
THE KNOWING-DOING-GAP AND THE ROLE OF THE ENTREPRENEURIAL UNIVERSITY IN THE DEVELOPMENT OF THE KNOWLEDGE ECONOMY

Dr. Firas Rifai

Al-Zaytoonah, University of Jordan

ABSTRACT: *The focus of this research is to bridge the gap between knowledge and action, which is known as (The Knowing-Doing-Gap); especially in the fields of new technologies. Although there are many discussions on this issue from a micro perspective – for example, Braun - focusing on a managerial approach in dealing with new knowledge, other researchers focused on the problem at the macro level introduced by Röpke. This research explores both approaches, Röpke’s and Braun’s, to find solutions for the Knowing-Doing-Gap problem on both levels, the Micro and the Macro. The research explored both methodologies and found that both approaches complement each other in providing a general solution to Knowing-Doing-Gap through transforming universities into entrepreneurial universities.*

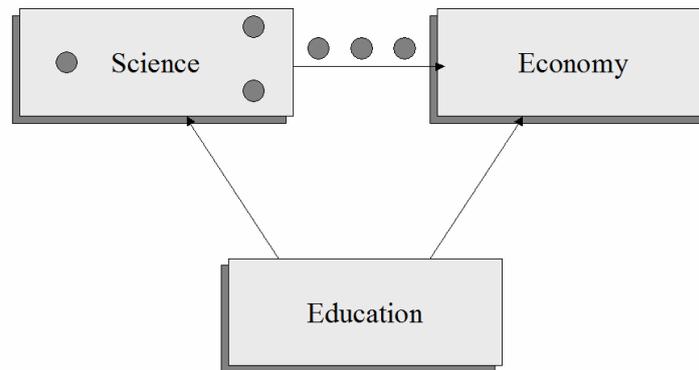
KEYWORDS: Knowing-Doing-Gap, Entrepreneurial University, Development, Economy

INTRODUCTION

In the information age and knowledge communities, natural resources and work are no longer considered as the basic economic resources and production factors. In increasing percentage, knowledge and human capital are considered as the most important variables and factors in the process of economic development and growth.

Where the transfer of knowledge from the scientific and research institutes (scientific research centers and universities) to the economic system (Market) is not given (blocked), the capacity and capability of produced science and scientific knowledge will stay very weak. That means wasting time, energy and resources.

The problem of the gap between knowledge and practice – *The Knowing-Doing-Gap*, describes the situation where the educational system is separated from the economic system (both systems are independent). Both systems are isolated in their performance and at the same time the output of the scientific systems and the scientific institutions (such as universities) will not find any practical application in the economic system (see chart 1).



The Knowing-Doing-Gap¹

The growing importance of the use of knowledge and its application to economic success reflects the growing importance of the concept of the knowledge economy (Knowledge Economy). According to Stehr, the difference between knowledge society and all previous societies is that in knowledge society, scientific and technological progresses are inseparable and specific to each other. Therefore knowledge societies are more powerful in various social activities (Stehr, N., 1994, P. 218, In: Combé, N., 2008, P. 1).

According to the reports from the United Nations Development Program (UNDP), the spending on research and development in Arabic countries is very low and normally used only to cover fixed costs. The number of patents registered in the United States from Arabs (approximately 320 million / statistics of 2007) in the years between 1980 and 2000 are about 370 patents, while in South Korea (48.5 million) registered about 16,300 patents. After focusing on the 370 registered Arab patents we found out that most of them originate from foreign scientists and foreign companies in the Arab world and not from Arabs (Rifai, F., 2010, P. 3 and AHDR, 2003, S. 70-73). South Korea was in the 1950s a poor nation where the living standard at that time was less than most of the countries of Latin America. The situation has changed in this country positively so that the GDP (gross domestic product) and the living standards in South Korea have increased dramatically and became comparable to industrialized countries.

The experience of South Korea relies primarily on science, knowledge and leadership in successfully and economically applying science and knowledge in the market (Rifai, F., 2010, P.9).

Generally and theoretically, knowledge generating and production should be positively linked with application of this knowledge in the economic system. But practically, this relation was not proven (Combé, N., 2008, P. 19). In fact the applied component falls behind the knowledge production component. In global economies under severe global competitiveness, the successful practice of knowledge and new technology is considered and economically commercialized as the deciding factor to open new areas of added value, with the highest rates of economic growth in pilot and innovative technological fields such as nanotechnology and biotechnology. So only the developing economies that have the capacity to bridge the

¹ Röpke, J., 2003, S. 5, In: Combé, N., 2008, P. 58

gap between knowledge and practice by converting knowledge into a profitable economic product, can be considered as successful economies and have a prosperous future (Combé, N., 2008, P.20).

To discover and exploit the opportunities of development and economic and social development the subject "applying the new knowledge in practice" must be considered in a serious and new manner. Through this paper we will attempt to show the role of the scientific system that produces knowledge and practice – especially universities – in the development process. We focus here on the following questions:

1. What is the future role of universities (as scientific institutions) and the possibility to contribute in supporting of entrepreneurship, creativity and innovation and development in general?
2. What are the conditions or circumstances that must exist in order to enable universities to play an active role?

