities to help administrators?

University administrations will need to craft a vision of what they hope their university can become and then work to transform their university in that direction. If the vision is to be innovative and entrepreneurial the administration needs to be prepared to help transform the faculty as only through that process can they begin to transform the thinking of their future generations of students. As pointed out in the paper, the administration has to take action and introduce changes for the creation of an environment that supports innovation and entrepreneurship.

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