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CREATING
ENTREPRENEURAL
MINDSET
CREATING ENTREPRENEURIAL MINDSET

edited by
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Preface

We are all living in a dynamic and fast changing socio-economic environment. The issues underlying the process of transforming environment are, *inter alia*, changing social norms and behaviors, structure and culture of organizations, social attitudes and informal institutions. Henceforth, it becomes essential to develop extensively personal skills and capabilities, to get new knowledge on how to benefit effectively from various opportunities, which arise.

Entrepreneurship, combined with entrepreneurial skills, are nowadays perceived as one of the most desired in today’s world. However, despite existing broad evidence on different aspects of entrepreneurship, which may be traced in a body of theoretical literature, the question on how to create and support entrepreneurial activities, attitude and norms, still remains unanswered. In theoretical works, there may be found substantial trials of identifying and defining the most effective techniques applied to develop extensively entrepreneurial skills. In addition, the public debate on elaboration of support system for companies and other institutions still takes place on various grounds.

The main value of this book consists in providing new perspective on the process of creating entrepreneurial attitudes and norms, putting special emphasis on the various issues associated with entrepreneurship teaching. This novel book ‘Creating Entrepreneurial Mindset’ provides deep insight into seminal issues intimately related with entrepreneurship teaching and different aspects of entrepreneurship, like e.g. human resource management or creation and adoption of innovations. Throughout this book, we offer new and fresh insights into ‘doing business’ – in a broad perspective, which leads
the reader toward better perception of different entrepreneurial behaviors. Understanding the problems that today’s entrepreneurs are constantly forced to manage, is what enables us to account for diverse performance of companies in modern and fast changing environment.

We are deeply convinced that the book ‘Creating Entrepreneurial Mindset’ helps the readers to understand better all aspects of entrepreneurship, which shall positively influence their perception of entrepreneurship, entrepreneurial skills and attitudes. We believe that the stock of knowledge constituting the content of the book, richly described cases and seminal aspects of entrepreneurship and entrepreneurship teaching, will provide the readers a solid background which may overlay different interpretations and implicate future transformation and shifts on the field of entrepreneurship.

Editors

Ewa Lechman & Anita Richert-Każmierska
1. Introduction

The purpose of this chapter is to demonstrate the importance of business and education to collaborate more closely to narrow the growing global skills gap which exists today (McKinsey Global Institute, 2012) in order to improve business performance in an era of hypercompetition (Christiansen & Sezerel, 2013). This chapter will examine how education levels differ in two very diverse nations (Turkey and the USA), and how effectively these nations are addressing the global skills gap. Education systems are the cornerstone of training people to meet the demands of the global job marketplace today (Biçerli, 2011). In an era of the “Knowledge Worker” and the “Global Labor Pool” (Drucker, 2002), these systems must effectively train their constituents so they possess a rather different set of skills and personal qualities than were necessary in past generations. Some of the more obvious skill set examples include foreign languages, computer literacy, communications, planning and organization, or quantitative analysis.

However, the changing nature of job positions worldwide is also requiring qualities beyond these skill sets to include cultural adaptability, initiative and leadership,
objectivity and integrity, critical thinking and judgment, teamwork, and information integration (US State Department, 2014). Therefore, educational systems must reflect these realities with a paradigm shift in thinking to create new programs or upgrade current ones which develop these qualities and skill sets so workers can compete effectively with the global labor force. This holds true for all nations (The World Bank, 2012).

Currently there are 3.3 million students worldwide studying in a country beyond their own (Macready & Tucker, 2011). With such a diverse array of foreign nationals attending educational institutions globally, the teaching profession must continue to attract and retain instructors who are more effectively trained in and aware of the different learning styles attributed to the “global classroom” that exists in many countries. However, one of the counter-juxtapositions of circumstance now is the while the demand for international education is high, teachers with global competence remain relatively few in number. To reach the necessary transcultural level of interaction required in the global classroom of today, it is necessary to review a hierarchy of terms broadly defining cultural relations (VanHook, 2005):

- Monocultural: cultures are segregated into their own homogenous cultural group
- Multicultural: various cultures are gathered together in the same room
- Crosscultural: various gathered cultures are talking at one another
- Intercultural: various gathered cultures are communicating with one another
- Transcultural: various cultures have moved beyond their cultural variations into common ground, transcending cultural differences

This topic will be explored further in the Conclusion with the discussion on Culturally Responsive Teaching (CRT).

Peter Drucker, who academia and business alike considered the world’s main authority on the field of business management until his passing in 2005, viewed contemporary globalism as one of profound transition—potentially even more influential than the extensive structural changes triggered by the Great Depression of the 1930s or even World War II (Drucker, 2002). He coined “Five Certainties” which would be the foundation of business—and consequently educational—strategy in the 21st century: 1) global competitiveness; 2) the collapsing birthrate in the developed world; 3) a re-definition of corporate performance; 4) major shifts in the distribution of disposable income; and 5) the growing incongruence between economic and political reality. Today, these very issues are transforming the global workplace very quickly in ways relatively few people today truly understand (Greenspan, 2008; Tyson, 2009).

In addition to these realities, the global economy is further developing into a system of “region-states” and trading blocs such as the Baltic Corner (Estonia, Latvia, Lithuania), BRIC (Brazil, Russia, India, China), and CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) that will vie for economic supremacy in the
coming years (Ohmae, 2005; Allen, 2011). In fact, the BRIC economies together are rapidly approaching the range of the original “G-7 nations” (Canada, France, Germany, Italy, Japan, United Kingdom, USA) in terms of total size (Goldman Sachs, 2011). The indications here should be self-evident.

Therefore, developing workers with the skillsets and qualities outlined earlier to compete on par with other workers in entities such as these will be imperative to sustainable economic, national, and worker success.

There are six disruptive shifts beyond the realm of governmental control which will be highly relevant to future work skills (Institute for the Future for University of Phoenix Research Institute, 2011), and thus demand lifelong learning which should ideally be developed from childhood:

- Extreme Longevity: Increasing global lifespans means multiple careers will become commonplace, and occupational change will necessitate lifelong learning
- Rise of Smart Machines & Systems: Workplace automation will continue to nudge human workers out of rote, repetitive tasks and impact every domain of our lives
- Computational World: Massive increases in processing power will make the world a programmable system on a scale never before possible
- New Media Ecology: New communication tools will require new media literacies beyond text, and completely transform the way in which we communicate
- Superstructured Organizations: New social technologies will drive new forms of production and value creation beyond traditional organizational boundaries
- Globally Connected World: Increased global interconnectivity will place diversity and adaptability at the center of organizational operations

Beyond these six drivers, it is also important to consider other effects of accelerating globalization such as rising environmental concerns, threats to social stability and order, the expanding impact of technology, and the imperative to increase productivity especially in the advanced economies (IBM, 2008). All of these factors will make destabilizing cycles of volatility more likely than ever before. It is worth highlighting that the first half of the 21st century will be the first time in 200 years when emerging-market nations will contribute more to growth than the developed countries (McKinsey Quarterly, 2010).

Due to the many factors above, it is important to turn our attention now to some specifics regarding education. Below is a brief investigation of the current educational systems of two very different economic, geopolitical, and social countries from which some analyses and suggestions will be explored in the Conclusion: Turkey and the USA. These nations shall most likely either gain or retain very important positions in the global geopolitical landscape during the first half of the 21st century (Friedman,
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Therefore, their respective educational systems are highlighted for the purposes of this chapter.