Knowledge and the problem of its practical application

At first let's say theoretically that universities, because of their infrastructure and available resources and human capital, have the potential to play an active role in the development process, but that potential is not activated. This potential often remains untapped economically and that is a huge waste of the power of the universities themselves and wasting power also for the geographical areas where universities are located in.

This is not a coincidence but a result of the administrative structure and the cultural and organizational use and policies which affect the dynamics in universities negatively. These structures and policies mentioned above do affect the evolution and the dynamic development of universities negatively instead of the positive impact that universities should provide academically and economically.

When knowledge stays in isolation from application, it will never have any economic importance. Untapped knowledge remains of no value, and only through the practical application of this knowledge into the economic system will it have a positive impact.

Data, information and knowledge are considered in knowledge and information societies (economies in an era of information) as the most important determinants and factors for economic prosperity. In every organization, whether it is a company or a university or a public or private body, knowledge management is a key factor for success, growth and development. Nonaka says that at the time where the only certainty is the uncertainty, the only source of sustainable competitive advantage is knowledge (Nonaka, I., 1991, P. 96, In: Combé, N., 2008, P. 53).

We all know that the production factors are rare - limited - but knowledge as a production factor is different. Knowledge is not scarce, in fact it is increasingly available. The problem is in the implementation of this knowledge. The problem, as described above, is to implement this knowledge. The capacity to produce knowledge is getting bigger and bigger due to increasing scientific capacity in information processing (Information Processing).

The following figure shows the increase in scientific publications since 1700. This indicator shows that the amount of knowledge is increasing through time. In figure 2, the knowledge base in 2020 will be about 10,000 times bigger than today and about 300 million times bigger than the level in 1700 (Röpke, J., 2002, P. 23).

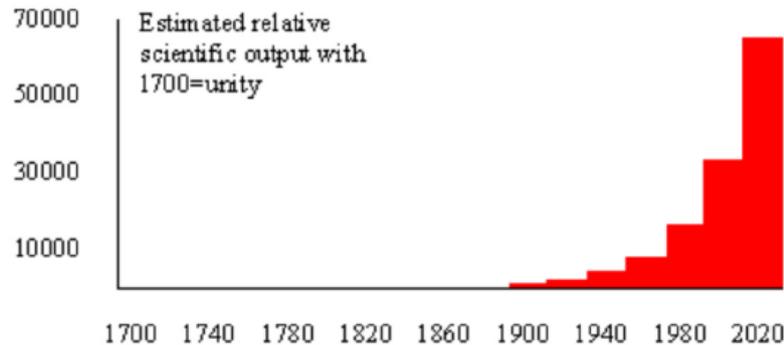


Figure 2: increase in knowledge output between the years 1700 and 2020²

The important question in this respect focuses on how to use the new knowledge practically and economically. From a macro-economy point of view can national economies (countries), and from a micro-economy point of view, can companies and institutions transform available knowledge and technologies to their competitive advantage? Can these states and corporations exploit and use available science and technology economically?

The avalanche in the production of knowledge and science cannot be fully implemented in practice. We have to try to implement what is possible and practicable.

The ability to use and implement new knowledge

From the standpoint of the logic of production factors (Input Logic) the “knowing Doing Gap” problem doesn’t exist. According to the Input Logic the application of new knowledge is always available, and new knowledge considered as the primary fuel for economic development and acceleration.

But the question is: who can apply this new knowledge practically and economically? Who has the ability, knowledge and competence for this process? The quick answer is that persons with high human capital (Human Capital) can transfer knowledge from the knowledge producing systems (Universities and Research & Development Institutions) to the knowledge implementing systems (Economic System) to get benefits and take advantage of this knowledge before it gets older and un-useful. This means that in addition to knowledge, human capital plays an important and key role in supporting the economy and moving both the economy and society to a knowledge economy and society.

The Terminology “Human Capital” is a qualitative expression and contains the work associated with the skills, knowledge, experience, and academic study. It is considered as a term of significant quality. On the other hand, the "Human Force" is considered a quantitative

² Sparrow, O. 2004, In: Combé, N., 2008, P. 59

expression, focusing on the numbers of workers, regardless of qualifications and experience. It is considered a term of significant quantity. In other words the new rare production elements for the new knowledge economy are knowledge and human capital.

For the process of transferring and implementing new knowledge into the economic system we need workers with very high skills, knowledge, experience, academic study (Human Capital), that way we increase the possibility of the successful transfer and implementation of knowledge economically and commercially at the market and earn many advantages.

The knowledge producing institutions, such as universities, can only contribute to the dynamics of innovation and development of economy and society if they are linked to the production knowledge with the market. That can be done through high human capital and entrepreneurs, who have special skills and can implement new ideas and knowledge into a product or service. The role of universities in the process of growth and regional development remains little and can be increased only if universities introduce an innovative and entrepreneurship own culture into its culture and policy (Röpke, J., 2002).