2. Turkish Education System

Education in Turkey is a state-supervised system which has its roots in the Atatürk Reforms following the Turkish War of Independence (1919-1923). The Ministry of National Education governs pre-school, primary school, and secondary school education, while the Council of Higher Education (YÖK) plans, coordinates, and supervises higher education (Turkish Fulbright Commission, 2012). Compulsory education begins at the age of six and continues to age 14 regardless of gender. It is free-of-charge in state schools. The Primary Education Diploma (İlköğretim Diploması) is awarded upon successful completion of the 8-year basic education program.

Secondary education has been a duration of four years since 2006, and is categorized into General, Vocational, and Technical High Schools. The so-called “Anatolian High Schools” are unique in that they provide regular class lessons in a foreign language—namely, English, French, or German—and are also divided into Fine Arts and Religious (İmam-Hatip) entities. Vocational High Schools focus on a certain profession such as tourism or industry, while Technical High Schools focus on science education (Turkish Fulbright Commission, 2012). Since 2010, high school graduates sit for the Transition to Higher Education Examination (YGS) in April; successful YGS candidates can then take a second-round examination in June—the Undergraduate Placement Examination (LYS). Those students who pass only the YGS exam can enter 2-year (associate) degree programs, while successful candidates of the LYS exam may enter traditional 4-year undergraduate degree (Lisans) programs. Students are placed in programs according to their scores on these two examinations.

There is currently much debate in Turkey regarding the general quality of Turkish primary and secondary schools to prepare students adequately for the university entrance examinations, with particular emphasis being placed on how students are forced into programs and institutions based solely on test scores. However, since the 167 Turkish universities presently have a total seating capacity of only 450,000 with over 1.6 million candidates each year (and rising due to national demographics), the current system is simply not arranged to include other student evaluation techniques such as personal interviews which are common in other countries such as the USA (Harvard University, 2012). However, there are changes being explored such as the use of Computerized Adaptive Testing (Kalender, 2012). As a result, Turkey has thousands of “cram schools” (dershanes) that prepare students solely for university and related examinations such as exist in Brazil (cursinhos), Japan (juku), and Korea (hagwon).

Some other core statistics regarding Turkish education include the following (Turkey Education: Statistical Profile, 2014):
• The average number of years of schooling adults: 5.3
• Duration of compulsory education: 12 years
• Educational spending as a percentage of Gross Domestic Product: 3.7%
• Expected duration of education for all students: 10.1 years
• Primary teacher salary starting: US$9,116 per year
• Teaching weeks per year (primary): 38
• Tertiary enrollment: 15%

3. USA Education System

It may surprise some readers the US Constitution does not mention education—nor does it mention an official language (Cornell University Law School, 2012). In fact, there is no national curriculum in the country, but states, school districts, and national associations suggest certain standards for school instruction (US Department of Education, 2012). Education in the USA has a pattern similar to that of many other nations. For example, early childhood education is followed by primary school (called elementary school in the United States), middle school, secondary school (called high school in the United States), and then postsecondary (tertiary) education. Postsecondary education includes non-degree programs that lead to certificates and diplomas plus six degree levels: associate, bachelor, first professional, master, advanced intermediate, and research doctorate. The American system does not offer a second or higher doctorate, but does offer post doctorate research programs. Adult and continuing education, plus special education, cut across all educational levels (US Department of Education, 2012).

Accreditation is the process used in US education to ensure that schools, postsecondary institutions, and other education providers meet, and maintain, minimum standards of quality and integrity regarding academics, administration, and related services. It is a voluntary process based on the principle of academic self-governance. Schools, postsecondary institutions and programs (faculties) within institutions participate in accreditation. The entities which conduct accreditation are associations comprised of institutions and academic specialists in specific subjects, who establish and enforce standards of membership and procedures for conducting the accreditation process (US Department of Education, 2012).

Both the federal and state governments recognize accreditation as the mechanism by which institutional and programmatic legitimacy are ensured. In international terms, accreditation by a recognized accrediting authority is accepted as the US equivalent of other countries' ministerial recognition of institutions belonging to national education systems.

The US Department of Education does not have the authority to accredit private or public elementary or secondary schools, and the Department does not recognize accrediting bodies for the accreditation of private or public elementary and secondary
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schools. However, the US Department of Education does recognize accrediting bodies for the accreditation of institutions of higher (postsecondary) education. If an accrediting body which is recognized by the Department for higher education also accredits elementary and secondary schools, the Department's recognition applies only to the agency's accreditation of postsecondary institutions (US Department of Education, 2012).

Some other core statistics regarding US education include the following (United States Education: Statistical Profile, 2014):

- The average number of years of schooling adults: 12
- Duration of compulsory education: 12 years
- Educational spending as a percentage of Gross Domestic Product: 5.7%
- Expected duration of education for all students: 16.7 years
- Primary teacher salary starting: US$25,707 per year
- Teaching weeks per year (primary):
- Tertiary enrollment: 72%

4. Global Talent Challenge: School Quality Implications

Despite the continued weak global economy as of 2013, there is still a growing global competition for talent. Due to the retirement of the so-called “baby-boomer” generation which developed after World War II (particularly in the USA) and a growing skills gap, critical talent is becoming increasingly scarce worldwide (Deloitte Development, LLC, 2010). For example, in 2000 the US Department of Education estimated that approximately 60% of all new jobs in the 21st century will require skills which only 20% of the US workforce will possess. This statistic evidently still stands (McKinsey Global Institute, 2012). Other related facts include (Deloitte Development, LLC, 2008; Australian Institute of Management, 2009):

- Australia: Over 51% of the 2,000 respondents to a recent Australian Institute of Management survey said middle-managers had the largest skills gap, followed by senior managers
- Canada: Approximately 44% of businesses report problems attracting qualified labor
- China: Fewer than 10% of job candidates are suitable to work in a foreign company
- Europe: By 2050, over 60% of the working age population will be people over 60 years old
- India: This huge country already experiences a shortfall of 500,000 professionals needed to fulfill available positions
- USA: American colleges will graduate only 198,000 students to replace 2 million “Baby-boomers” retiring between 1998 and 2018
These facts clearly indicate there are major issues regarding school / teaching quality worldwide. However, it must also be realized there are other circumstances surrounding the matter such as demographic changes and national cultural concerns. A nation’s economic health is based largely on the composition of its current and future workforce, which in turn impacts the major determinant of long-term national growth: productivity (Drucker, 2002).

5. Discussion

It must be noted these educational systems are not necessarily inherently superior to one another in aggregate, if only because each country faces very different challenges. For example, Turkey has a class size problem due largely to demographics (CIA Factbook, 2013), and the country’s educational policies are (relatively speaking) very often changed at the Ministerial-level. The USA needs simultaneously to upgrade student performance on international assessment tests and to curb serious teacher attrition. Other nations such as Azerbaijan and Kyrgyzstan also face critical education challenges today for different reasons (OECD, 2010). The fundamental challenges facing all educational systems include addressing cultural as well as structural issues. It is from this foundation that any meaningful, long-term changes to educational systems must be made, with the recognition there are no scientific standards for considering one group as intrinsically superior or inferior to another (cultural relativism) (Hofstede, 2001).

Innovation and imagination in university education are of particular importance today to increase the motivation and innovation of undergraduate students (Barnett, 2011; Özkul, 2012). There is also the issue of quality as mentioned above. The looming talent crisis in China is a good example to underscore the critical nature of these statements. For example, despite the vast supply of Chinese graduates each year (over three million), multinational firms operating in China continue to experience difficulty in finding and recruiting local candidates suitable for the advanced jobs available. Two of the major reasons for this occurrence are: 1) the Chinese university bias towards theory over practice; and 2) poor English language skills (McKinsey Global Institute, 2005).

The lesson to be learned in this particular example for all nations is two-fold: a) formal education must incorporate a healthy balance of theory and practice; and b) English language communication skills continue to be highly critical worldwide.

6. Conclusion

The American writer, Max Depree, once stated, “We cannot become what we wish by remaining the way we are”. Given the effects of today’s globalization, this statement holds particular value for the developed nations of the world, as well as for developing economies. The world is certainly a vastly different place from the one in which our parents and grandparents worked and lived, and technological advancement
is mainly responsible for the rapidity of changes in societies and economies worldwide (Christiansen, 2012). Therefore, creative solutions to future business and social challenges must become the norm rather than the exception, regardless of the economic system in place in a particular country. However, many educational institutions have not yet advanced creative thinking capabilities sufficiently (Şen, 2011). Raising the quality of graduates is a necessity because nearly all economies today must eventually evolve from manufacturing to services in order to mature on the global stage (McKinsey Global Institute, 2005). China, Turkey, and Vietnam are some examples of countries which are now nearing this next level in their economic development.

The author of this chapter is the product of the American, Chinese, and Japanese educational systems. That fundamental, first-hand experience, the facts presented in this chapter, and the author’s current and past academic and professional positions, lead the author to suggest the reader consider the following:

1) Practical Relevance & Focus

- Reforming education systems to the needs of the global job marketplace means teaching students how to apply their knowledge to real-world situations. Poland may be a solid model for the primary and secondary school systems because the country began revising its educational system in 1999 with the goal of improving the overall level of education in society. The country has captured a higher place than either Turkey or the USA on the Programme for International Assessment (PISA) test which is coordinated by the Paris-based Organisation for Economic Co-operation and Development (OECD) Program (OECD, 2010). PISA assesses how well students have obtained essential knowledge and skills required to participate fully within society. Reading, scientific literacy, and mathematical skills are covered not only with regards to the mastery of school curriculum, but also in terms of adult life skills.

- The USA can be considered a good model for university education, especially at the graduate and doctoral levels. American universities remain the top destination for international students, with top-ranked University of Southern California (USC) enrolling the most number of such students in the entire country (IIE, 2011a). It is worth noting that although there is a defacto national university entrance examination for American high school seniors (e.g., Scholastic Aptitude Test or American College Testing), other aspects of a candidate’s background are usually considered for admission such as extracurricular activities, overall scholastic Grade Point Average (GPA), special achievements, and personal interviews as found in Harvard University or USC (Harvard University, 2012; USC, 2012).
2) **Develop Creativity, Critical Thinking, and Curiosity**

- A core challenge in some education systems such as those found in Korea, Japan, and Turkey is that students are not given enough opportunity to develop themselves freely. In turn, this hinders creativity and critical thinking skills, and potentially overall student performance in international assessments such as PISA (OECD, 2010). All countries should review this issue regarding their respective educational systems and make any necessary corrections accordingly.

3) **Parental and Teacher Responsibility**

- Students are often blamed the most for their lack of achievement in school. However, more focus should be placed on fundamental issues such as parenting and teacher motivation for enhancing student success. Additionally, within this context parents and teachers alike shoulder the responsibility to make students understand both the pitfalls and strengths of their national cultural practices from a global context.

4) **Teacher Performance Reviews and Training**

- Many universities and other schools worldwide require annual teacher performance and development reviews. Such assessments conducted by universities such as the University of Glasgow in the United Kingdom can include: a) Performance against Objectives set the previous year; b) Research and Scholarship; c) Knowledge Exchange and Impact; d) Learning and Teaching; e) Esteem; and f) Leadership and Management. The educational systems of those nations which do not currently have similar programs in place should seriously consider their development and use.

5) **School Administration**

- There are far too many issues surrounding this aspect of education around the world to fit comfortably within the scope of this chapter. Therefore, the suggestion here is for administrators to review their current practices against a “Best Practices” list of the top schools in the world regarding administration. One solid example can be found on the website of NAFSA (www.nafsa.org), the world’s largest nonprofit, professional association dedicated to international education located in Washington, DC, USA.

6) **Culturally Responsive Teaching (CRT)**

- Defined as using the cultural knowledge, prior experiences, and performance styles of diverse students to make learning more effective for them, CRT acknowledges the cultural heritages of different ethnic groups (Gay, 2000). CRT is multidimensional, comprehensive, validating, and empowering (Gay, 2000)—it transcends Howard Gardner’s concept of “multiple intelligences”.

Culturally Responsive Differentiated Instruction (CRDI) as practiced in areas such as California and New York, USA (Metropolitan Center for Urban Education, 2008) is one possible solution to address the CRT challenge which exists in many school and university systems today.

7) **Special Note: English Language Training (ELT)**
- The author has spent a total of 10 years Teaching English as a Foreign Language (TEFL) in five countries at the high school, university, and adult learner levels, including in Turkey and the USA (in addition to teaching business and technology subjects at the university levels which included non-native English-speaking students). The author firmly advocates that ELT training in most non-English-speaking countries must be completely overhauled. Some critical specifics include: 1) more student- vs. teacher-centered instruction; 2) abandonment of the so-called “grammar or translation methods” in favor of the communicative method based on listening and speaking supported by reading and writing; 3) more positive vs. negative reinforcement in teaching; 4) development of a standardized ELT curriculum with less focus on testing and much more stress on actual skill performance, especially speaking. This aspect of education is highlighted here because English remains the world’s main language for communication worldwide (refer to the China example above). Notably, strong English skills are also required for admissions acceptance in English-speaking countries with top universities such as Canada, the UK, and the USA, or in student and teacher exchange efforts such as the European-based Erasmus Program. And, at least one commonly used foreign language is needed to follow technological and scientific developments around the world (Şen, 2012). English remains that common language.

Clearly, a new age in education is upon us—one which demands culturally-sensitive teachers who are not only aware of the different challenges and needs presented by foreign students in the global classroom, but also teachers who can practice differentiated instruction for students with different learning styles (e.g., visual, auditory, tactile). Creating multiple paths so students of different abilities or needs experience equally appropriate ways to learn effectively are a critical component of the 21st century global classroom.

This must all be connected with relevance regarding the needs of work in contemporary globalism. Regarding this matter, it is meaningful to raise the issue of online learning in the classroom and in the corporate environment for continuous learning. The global online education industry is currently a US$74 billion market that is expected to increase to US$220 billion by 2017 (MarketsandMarkets, 2012). Therefore, the acceptance of online training should rise accordingly, although in some countries
this may be delayed due to cultural and legal traditions. Nonetheless, online learning is a highly valuable tool to develop the knowledge base of students and employees alike, particularly of the older “Knowledge Worker” who will form a critical part of advanced economies in the 21st century (Drucker, 2002).