The purpose of this paper

Through this paper we try to deal with the problem of "the gap between knowledge and practice "The Knowing-Doing-Gap" and offer some possible solutions to this problem. In many references, we believe that research and articles that addressed this issue considered only the perspective of microeconomics (Pfeffer, J. Sutton, R.I., 1999, In: Combé, N., 2008, P. 61). Röpke was the first one, who dealt with this problem from the perspective of Macroeconomic (Röpke, J., 2003). Röpke focused directly on the role of knowledge and human capital and strength resulting from the integration of the entrepreneurial element. The success or failure of individual organizations or companies in the 21st century depends primarily on knowledge, human capital and the element of entrepreneurship (Caspers, R., 2002, P. 1, In: Combé, N., 2008, P. 1).

Through Röpke's research and thoughts that highlight how to solve this problem, "the gap between knowledge and practice" support and advance economic development in a sustainable manner.

The untapped potential of Developmental Universities

The future of economy in high-income countries such as Germany, Japan and the United States largely depends on the skill and competence and the desire for liberty in pioneering and innovative activities. Only when they can open up new markets and develop new products and services, increase productivity, they will enhance their competitive strength at the international level and maintain their economic and technological superiority. The pioneering and innovative activities by themselves, based on the creation, application and dissemination of knowledge and new technology, are increasingly relying on knowledge rather than the classic production elements (land, labor and capital) as specific elements and add value to production and influence national and international competitiveness (Aßmann, J., 2001, P. 65).

That competitive advantage in the industrial states are derived largely from the goods and services of scientific and technological characters. At present science and knowledge in goods and services produced in the industrialized countries comprise more than half of the

total production costs and this percentage continues to grow (Albach, 1997; Nefiodow, 1996. In: Assman, 2001, P. 65).

The proportion of the above is based on the following background; a number of questions need to be answered later in this research:

1. How to use and exploit the potential for growth and development in the scientific system?
2. What are the institutional changes which must be considered as key requirements for opening the transfer, exploitation and advantage of available knowledge and technology available economically and successfully?
3. How to convert a University from strictly scientific foundation to an entrepreneurial university?

Universities in the light of the logic of inputs (Input-Logic)

The ordinary teaching way and system, and the present academic outputs of the universities are almost sufficient for getting an ordinary job with a certain salary, and also enough for adjustment with the environment. But these teaching systems and outputs are by far not sufficient and not enough to face all the increasing challenges in this dynamic environment and knowledge society, and its growing complexity.

The most dominant thinking way in this case is the "Input Logic", which states that to increase output (goods, services or scientific research) we have to increase input (money, teachers and researchers). This logic "input logic" also assumes that science and knowledge are freely available and can be used economically without any hindrance. This logic assumes that the increase in new science and good knowledge (inventions and patents of inventions) will automatically lead to an increase in value added. This logic is far from realistic because to turn ideas and knowledge into a marketable commodity in an economically profitable way is not easy, and requires a lot of high skills and qualifications.

From the point of view of the classical school of "input logic", the role of universities, in supporting the regional economy is largely limited by supplying inputs related to entrepreneurship such as knowledge, technology and innovative ideas, and also qualified human resources and infrastructure (laboratories, rooms, etc). This means that the "input logic" greatly affects the decision-making within universities. If the universities want to increase their output, such as graduated students, knowledge and research papers and so on, they need to initiate more resources (inputs), such as money, personnel, equipment and buildings. By operating on the basis of input logic, as well as trying to support the development process through this logic. The universities are wasting so much potential and inherent strength, which they could use to develop themselves and their environment in better and more effectively way.

Universities in the light of the logic of innovation and entrepreneurship (Innovation Logic)

The corresponding pole of the input logic is the "innovation logic", which was introduced for the first time in this context by the scientist Joseph Alois Schumpeter in his book "Theory of

the Economical Development” in 1911. Schumpeter focuses on the role of the entrepreneurs in implementing new ideas and new knowledge economically in the market. He emphasizes the role of invention and innovation and especially the very important role of the entrepreneurs in leading the implementation process of new knowledge and ideas (Schumpeter (1912/2006), P.104).

The knowledge economy we live in today doesn't depend on simply the production of science and technology, but mainly depends on the use and application of this new knowledge to new products, new production methods, increasing productivity and more effective organizational forms, as Schumpeter said 100 years ago (Entrepreneurship). Therefore, to analyse and explain the progress and growth in economically successful communities (industrial countries), we must replace the thinking way of “input logic” with “Innovation logic”.

According to these results (Input Logic vs. Innovation Logic) we can say that universities are able to implement the innovation logic and develop themselves and the region where they operate.

So we come closer to the solution of the “Knowing Doing Gap” problem when universities operate by using innovation logic. Classical universities have to turn into entrepreneurial universities and have to change their structure and policies to be able to introduce the innovation culture and deal with it.

Only if these conditions are met and implemented, universities can act in a real way - based on production and application of knowledge through innovation logic - as a strong supporter for the development process. The question is: what qualifications and skills do the universities require in an entrepreneurial university? To answer this question we review types of businessmen and the extent of their influence on the development process.

Types of Businessmen³

As explained above, universities should enter the entrepreneurial factor alongside academic teaching and scientific research to unleash the untapped potential. Universities must act in this manner. How should this action look?

There is more than one way and there is more than one kind of businessmen. Every kind has his own way and has his own goals and somehow different principles. Different ways of implementation have different effect on their environment, be it a university or the market or even the whole economy.

To explain and to show the difference between the different types of actions and their impact and influence on the development process we go back to Schumpeter's word. According to Schumpeter, Röpke explains that there are several types of businesses with different functions in terms of the nature of their work and their impact on the development process, where they perform.

According to the ideas of Schumpeter, he classified Röpke (Röpke 2000) businessmen into four types, four different functions and also shows the various influences on the economy:

³ Rifai, F., 2010, P. 30-33

routine business (Routine Entrepreneurs), **merchant** (Arbitrageur), **entrepreneurs** (Innovators) and **self-developer** (Evolver - Evolution).

Röpke believes that these four types of business are on different hierarchical levels and perform different functions, which differ in terms of their impact on economic development. Through the personal effort of each kind of businessmen, every business can develop itself and move to a higher level in the hierarchy. This development is possible but at the same time is very difficult. This raises the question: which kind of businessmen does have the necessary groundwork and have the most impact on the economy, growth and development?

To answer this question accurately we have first to explain the differences between all these four types and their functions (Röpke 2000):

Routine Businessmen: as its name states (routine), routine businessmen do routine activities and keep checking the usual stereotypical activities in their lives. Outside their usual environment they will face challenges and make errors.

Their main aim is to ensure that the situation will stay as is, secure future and ensure a stable supply (Röpke, 2000). Routine businessmen have little influence on economic development and limited skills on routine tasks so that their energies and abilities do not allow them to do more (Schumpeter, 1993, P. 351 and Röpke, 1992, P. 3-5).

The starting point of the **Arbitrageur** is the imbalance in the market caused by entrepreneurs through entering a new commodity or something new to the market. That imbalance in the market leads to price and/or quality differences in the markets (national, regional, international), which gives the merchant a chance to take advantage of these differences and turn them into profit. In the absence of entrepreneurs and its innovative work in the economy, the economy remains in balance and therefore the job of the arbitrageur will fall in danger, because the market differences disappear. The role and contribution of arbitrageurs has no effect on the development process because they discover and exploit opportunities only and they do not create these opportunities.

Entrepreneurs who have already been mentioned previously are characterized through the so-called "Creative Destruction" and their mission is characterized by the use of available resources (production factors) through the principle of "New-Combination of the available Production Factors". This new combination leads to production of new products or services or introduce new production methods or new markets etc. Through the use of available resources (production factors) in a new way "combination" entrepreneurs will gain competitive advantages, which affect their performance and the profitability positively. The process of applying new ideas successfully requires a specific type of businessmen, which will be called by Schumpeter as a "dynamic businessman". This entrepreneurship is an interdisciplinary work and risky, so they are somehow not ordinary persons and consider themselves as a primary engine of economic development (Schumpeter, 1964, P. 111. In: Rifai, F., 2010, P. 32).

Röpke cautions that developing entrepreneurial qualities is strongly required; otherwise the entrepreneurial advantages will decrease over time. In extreme cases entrepreneurs will turn into arbitrageurs or routine businessmen. To avoid this fall into lower levels, entrepreneurs have to develop their entrepreneurial skills and qualities and try to climb up to the fourth level (Evolution) of self development to keep their entrepreneurial skills over time and in

defiance of changing and challenging environment and circumstances (Röpke, 2002, P.89. In: Rifai, F., 2010, P. 32-33).

Business developers (Evolver) are businessmen, who are able to develop themselves and learn continuously and have the competence and capability to develop themselves and their energies and skills independently. These kinds of businessmen can work on all four levels mentioned above and are considered as the most important booster for economic development (Röpke 2002, P. 87 ff.).

Solutions to the problem of "the gap between knowledge and practice" (The Knowing-Doing-Gap)

At present, we find a lot of solutions that help apply available science economically and thereby create a comparative advantage and bridge the gap between knowledge and practice (Creuznacher, I., 2009).

In this paper the author will review some of the available solutions, but in return we will review extensively the proposal of Röpke "The Entrepreneurial University" and the proposal of Braun "The Intelligent University".

Incubator

The solution to overcome the gap between knowledge and practice, as is the practice in the United States, is entering university incubators (Malek / Ibach, 2004, P.117 ff. In: Creuznacher, I. 2008, P. 192). The definition of a real incubator is a device through which we could find and create the necessary conditions that affect the growth process for a newborn. For the economy and the development process, the definition of the incubator is a place, where businessmen can be supported in their economic and educational activities through the provision of infrastructure, technical and administrative, advisory services and other related services (Röpke, J., 2002, P.328.). In other words, the incubators are a way to help new projects (Start-ups) in the early stages (Pre-Seed/Seed-phase) (BMW (2006), S.6. In: Creuznacher, I., 2008, P. 192).