In closing, it is important to mention the issue of Diversity Education. As mentioned early in this chapter, the general nature of jobs is changing quickly in a highly interconnected world, a fact which requires future employees and managers to have a solid appreciation and awareness of different cultures, languages, and nationalities. This matter does invoke the need for motivational cultural intelligence (Christiansen & Sezerel, 2013). Before being cast into the working world regardless of industry or profession, secondary and tertiary students around the world should be provided with at least some exposure to Diversity Education courses before graduation. Diversity Education has the long-term goal of helping people to work effectively in increasingly diverse organizations (Bendick, Egan, & Lofhjelm, 2001, as seen in Kulik & Roberson, 2008).

Since many organizations today have foreign ownership or employees from different countries as can easily be witnessed in any major international city such as Istanbul, New York, Riyadh, or Jerusalem, the need to better develop diversity competence—as well as the other competencies mentioned in this chapter—in students at the undergraduate-level and below only continues to rise (McKinsey Global Institute, 2012). Prosperity and peace today depends on increasing the capacity of people to think and work on a global and intercultural basis. As technology opens borders, educational and professional exchange opens minds (IIEb, 2012).

7. References


Summary

Globalization of the 21st century has changed economic and other realities far beyond the expectations of most individuals; the worldwide financial meltdown of 2008 serves as a particularly pervasive example. Experts in business, education, finance, government, and other fields are still working to revise various systems and infrastructures that will operate in a robust manner within the new realities of today. This chapter focuses on the educational aspect of that massive effort by briefly comparing two countries with very different cultural, economic, and geopolitical situations: Turkey and the USA. These two nations can serve as model examples for other countries with similar backgrounds from which a general analysis can be derived for future discussion on educational issues. The chapter commences with an introduction to the realities of contemporary globalism that underscore the very purpose for this chapter, and the body then outlines in some detail the current systems in the two countries. There is also discussion about the need for culturally responsive teaching (CRT) in the “global classroom” that exists today. The conclusion synthesizes the earlier discussions and provides suggestions to create a paradigm shift in thinking required for most educational structures. The author forwards that many papers on education do not sufficiently cover the practical application of and reasons for educational reforms today. Therefore, it is believed this effort shall assist in rectifying the situation.
1. Introduction

Entrepreneurship is an important research topic, mainly due to its theoretical complexity and practical significance (Glinka, Gudkowa 2011). Representatives of many scientific disciplines: economics, management science, psychology, sociology or law, attempt to explain or describe the concepts of entrepreneur and entrepreneurship (Casson 2010; Shane 2003; Piasecki 1998; Glinka 2008; Matusiak 2006). Due to the interdisciplinary nature of the two terms, so far the researchers have not managed to formulate a universal and unambiguous definition of any of them — what is more, many aspects of entrepreneurial activity remain unrevealed.

Teaching entrepreneurship also remains a challenge. In Poland, entrepreneurship is a mandatory subject in the curriculum of lower and upper secondary school education, whereas at the level of tertiary education teaching entrepreneurship is not universal (Richert-Każmierska 2011, p. 38-41). Although the universities are expected to develop academic entrepreneurship (2005. Ustawa, art. 4), the question what and how to teach students within the framework of broadly understood entrepreneurship remains
open. Shall we focus more on teaching the entrepreneurial way of thinking and entrepreneurial activity (entrepreneurial attitudes and behaviours), or rather on setting up and running a company (a traditional approach relating entrepreneurship to the small business sector) or on operating in an environment of high technology and modern organisational solutions (an approach oriented towards the promotion of the initiators of innovative projects)?

The purpose of the chapter is an overview of the available methods and techniques of teaching entrepreneurship at the academic level, as well as the presentation of the methodology of the work with students within the framework of the Entrepreneurship course at the Faculty of Management and Economics of the Gdańsk University of Technology.

2. Teaching of entrepreneurship at the academic level

Both in the United States of America and in Europe an increased activity of politicians, academia and business representatives aimed at including entrepreneurial training programmes in the college and university curricula could be observed in the recent years.

In the United States the process of introducing entrepreneurial training at colleges and universities started in the seventies of the 20th century. It is estimated that currently more than 80% of all U.S. colleges and universities implement such programmes. According to the report of U.S. Department of Commerce, “American universities are focused on the pedagogical value of entrepreneurship as a set of skills that can be applied across professional environments and activities to supplement the students’ classroom experience. Universities are investing both in formal programs as well as in extra-curricular activities to channel students’ interest in solving global problems through entrepreneurship” (2013. The Innovative and Entrepreneurial University).

Table 1. Programmes supporting entrepreneurial behaviour among students of selected U.S. universities

| The University of Colorado System’s Innovation and Entrepreneur Degree | Offers a Bachelor’s degree in Innovation (B.I.), through a unique multi-disciplinary team and course work approach. |
| The University of Illinois’ Patent Clinic | Provides law students the opportunity to draft patent applications for student inventors. |
| Washington University in St. Louis’ student internship program | Offers 25 paid internships per summer for students to work in start-ups. |
| Rice University | Raised and provided $1.2 million in cash and in-kind services for its business plan contest in 2011. This money has served as a de-facto angel round of funding for the recipient companies. |
| University of Washington | Hosts a multi-level business plan competition comprising of different competitions throughout the school year, in combination with seminars, courses and mentorship to assist in pushing student ideas to the next level. |
| University of Florida | “INSPIReation” Hall – Is the nation’s first entrepreneurship-based academic residential community — encouraging student interaction with fellow students, leading researchers, distinguished faculty, business professionals, and entrepreneurs. |

Source: (2013. The Innovative and Entrepreneurial University, p. 9).
In turn, the responsibility for the promotion and implementation of entrepreneurship education at university level in the European Union was entrusted to the Directorate-General Enterprise and Industry. Guidelines defining the scope, methodology and institutional engagement in this process include the following documents:

- Implementing the Community Lisbon Programme: Fostering entrepreneurial mindsets through education and learning (COM/2006/0033);
- The Oslo Agenda for Entrepreneurship Education in Europe (*The Oslo Agenda*);
- Entrepreneurship in higher education, especially in non-business studies (2008. *Entrepreneurship in higher education*).

Promoting entrepreneurship at Polish universities is enforced by statutory provisions introduced within the framework of the reform of tertiary education in 2005 (2005. *Ustawa*) and 2011 (2011. *Ustawa*). The universities have been obliged, among others, to cooperate with entities acting in their environment more closely, educate in accordance with the socio-economic needs, promote entrepreneurial attitudes in academia, support the process of creating *spin-off* businesses, include business practitioners in the teaching process, as well as monitor the careers of graduates. On the national level several initiatives aimed at supporting entrepreneurship in the academic environment, although not involving the activities related to education and teaching, are implemented. These include:

- *Top 500 Innovators*, a programme offering training for young researchers at leading overseas universities to encourage the development of knowledge transfer and the commercialization of scientific research;
- *Brokerzy Innowacji*, a project supporting managers of innovation at Polish universities;
- *Inkubatory Innowacyjności*, a project aimed at creating a nationwide network of incubators of innovation enabling researchers to commercialize innovative solutions;
- *LIDER* and *Kreator Innowacyjności* – programmes aimed at stimulating the commercialization of scientific knowledge among the public scientific institutions, as well as at building relationships between research and development institutions and business.

The reality of the Polish universities demonstrates that entrepreneurship courses are still not offered by all universities or at all majors. Their availability is confirmed mainly by the students of business majors, whereas they is by far sparser at majors related to technology, science and art. In 2008, as many as 60 percent of the more than five thousands of final-year students of Pomeranian universities stated that they did not attend any entrepreneurship course during their studies, although in 2010 there were fewer negative responses (42%) (2010. *Studenci ostatniego roku*). Research results from 2013 show a slight improvement of the situation in respect of the teaching entre-
entrepreneurship (although still not many universities offer such a programme for the majority of students) and using more diverse forms of promotion of entrepreneurial behaviour in the environment (see fig. 1, fig. 2).

![Fig. 1. The goals of universities related to entrepreneurship (N=22)](image)

Source: (2013. Umiejętności i kompetencje w zakresie przedsiębiorczości.).

![Fig. 2. Percentage of students participating in entrepreneurship courses](image)

Source: (2013. Umiejętności i kompetencje w zakresie przedsiębiorczości).

Polish universities have not adopted a single, common approach to teaching of entrepreneurship. The discussion is still open as to:

- who should be taught entrepreneurship (which students, at what majors and types of study);
- how to teach entrepreneurship (within the framework of a separate course with the word entrepreneurship in its name, or within the framework of an entire block of courses covering i.a. classes in management, marketing or decision making, by means of a compulsory student traineeships etc.);
- what methods and forms of teaching should be used to teach entrepreneurship (lecture, seminar, workshops, visits to companies etc.);
what should be the purpose and substantive scope of the entrepreneurship classes (should we focus more on building awareness of the entrepreneurial and creative thinking, developing skills to create new solutions, or rather discussing and practising the procedures associated with establishing and running one's own company?).

This means that each university and its scholars involved in the teaching of entrepreneurship make the respective choices on an individual basis (although subject to procedures taking into account of the decisions of the faculty/university curriculum board, national qualifications frameworks, guidelines etc.).

The most commonly used methods of working with students within the framework of entrepreneurship classes in the colleges and universities surveyed by the OECD in 2013 included (see Figure 3):

- working on the business plan of one's own venture;
- creating new ideas; as well as
- meetings with business practitioners.

Meanwhile, students perceived the internships in companies, as well as the traditional classes as the most inspiring to set up one's own business (see Figure 4).

---

Fig. 3. Teaching methods used at Polish universities within the framework of the entrepreneurship course (N=76)

Source: (2013. Umiejętności i kompetencje w zakresie przedsiębiorczości).
Regardless of the final choice of the substantive scope and methodology of the work students during the entrepreneurship classes, it is important to provide them with:

- the development of their passions and interests, including entrepreneurial skills, self-esteem, self-motivation and exploring new areas of interest;
- access to knowledge and tools related to setting up and running companies, including the practice of cooperation and interaction, negotiation, as well as using the methods and tools of management;
- opportunity to enhance other skills within the area of entrepreneurship, necessary for identification and practical use of business opportunities.

3. Entrepreneurship at the Faculty of Management and Economics of the Gdańsk University of Technology – selected methods of work with students

At the Faculty of Management and Economics of Gdańsk University of Technology Entrepreneurship is included in the curriculum as a compulsory course in the last semester of the full-time and part-time postgraduate Master's programme in Management. According to the current curriculum, the subject includes 15 hours of lectures and 30 hours of exercise classes worth 3 ECTS points (Katalog 2014). The content of education corresponds to the guidelines contained in the "Standards of education for the Management major" (Standardy 2014) for the subject Entrepreneurship, although it is not limited to the points indicated in the document.
In view of the fact that as of the academic year 2011/2012* the classes in *Entrepreneurship* are attended by students who for the most part already participate in the labour market (as workers, the self-employed or entrepreneurs)*, it was decided that the primary objective of the course is the development of entrepreneurial skills, including entrepreneurial thinking and solving problems, working in teams, as well as designing and implementing innovative projects.

Achievement of so defined objective required modification of existing methods and forms of teaching. As far as the lecture part is concerned, a conventional lecture is replaced by a conversational one. In addition, at least two of the 15 lectures are conducted by invited guest practitioners. The speakers who have so far met with students during the lecture classes of *Entrepreneurship* included the counselors from the Provincial Labour Office in Gdańsk, representatives of the Pomeranian Science and Technology Park, as well as entrepreneurs representing local business. In the practice part the activating forms were introduced, shaping the students’ teamwork skills, as well as their capability of entrepreneurial thinking and action. A set of working methods used during the *Entrepreneurship* classes was shown in Figure 5.

---

* Before changing the curriculum of Management studies in 2011, the classes were conducted during the fifth semester of the graduate studies.

* This applies to both full-time and part-time students.
One of the problem tasks that arouses most excitement among students is the explanation of the phenomenon of entrepreneurship using the parallel of a tree. The task description is presented in table 2.

### Table 2. Proposed organization of classes consisting of explaining the phenomenon of entrepreneurship through the parallel of a tree

<table>
<thead>
<tr>
<th>Size of the group working on the task</th>
<th>exercise group split into subgroups of no more than 4 individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to work on the task</td>
<td>20 minutes – discussion on issues of entrepreneurship (using the knowledge gained during the previous classes and while studying the literature)</td>
</tr>
<tr>
<td></td>
<td>10 minutes – introduction to the task</td>
</tr>
<tr>
<td></td>
<td>40 minutes – group work</td>
</tr>
<tr>
<td></td>
<td>20 minutes – presentation of the results of the work of each group</td>
</tr>
<tr>
<td>The necessary materials</td>
<td>A1 size paper sheet for each group</td>
</tr>
<tr>
<td></td>
<td>coloured markers</td>
</tr>
<tr>
<td></td>
<td>adhesive tape</td>
</tr>
</tbody>
</table>

**Fig. 5. The methods used during the Entrepreneurship course at Faculty of Management and Economics of Gdańsk University of Technology**

Source: own work

One of the problem tasks that arouses most excitement among students is the explanation of the phenomenon of entrepreneurship using the parallel of a tree. The task description is presented in table 2.
"The roots of the tree" denote the determinants of development of entrepreneurship, as well as attitudes and entrepreneurial behaviour (on an individual scale and in relation to a wider group). Here students usually indicate such groups of factors as:

- individual personality traits,
- culture and education in the sphere of values associated with entrepreneurship,
- education system,
- economic system,
- legal-administrative and economic conditions.

The "watering can" symbolizes solutions supporting entrepreneurship, particularly among the SME sector companies. Among the known and desired by entrepreneurs, students cite, i.a., such solutions as:

- solutions of a financial nature: grants, funding within the framework of EU projects, loan funds, loan guarantee funds or access to low-interest loans and credits,
- support of a substantive nature: access to training, consulting, the offer of incubators and science and technology parks,
Methodology of entrepreneurship teaching in tertiary education – experiences of the Faculty of Economics ...

- administrative rules and law involving the simplification of procedures associated with setting up enterprises, as well as ensuring transparency of entrepreneurial activity.

The effects of entrepreneurial activities and entrepreneurship as a socio-economic phenomenon are shown in the figure as the "fruit". In their discussions, the students pay attention to, i.a., the results in the form of:
- increase of the society's wealth,
- improvement of the situation in the labour market associated with employment growth,
- development of the innovativeness of companies and their growth,
- market development,
- acceleration of entrepreneurship.