MAFEX⁴

MAFEX was established in 1998 and has its offices in the Faculty of Economics and Business Administration at Philipps University of Marburg, in Germany. MAFEX is a non-profit company (Join Venture) and specializes in supporting pioneering ideas and new entrepreneurial projects coming from students and staff of the Philipps University. The main goal of MAFEX Centre is to support pilot projects and entrepreneurial ideas through lectures and training programs and provide individual support and advice with a view to moving sciences from the university to the successful economic practicalities. Through its program, MAFEX tries to close the gap between knowledge and practice by linking science and scientific research institutions (the university) with the economic system.

⁴ Marburger Institut für Innovationsforschung und Existenzgründungsförderung - www.mafex.de

University as a way out of the problem of the gap between knowledge and practice

At this point we highlight the universities as a way out of the problem of the application of available science and technology. To enable universities to do this transformation and this difficult and important job at the same time, the political decision-makers in the State have to open new ways for the universities through new instructions, policies and laws, which support entrepreneurship and innovation. Policies and enactment, which hinder entrepreneurship and limit the freedom of action of universities, must be changed. In addition the role of the staff and administrators of the Universities cannot be ignored. The university administration has to develop its efficiency to develop and introduce an appropriate and supportive culture for entrepreneurship and innovation. With regard to the teaching staff, the challenge of teaching and scientific research focuses on self-development and to try to deliver the entrepreneurial characters to the student through lectures, workshops and seminars (Braun, G., 2004, P.61 f. In: Creuznacher, I., 2008, P. 199).

In this research paper the author will review two proposals to solve the problem of the gap between knowledge and practice through the universities. These proposals show that they are not contradictory or competing with each other but they can be seen and evaluated as complementary.

The first solution is from the economist Röpke, who tries to link universities structurally with scientific institutions and economic systems (Macro-Level). So science and knowledge can find their way into application in the economic systems and markets and thereby bridge the gap (Röpke, J., 2009).

The second proposal is from Braun and acts in the Micro-level of economics. Braun focused on the whole entrepreneurial potential inside universities and their innovative capacity.

Entrepreneurial University – Röpke⁵

Most universities are based on the ideas of Humboldt (Humboldt-ideal) which considers that the ideal task of the university lies in teaching and scientific research. But this ideal, as defined by Humboldt, stands as a barrier in linking universities, science and an economy system structure with each other. This ideal supports keeping knowledge only in universities and not for application in specific cases. Röpke describes the knowledge and science in the universities that did not find its way to the economics system as dead-knowledge and science.

For the use and implementation of new science and new technology, researchers must also be businessmen at the same time and have the ability and desire to implement their new knowledge. The entrepreneurial skills of young scientists and the next generation is the key to link the scientific institutions with economic systems and transform communities to entrepreneurial communities and knowledge societies. Thus, the process of producing knowledge with tangible benefit and closing the gap between knowledge and practice depends primarily on the entrepreneurial qualities and skills of scientists working in scientific and research institutions (Röpke, J., 1998, P.85. In: Creuznacher, I., 2008, P. 191).

Röpke has developed the Humboldt-Ideal and the principles of Humboldt through adding a third factor to the two main factors “teaching and research”. Röpke introduced the factor “Entrepreneurship” and said that universities have to stand on three legs instead of two,

⁵ Röpke, J., 2009

(education, research and entrepreneurship). The engine and fuel of economics is not the knowledge per se, but the ability to apply this knowledge successfully and profitably in the market (Röpke, J., 2001, P. 2. In: Creuznacher, I., 2008, P. 191). The structural link between knowledge systems and economic systems is the seed and the origin of the knowledge society and entrepreneurship.

Röpke mentioned four conditions and requirements to successfully structure links between the scientific, economic and social system. If these different systems are successfully linked together, new science and knowledge will find its way to the market.

The main hypothesis of Röpke's suggestion is that the science system (scientific research institution and universities) and the economic system are separate and independent from each other but at the same time affect each other negatively and positively (Röpke, J., 2001, P. 301. In: Creuznacher, I., 2008, P. 199).

The four conditions or phases which Röpke suggested can be achieved separately or together at the same time. These terms are arranged intentionally and mean that each condition includes the condition or conditions that precede it. This also means that entrepreneurship will increase from one stage to the other.

Conditions or stages:

1. Physical inputs: here we focus on providing the required input - appropriate infrastructure at the universities to support new and entrepreneurial projects such as technological centers (Technology Parks). These technology parks support new start ups through the available resources (computers and other material resources) as well as giving advice and administrative support.
2. Academic requirements: universities have to try to expand their mission (teaching and research) through introduction of the entrepreneurial element. To implement this, universities have to introduce the theories, principles and ideas related to innovation and entrepreneurship to different approaches of lectures on entrepreneurship or even create a department of entrepreneurship and innovation.
3. Training: training of owners of new startups. We focus here on the strength of personal skills and increasing the capacities and knowledge and practical skills of the owners of new startups through targeted training programs. In this training, new entrepreneurs will get multidisciplinary knowledge and training methods to help them develop their own entrepreneurial characters and qualities.
4. The supporter (Catalysis): here is an attempt to make universities as a major supporter for the development of the geographical area, where the university is located. We try to link universities directly with other systems (economics, law, education etc.) and try to let universities get political support and/or get support from companies, which get benefits from transforming universities into entrepreneurial universities (Röpke, J., 2009).