A key element of the practice class is the implementation of a group project. With the introduction of Entrepreneurship in the curriculum of the postgraduate Master's studies, it was decided to abandon the student work on the project of one's own business venture. The main reason was the avoidance of repetition. The project class involving the preparation of a business plan and marketing plan for selected enterprises is a component of other courses in the curriculum of the graduate and postgraduate studies in Management.

The group project consists of the implementation (using the methodology of project management and teamwork) of a real project or product. In the course of the project, students may i.a.:
- demonstrate their ability to work in groups, plan, organize or manage projects,
- use their skills and contacts to establish relationships with the business environment,
- acquire problem-solving skills, as well as the ability to act in accordance with the procedures being in force in a given organization,
- present the theoretical knowledge and practical skills acquired during the Entrepreneurship course.

The group working on the project (depending on the semester, 23 to 30 individuals) selects the subject of the task and a formula for its implementation. It then clarifies in detail the substantive scope, builds organizational structure (division into task forces, including the selection of the management group coordinating all the other groups, the choice of the leaders of task groups, task allocation along with a description of responsibility for individual actions), as well as draws up a schedule. The project takes the last 5 weeks of the respective semester. The topics of the project tasks selected so far by the students include:
- "Entrepreneurship is a woman",
- "Entrepreneurship can be learnt",
- "Generation Y entrepreneurship", or
"Allies of an entrepreneur".

On the other hand, the successful outcomes of the project work include:

- development of an interactive *Young entrepreneur's guide*,
- creation of a web portal related to female entrepreneurship *Przedsiębiorczość jest kobietą, czyli biznes pisany szminką*, http://www.przedsiębiorczoscjekobieta.cba.pl
- creation of a portal dedicated to the institutions of business environment in the pomorskie province *Sprzymierzeńcy.pl – sprzymierz swój biznes*, http://www.sprzymierzenia.pl
- organization of the faculty-wide conference under the theme *Do dzieła- nie umartwiaj się tylko podejmij wyzwanie (Heads up! Don't worry! Take the challenge)*,
- organization of the faculty-wide conference under the theme *Pokolenie Y jest przedsiębiorcze (Generation Y is entrepreneurial)*,
- development of an open e-learning course on the Moodle platform titled *Przedsiębiorczość prosta rzecz (Entrepreneurship? A simple thing!)*.

Table 3. Detailed description of selected projects completed within the *Entrepreneurship* course

<table>
<thead>
<tr>
<th>Design</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| A web portal related to female entrepreneurship *Przedsiębiorczość jest kobietą, czyli biznes pisany szminką* http://www.przedsiębiorczoscjekobieta.cba.pl | — scientific publications devoted to female entrepreneurship  
— the results of a survey conducted by students to investigate the possibilities and conditions of female entrepreneurship  
— student films showing silhouettes of women entrepreneurs  
— student films presenting men's opinions on women's entrepreneurship |
| A portal dedicated to the institutions of business environment in the pomorskie province *Sprzymierzeńcy.pl – sprzymierz swój biznes* http://www.sprzymierzenia.pl | — characteristics of selected institutions of business environment in the pomorskie province (e.g. business incubators, science and technology parks, loan funds, business angel networks etc.)  
— description of the forms of assistance that may be obtained in selected institutions of business environment and any limitations resulting from starting cooperation with such organizations by a company  
— summary of the address data of business environment institutions operating in the pomorskie province |
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According to the students, the implementation of the above-described project formula within the Entrepreneurship course is for (a majority of) them a completely new experience. It has good and bad sides, however. The benefits of this form of the course mentioned by the students include:

- the opportunity to acquire new skills,
- acquiring experience related i.a. to developing contacts, acting according to certain procedures or the organization of projects,
- experiencing real problems,
- the possibility to make decisions and experience their consequences,
- sense of responsibility for the final outcome of the task,
- practice of teamwork.

Difficulties that students pay attention to in connection with work on the project include:

- the need for cooperation of all members of the group (usually students work in small groups, with persons they know well), the interdependence of the various elements of the task at hand, the dependence of the final result on the involvement of each student in the group in the work and the efficient coordination of actions of many persons,
- greater amount of work and flexible time for the execution of the task — the activity of students is not limited to 90 minutes per week (as is the case with the traditional organization of classes) and requires an intense commitment during the whole period of five weeks when the project is implemented (90 minute classes in classroom, resulting from the schedule, are meetings aimed at planning actions and determining their details, as well as reporting the already completed tasks),

Source: own work.
• responsibility for a specific part of the task before the other members of the group,
• public nature of work results,
• often quite painful confrontation of theoretical knowledge with practice.

The presented formula of the *Entrepreneurship* course was discussed at the meetings of employees of the Department of Business and Economic Law at the Faculty of Management and Economics of the Gdańsk University of Technology, as well at the meetings of the Faculty Curriculum Committee. Although it differs from the traditional approach in which the emphasis is placed on issues related to starting a new business (Cieślik 2014), it was decided that it will be continue in subsequent semesters. In fact, activating and engaging forms of classes organization result in students' acquiring new skills and competencies, which in turn means that they become better prepared to entering the labour market. Among the skills particularly important in the context of future of the graduates in the labour market and shaped during the *Entrepreneurship* course (in the way described above), the following ones should be distinguished:

- developing creative ideas,
- planning tasks and organizing the process of their execution,
- decision making,
- project management,
- teamwork,
- networking with stakeholders in the university environment.

4. Conclusions

With the reform of the Polish tertiary education implemented in recent years, the curricular autonomy of universities has increased. The rigid, central standards of education are eliminated and universities are gaining the freedom to create new, non-standard majors. Programs are created with the support of scientific authorities, employers and experts in the field of economy. This also translates into benefits in the form of a more flexible methodology and formulas of classes, also within the scope of the broadly-understood entrepreneurship.

Despite the lack of consensus on many issues related to the teaching of entrepreneurship, the evaluation of several of them is commonly accepted. First of all, it concerns the belief that due to the nature of the phenomenon of entrepreneurship teaching should avail of new, activating methods of work with students. Traditional methods do not contribute sufficiently to the development of entrepreneurial characteristics and behaviours that are the desired effect of education. The methods that prove particularly useful in the teaching of entrepreneurship include: (Richert-Każmierska 2011, p. 38-41)

- educational games (functional, decision-making, simulation-based, planning-based),
projects, particularly for solving specific problems,
conceptual maps,
educational discussions.

The authors of the Entrepreneurship course implemented at the Faculty of Management and Economics of the Gdańsk University of Technology decided to use just those activating methods that involve new ways of working with students. Experience in working with them is satisfactory both in the opinion of students (as reflected, i.a., by a high rate of attendance, high activity in the classroom, the quality of project preparation and the comments contained in the periodic evaluation of teachers made by the students at the end of each semester) and in the perception of the teacher.