There are many institutes and universities, which have applied this idea (entrepreneurial university) successfully such as "Massachusetts Institute of Technology - MIT⁶" in Boston

⁶ <http://www.mit.edu/>

and Tsinghua University⁷ in China. That shows us that the idea of entrepreneurial university can be applied and is not only possible but can be successfully applied too. The main objective is to achieve the optimal use of available technology and science to earn benefits economically and support the entire society.

In Germany, the cooperative network between BayME⁸ (Association of the Bavarian metal and electrical entrepreneurs) and VBM⁹ (Association of Bavarian metal and electrical industries) is an example of that. This cooperative network builds together with TUM¹⁰ (Technical University of Munich) and FAU¹¹ (Friedrich-Alexander University) a "Technology Bridge" which includes all components required to bridge the gap between theory and practice by practice¹².

These terms and requirements mentioned by Röpke can be achieved together. Furthermore the academic teaching and scientific research do not conflict with the entrepreneurial element. Academic teaching, scientific research and entrepreneurial elements can be integrated together side by side and, as a result, we create the capacity for the actual production of entrepreneurship.

Intelligent University (Braun)¹³

The proposal of "Intelligent University" by Braun is not to describe the problem of structural linkage of universities with their environment, but it puts the focus the internal structure of the universities and the balance between the motivation and resources; Motivation of doing entrepreneurial activities by the administrative staff and the availability of required resources (inputs and infrastructure - Resources). Braun's proposal identifies two key factors as conditions for the internal change process required for universities:

1. The inclination, desire and will to entrepreneurship (Motivation for innovative behavior)
2. Capacity for entrepreneurship and innovation (resources, structure).

Based on these conditions, there must be a balance in the universities between the desire and will of the staff and the available resources (infrastructure) to let universities be able to be entrepreneurial universities.

Braun believes that a lack of required resources and infrastructure is hostile and not supportive of entrepreneurship and would hinder all attempts to reach the main entrepreneurial and innovative goals in the universities. Also Braun believes that a lack of the

⁷ <http://www.tsinghua.edu.cn/publish/then/>

⁸ Bayerischer Unternehmensverband Metall und Elektro e.V.

http://www.baymevbm.de/agv/bayme_vbmDie_bayerischen_Metall_und_ElektroArbeitgeber--1.htm

⁹ Verband der Bayerischen Metall- und Elektro-Industrie e.V. [http://www.vbw-](http://www.vbw-bayern.de/agv/vbwDie_bayerische_Wirtschaft--13142.htm)

[bayern.de/agv/vbwDie_bayerische_Wirtschaft--13142.htm](http://www.vbw-bayern.de/agv/vbwDie_bayerische_Wirtschaft--13142.htm)

¹⁰ Technical University of Munich <http://www.tum.de/>

¹¹ Friedrich Alexander University <http://www.uni-erlangen.org/>

¹² Actions to support this cooperation:

- 1- Offer consulting service in technology matters
- 2- Use the technical equipment of the university
- 3- Offer meeting and knowledge exchange between university staff themselves and entrepreneurs from outside the university in order to create a strategic plan.

¹³ Braun, G., 2004, P.51 f. In: Creuznaacher, I., 2008, P. 205

desire, the will or of the motivation of the university staff has a negative impact on reaching the entrepreneurial goals in the universities.

To understand and analyze these parameters in a better way, Braun links the mentioned conditions (the organizational structure of the University and entrepreneurship) with five additional variables:

According to Braun, the organizational culture and the university administration and faculty teaching staff are considered as the determinants of creating desire and motivation for entrepreneurial activities. In addition, organizational culture and infrastructure (resources and potentials) are considered as the determinants of capacity and capability of the universities to implement entrepreneurial activities successfully.

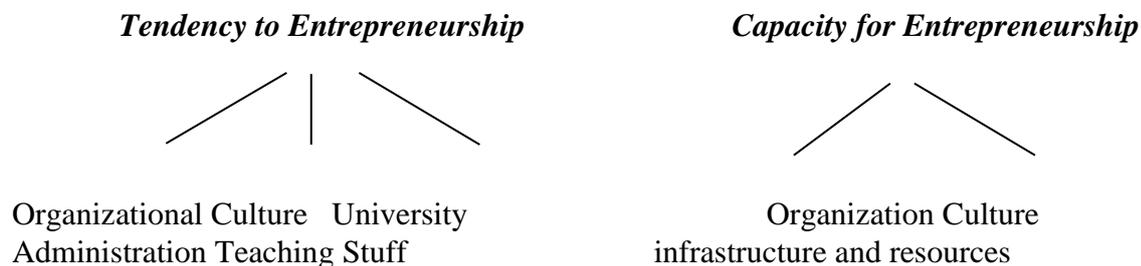


Figure 3: the determinants of entrepreneurial University

We can differ between a supportive or disempowering organizational culture of entrepreneurship. The appropriate and supportive management for entrepreneurship calls leadership and not just management. Based on references in management, leadership means defining the strategic direction of the universities and potential development. In addition to management skills, the successful leadership in the university has to have high skills in science and research (Braun, G., 2004, P.58. In: Creuznacher, I., 2008, P. 205 f.).