5. References
Summary

The purpose of the chapter is an overview of the available methods and techniques of teaching entrepreneurship at the academic level, as well as the presentation of the methodology of the work with students within the framework of the Entrepreneurship course at the Faculty of Management and Economics of the Gdańsk University of Technology. Author of the chapter is also the author of the Entrepreneurship course implemented at the Faculty of Management and Economics of the Gdańsk University of Technology. She decided to use just those activating methods that involve new ways of working with students. Experience in working with them is satisfactory both in the opinion of students (as reflected, i.a., by a high rate of attendance, high activity in the classroom, the quality of project preparation and the comments contained in the periodic evaluation of teachers made by the students at the end of each semester) and in the perception of the teacher.
CHAPTER 3

The role of case studies and management experience in the education and personal development of IT project managers

Artur ZIÓŁKOWSKI *, Kamil ZIÓŁKOWSKI**

1. Introduction

Project management experiences have an increasingly important role in the management of IT projects. Each project is unique by definition, which means that it can be risky and requires making certain management decisions in order to achieve the ultimate success (Philips, 2007). This success in most cases is measured by performing high quality product in full range with keeping deadlines. The uniqueness of the project means for managers that they do not have an exact reference point while making current decisions. This raises the question: what is the kind of knowledge, which helps to make a good decision?

Most popular project management methodologies and the collection of good practices (such as PMBoK, PRINCE2 or RUP) explicitly and formally apply to the management of knowledge and experience design (Bergstom, Rebel, 2003; Kruchten, 2004). Developers methodologies pay special attention to the need for project management experience. In these methodologies there can be found series of good practices related to the management experience to the needs of current and future projects. Project managers receive guidance showing how important are project experiences and include tips helping to manage these experiences to make better project decisions.

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So that, managing knowledge and project experiences should enable making project decisions. In addition, it also has an educational role, because it provides a reference point, while next projects are realizing. Because the project is unique and unrepeatable, predicting all its aspects is impossible (Schwalbe, 2010). But the study historical experience from other projects may help to prevent some errors. Thus, basing on the experience allows to reducing of project risk (Parth, Snyder, 2007).

Project experiences can also be a starting point for training project managers. Therefore, the subject of management knowledge and experience in projects is worth to be related to training of project managers. It is adopted in the education of managers that example case studies, which include simplified project situations, are the starting point. In this chapter there is presented the proposal to extend such training for a new approach based on quantitative data collected during the project implementation. This approach, which is based on case studies and also on experiences gained during the implementations of specific projects, is somewhat broader approach bringing out the context of project management.

Therefore, the aim of this chapter is to present the concept concerning education of project managers on the basis of experience from real projects and using of recording decisions taken in these projects. In the first part of the chapter there is shown the impact of experience on the development of project management skills, and there is also pointed the need for historical data about the projects in order to make better project decisions. In the following, there is highlighted the importance of case studies for the purpose of improving managerial skills. chapter is finished by the presentation concerning concept of using records of project experiences, which are built-in in tools, which are used to managing projects.

2. Managing knowledge and experience in IT projects

Knowledge management process described by Probst is a universal process that works in both the projects as well as any other (Probst, Raub, Romhardt, 2002). This process is inherently runs in four main stages: locating, collecting, developing and sharing knowledge.

Locating knowledge in the case of a project manager is to extract these sources, which can be helpful in making project decisions. These sources can be either related to the documentation of previous projects stored in repositories, and may also involve hidden knowledge held by the participants of the project. The project manager should be aware of potential sources of knowledge needed to manage the project.

Accumulation of knowledge is a process associated with formal ordering of previously localized knowledge. The role of the manager is to reject this knowledge, which is less important, and gather this one, that which is necessary for the project. The accumulation can be non-structured (some project management support systems have
dedicated repositories) and may have a less formal character - as the current log of the project (as in PRINCE2)

**Developing knowledge** is a process that allows to process previously accumulated knowledge. The project manager is responsible for making decisions because these decisions should be supported by properly processed knowledge. Developing knowledge may be held by using analytical tools (such as spreadsheets or business intelligence)

**Sharing knowledge** is a key process linked to cooperation with other project participants and stakeholders of its results. Therefore, the role of the manager is to provide appropriate mechanisms for sharing knowledge: both the one that has been accumulated for the project and the one that is worked out in the course of his lifetime.

It is easy to notice that in every project these four essential aspects will be reported to project manager. They can, of course, to varying degrees, affect the various elements of the environment of the project, which should include a supplier and client or user, but also experts, stakeholders, technology or legal and social conditions.

It can be said that the knowledge management process runs differently in the case of a knowledge management project team and otherwise in the case of the client. This does not change the fact that these processes will taking place in relation to each element of the project environment. Table 1 shows examples of knowledge management in the client and productive team area, which most concern the project manager and on which he has the greatest impact.

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Fig. 1 Environment of project

---

Table 1 Examples of Knowledge Management

<table>
<thead>
<tr>
<th>Client</th>
<th>Productive Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experts</td>
<td>Tools</td>
</tr>
<tr>
<td>Good Practices</td>
<td>Rules</td>
</tr>
</tbody>
</table>

39
### Table 1. Relation between IT project management and the classic process of knowledge management

<table>
<thead>
<tr>
<th>Locating knowledge</th>
<th>Project team</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project manager should know the potential of his team - set of powers, which it disposes. He should also know experiences, which has a project team and projects realized by project team and kind of tasks, which project team do best.</td>
<td>The project manager should locate the appropriate source of information on the client side to be able to provide adequate information on the final product of the project. The project manager should know who - from the client side - will provide knowledge about the needed functionalities and expectations. (Wiegers 2003)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accumulation knowledge</th>
<th>Project team</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project manager should be able to confront the knowledge of his team with the scope of the project. Without a formal assemble of this knowledge it can be hard to grasp the &quot;bottlenecks&quot; or track down any problems, so it can be a reason of problems in the implementation of project tasks.</td>
<td>The project manager should provide mechanisms to accumulate the customer's expectations connected with creating a solution. In most cases the analysts in the project are responsible for this process, but the project manager exercises formal supervision. Accumulation of knowledge from the client can take place using dedicated tools for writing down the requirements, but it can also have a reporting character.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Developing knowledge</th>
<th>Project team</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the realization of the project, the team acquires new experiences. The project manager should provide mechanisms conducive to the development team's prior knowledge and provide ways to identify new knowledge acquired by the team during realization of the project.</td>
<td>The project manager should make sure that the accumulated knowledge subjects to constant revision. Any change in customer expectations should be recorded on time. It is also well to draw conclusions from any changes in order to protect themselves in case of variance in the next stages of the project.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sharing knowledge</th>
<th>Project team</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>This area of knowledge management proceeds bidirectionally. Firstly, the project manager is the link between the business side and the production, so he must be able to share the acquired knowledge with the team from the business side (i.e., from business to the team). He must also provide knowledge about the business side of the project, respectively communicating any problems (that is, from the team to business)</td>
<td>The project manager is responsible for the communication with the client and his representatives, so that he should provide adequate mechanisms for knowledge sharing. Most commonly this is done in the form of regular meetings, but can also be in the form of reporting or transparent producing by communicating everything on-line.</td>
<td></td>
</tr>
</tbody>
</table>

Source: own work
The experiences of the authors show that most of the problems in today's work of project managers provide LOCATE and ACCUMULATION OF KNOWLEDGE processes. Although the process of SHARING KNOWLEDGE, especially in case of contact with the customer can be crucial for the project. Hence, it was decided to look at the issue of knowledge management and design experience from the perspective of two classic approaches to project management - PMBoK and PRINCE2. Methodologies were selected not only because of their great popularity, but mainly due to the fact that they are management connected approaches, so they are adapted to any project, without going into the technical details (or productive). Of course, knowledge management processes and experiences are also highlighted in the purely productive approaches (like SCRUM), however, they have not so clearly formalized approach as the two mentioned.