The ability to think globally for the entire system, to deal with risk, to communicate with others (internally and externally) and the ability to establish a shared vision are the most important qualities, which leadership must have. On a practical level, where there is the physical connection with potential entrepreneurs, we can see the importance of faculty staff research and the extent of their expertise and professionalism, because they are the most important elements of the entrepreneurial universities, especially if universities are in a competitive mode.

According to Braun, the highly qualified persons, who are able to move on to successfully transform universities to smart universities, must have four qualities and skills, which are similar to the evolutionary businessman (Evolver) as showed previously (Braun (2004), S.62 f. In: Creuznacher, I., 2008, P. 207 - 208):

1. The development and formulation of a personal vision: the power and the will of personal vision and desire to achieve this vision is a perfect and positive drive for regulatory and structural change.
2. Questioning all current things and always trying to improve them and the attempt to apply the principle of continuous learning and keeping it as a principle.

3. Striving for self-improvement such as taking successful entrepreneurs as a model and trying to pursue all available resources to make a difference.
4. The capacity for collective action: the mission of teaching and research is an interdisciplinary, difficult and complex job. It requires teamwork with colleagues and students. In addition the ability to work as a team together with other teams of other organizations is a prerequisite for the establishment of a collaborative network. That way we increase the ability for structural bonding with other systems (universities).

The common element between Röpke's proposals and Braun's proposal is that the provision of the required resources and infrastructure meets the requirements of the inputs logic. This is not sufficient to convert the universities as a scientific and academic institution into an entrepreneurial university, where new knowledge and science can be implemented.

In addition, to providing the universities with the necessary inputs and adequate infrastructure, Röpke and Braun focus on the teaching staff and administration staff and their empowerment to enable them to improve their skills by themselves.

In addition to all mentioned actions and skills, which universities have to do and have to have, the university administration must be committed to continue developing the culture of entrepreneurship within universities which support entrepreneurial skills and business. The harmony and coordination between external variables (Röpke) and internal variables (Braun) for the desired change in universities can be achieved only by harmony and coordination between a group of friendly and supportive policies for entrepreneurship, innovation and ensuring high quality resources (inputs) and suitable university culture (Braun, G., 2004, P.51).

As a result, we can say that Braun's proposal complements the proposal of Röpke and soothes its way. The internal transformation (Braun) of the universities is very important to let universities go outside toward science and economics systems and do their entrepreneurial role.

The integration of the two above mentioned proposals of Braun and Röpke gives us a comprehensive solution to bridge the gap between knowing and doing. This comprehensive solution focuses in the first step on strengthening universities from inside and changing the organizational structure to support transformation to entrepreneurial structure, and increasing the desire and ability of faculty staff and university administration. After the completion of the internal arrangement of entrepreneurship universities can go out and start a structural link with external systems with a view to transferring knowledge to those systems.

In General, the process of bridging the gap between knowledge and practice required, according to Braun and Röpke and from a micro and macro point of view, the following steps in brief:

1. The desire, the will and the vision of entrepreneurship
2. The capacity for entrepreneurship
 - a. Physical inputs

- b. Scientific and practical capacity and developing the required skills
 - c. Organizational structure supportive for entrepreneurship
 - d. Leadership rather than management
3. Academic: expanding the Mission of the University (teaching and research) and introduce the entrepreneurial element.
 4. Training: the strengthening skills of personal, academic, scientific and practical skills for all university members.

SUMMARY AND OVERVIEW

The gap between knowledge and practicing, considered as one of the most important problems of today because of its significant impact on the process of economic and social development in general. This issue describes the inability of the science and economic systems to work together in order to apply the outputs of scientific institutions in the economic system. Economic systems and scientific and educational systems are independent of one-another, therefore outputs of science systems will face challenges and difficulty in accessing the economic system and thus not be able to be implemented in practice.

The role and function of universities is limited to the academic teaching and scientific research, therefore universities are considered as a closed system and not open to the economic system where they can transfer knowledge and science and implement it successfully in the market. But at the same time, there is no doubt that knowledge institutions such as universities can make a significant contribution to the development process by linking science (scientific research) with the economic system and thus create and support the knowledge economy.

When the science system is able to use and implement the knowledge produced successfully, this system will create new knowledge, new technology, high skilled human capital and innovative ideas. Those institutions can support and accelerate regional development through entrepreneurship and innovation and high skilled human capital. This fact is especially true for universities because of their scientific nature. Scientific research is the major source of entrepreneurial and innovative ideas.

However, the universities, which want to promote the creation of entrepreneurship and knowledge societies, have to start from the inside and start learning and introducing the element of entrepreneurship and innovation in the culture of academic teaching and scientific research. Universities have to abandon the Input-Logic and start using innovation logic and use available resources in a new form (New-Combination) and start the transformation process into entrepreneurial universities. That way universities can bridge the gap between knowledge and doing (practice) and support the implementation of new knowledge practically and economically in the market.

REFERENCES

- Albach, H., 1997: Wissensbasierte neue Produkte für den globalen Wettbewerb der Zukunft, in: FAZ, Ausgabe vom 15.12.1997, S. 5.
- Aßmann, J., 2004: Innovationslogik und regionales Wirtschaftswachstum. Theorie und Empirie autopoietischer Innovationsdynamik. Marburg, Bod: Mafex Publikationen Band 5/2003.
- BayME Bayerischer Unternehmensverband Metall und Elektro e.V. http://www.baymevbm.de/agv/bayme_vbmDie_bayerischen_Metall_und_ElektroArbeitgeber--1.htm
- BMWi, 2006: (Bundesministerium für Wirtschaft) (Hrsg.), Gründerraum und Inkubator – was kommt heraus?, exist 01/2006
- Braun, G., 2004: Die Universität als Produktionsstätte unternehmerischer Selbständigkeit, in: Gründerflair MV (2004) S. 51-111.
- Caspers, R., 2002: Gesellschaftliche Bedeutung von Wissen und Wissensnetzwerken, Working Paper No. 2, Oestrich-Winkel
- Combé, N., 2008: Der Knowing-Doing-Gap im Innovationsprozess postindustrieller Gesellschaften. Eine entwicklungsdynamische und evolutionsstrategische Analyse. Books on Demand, Norderstedt
- Creuznacher, Isabel, 2008: Persönlichkeitsentfaltung zu unternehmerischen Fähigkeiten: eine bildungsökonomische Antwort auf theoretische Zielvorstellungen von Schumpeter. Books on Demand, Norderstedt.
- Malek, M./ Ibach, P.K. (2004), Entrepreneurship. Prinzipien, Ideen und Geschäftsmodelle zur Unternehmensgründung im Informationszeitalter, dpunkt.verlag GmbH, 2004
- Meyers, 2003: Meyers Großes Taschenlexikon in 26 Bänden, 9. neu bearb. und erweiterte Aufl., Mannheim, 2003
- MIT Massachusetts Institute of Technology) MIT <http://www.mit.edu/>
- Nefiodow, L.A., 1996: Der sechste Kondratieff. Wege zur Produktivität und Vollbeschäftigung im Zeitalter der Information, St. Augustin.
- Nonaka, I., 1991: The Knowledge-Creating Company, in: Harvard Business Review, 1991, S. 96
- Pfeffer, J./Sutton, R.I., (1999): The Knowing-Doing Gap – How Smart Companies Turn Knowledge into Action, Harvard Business School Press, 1999
- Rifai, Firas et al., 2012: Business Angels Financing of Entrepreneurial Projects in Jordan, in: European Journal of Social Sciences ISSN 1450-2267 Vol.32 No.2 (2012), pp. 277-289
- Rifai, Firas, 2010: Unternehmertum, Humankapital und Innovation in der wirtschaftlichen Entwicklung J O R D A N I E N s, Marburg (Lahn) 2010
- Röpke, J., (2002): Der lernende Unternehmer, Marburg
- Röpke, J., (2003): Transforming Knowledge into Action – The Knowing-doing Gap and the Entrepreneurial University, Bandung/Marburg, 2003
- Röpke, J., 1992: Cooperative entrepreneurship dynamics and their promotion in self-help organizations. Marburg Consult für Selbsthilfeförderung, Marburg.
- Röpke, J., 2001: Zur Förderung von akademischen Unternehmensgründungen, überarbeitetes Vortragsmanuskript Fachkonferenz *Wissenschaft und Wirtschaft im regionalen Gründungskontext*, Fraunhofer Institut Systemtechnik und Innovationsforschung: Karlsruhe, 5. und 6. April 2001
- Röpke, J., 2009: Transforming knowledge into action - The knowing-doing-gap and the entrepreneurial university

- Schumpeter, J. A., 1911: Theorie der wirtschaftlichen Entwicklung. Eine Untersuchung über Unternehmergeinn, Kapital, Kredit, Zins und den Konjunkturzyklus, Nachdruck der 1. Auflage von 1912. Duncker & Humblot, Berlin
- Schumpeter, J. A., 1993: Theorie der wirtschaftlichen Entwicklung. Eine Untersuchung über Unternehmergeinn, Kapital, Kredit, Zins und den Konjunkturzyklus, 8. Aufl. Duncker und Humblot, Berlin.
- Sparrow, O., (2004): Scenarios for 2020, URL: <http://www.chforum.org/scenarios>
- Stehr, N., 1994: Arbeit, Eigentum und Wissen. Zur Theorie von Wissensgesellschaften, FFH a. M., 1994, S. 218
- Tausend, C., 2004: Fostering Entrepreneurship – The ODEON Center for Entrepreneurship at the University of Munich, August 2004
- Tsinghua University <http://www.tsinghua.edu.cn/publish/then/>
- VBW Verband der Bayerischen Metall- und Elektro-Industrie e.V. http://www.vbw-bayern.de/agv/vbwDie_bayerische_Wirtschaft--13142.htm