3. Knowledge Management by PMBoK

PMBoK (Project Management Body of Knowledge) is a collection of good practices of project management, not just IT (PMI, 2008). However, recent years have shown that the approach PMBoK project management has become very popular just in the IT industry.

PMBoK as a methodology treats the project as a set of activities involving knowledge, skills, tools and techniques to achieve the objectives of the project stakeholders. Thus clear that the knowledge of project management is one of the key elements contributing to the success of the project.

On the other hand, the same recommendations of PMBoK are aggregated within the so-called. areas of knowledge. Each of these areas is amenable to the project manager and should be constantly monitored. There are included i.e. project integration management, scope management, time, cost, quality, human or risk to these main areas of PMBOK.

In each of these areas there can be seen a typical knowledge management processes associated with the identification of sources of knowledge and providing knowledge processing mechanisms of the area, which use tools and techniques.

In fact, PMBoK does not define experience management as one of the key areas, but aspects of management knowledge and experience are evident in all areas, which includes the PMBoK.

4. Management experience by PRINCE2

PRINCE2 is a methodology of a similar nature to PMBoK and it contains good management practices related to the management of projects (PRINCE2, 2009). PRINCE2 is one of the managerial methodologies that can be used for all types of projects. However, as PMBoK, it is now widely used in IT projects. PRINCE2 to its main,
basic principles, overarching rules includes - among others - experience management pointing to the need to consider these experiences in managing new projects.

A principle of USING THE EXPERIENCE recommends to project teams references of actual knowledge to knowledge from previous projects. The project manager should search for, save and use the experience during the project cycle.

Learning processes based on experience by PRINCE2 run in all stages of project management, i.e. from preparation to launch the project through implementation stages and ending on the closing process.

PRINCE2 recommends at the beginning of the project to review the previous similar projects in order to see whether the previously accumulated experience can be used in the current project. During the project, the own experience should be included in all reports and surveys. The purpose of such action is to seek improvements to the current implementation. During the closing the project experience should be codified, recorded and stored for future projects. In addition, it should be emphasized that the PRINCE2 recommends the use of a log of experience as a collection of all the knowledge used during the project.

This review was aimed to show that aspects of knowledge and experience management are present in IT projects at every step. These processes apply to both work with all project stakeholders, as well as between the manager and the team. On the other hand the recommendations contained in project management methodologies also formally relate to the management experience and knowledge. So there are two questions: can you learn how to use the experience? Can project managers educations draw attention to aspects of the use of the experience?

There is no doubt that the management experience and knowledge is a very important area for each project. However, if the powers of managers can be developed precisely in this area? Typical managers training can rely on the experiences of other projects through the analysis of case studies. However, it should be stressed that experiences included in typical case studies often are connected with a row of simplifications. Hence, managers training allowing to strengthen their competence in the use of the experience and knowledge management based on typical case studies are not fully effective. The rest of the chapter proposes the use of project management tools and a dedicated module containing a record of experience that can assist project managers in learning based on experience.

5. Learning based on experience

Earlier analysis aimed to indicate how important for project management is the skillful use of knowledge and experience. It should be noted that from the point of view of the manager of the project knowledge and experience management is a two-way action.
The figure above shows a situation, where the project manager uses the experience of previous projects. However, at the same time, during the project he generates new knowledge and documents new experiences. The management of these experiences must therefore take place both before the start of the project as well as during his lifetime and, finally, should be reviewed after the completion of the project to be used in future projects.

This approach is very important from the point of view of project managers' education. It turns out that simply pointing to the necessity of knowledge management is insufficient. Much more effective is to allow project managers to learn project management using experiences. Previously, in this chapter, there was indicated on the classic source of learning based on experience which is the analysis of case studies in the field of project management. However, the purpose of this chapter is to point to other learning opportunities based on experience. Hence, below part of chapter is focused on classical learning using case study. Then there is shown complementary approach with use of tools used in project management.

6. **Classic approach to learning by case study**

Classic educating the managers in the use of the experience consists of providing the managers finished case study describing specific project situation. Analysis of the education market (both at the university level and at the level of accredited training centers) allows to detect that case studies used in the training of project managers includes simplified situations.

Simplification that can be observed in these case studies relate, for example limited to one project management methodology, lack of information about the level of maturity of the project team and client maturity, lack of information about the level of risk or other key elements of the environment of the project (listed in Figure 1).
Typical case studies used in the education of project managers is constructed of such parts as the introduction to the topic, information about the company, the basic parameters of the project (time, budget, scope). In the remainder of this case study there are problematic issues which are the main element. The process of learning is based on problematic issues. In many cases, these case studies also include suggestions for solutions that would achieve the organization realizing the project.

A typical case study includes didactic aspect, of course, and allows to see what problems are met by the managers of other projects. However, there is one doubt - is that learning sufficiently effective? While in the cognitive dimension typical case studies are fulfilling their role, in its development (creating new) knowledge dimension, they are not the most effective. It is true that the trainees can find their own solutions, however, they are not able to predict the end of the impact of these solutions. This is due to the fact that the classical case studies are fairly static.

In the classical case studies very often there is verified acquire knowledge through a series of competence questions, which are placed at the end. However, these questions allow rather to confirm and verify assimilate the knowledge contained in the case study, however, do not check the readiness to make appropriate use of the acquired knowledge. To verify the acquired knowledge in the course of studying the case it seems necessary to give case studies a bit more dynamic character.

This dynamics can be achieved through a variety of solutions verifying the acquired knowledge (e-tests) and allowing for forecasting / predicting how decisions will alter the project. Then the acquired knowledge can be tested in simulation environment. But even here there are problems - how complex knowledge base should have a "case" to having efficiency of learning? Therefore, in the next section there is presented a proposal for the creation of case studies based on project experiences stored in repositories.

7. Learning based on project experiences

This section is devoted to the fragment of research conducted as a part of the IBM Center for Advanced Studies at Gdańsk University of Technology.

It turns out that today's IT project management is not detached from the tool. Research carried out by one of the authors showed that regardless of the methodology (PMBOK, PRINCE2 or even SCRUM) project managers use tools to monitor and control the status of the project(Schwalbe, 2002, 2011). Thus, organizations are purchasing all kinds of products which support project management. These tools can be applications that allow to manage current tasks and team, but can also provide developed management support systems to whole project portfolios.
The design of these tools is based mostly on the repository project, where various design decisions are recorded. An example of such a tool is the IBM Rational Team Concert, where all decisions made during the project are stored in the repository - external database. Due to the records that is possible to recreate the course of the project and all decisions taken by the project manager.

Due to the popularity of various types of tools in project management, in IBM software development projects for project management, there were taken decisions on the IBM CAS PG to expand RTC tools on module that allows to analyze project data in the repository RTC.

This solution in addition to assist project managers is also very important to teaching. By using the module to collecting data about current projects, it is possible to use the tools for teaching purposes. It is possible to also check how the knowledge possessed by the head is sufficient to implement the project. Developed module (plug-in) will include the possibility of an individual assessment of the decisions taken by the project manager (and / or by an expert). As a result, it becomes possible to better learning - basing on experience. This is due to the fact that the project manager can respond to the historic decisions and verify whether his proposed decision (if it complies with the appropriate project) proved to be effective or not.

In order to better inference on the basis of decisions taken, authors of solutions benefit from the developed at the University of Newcastle (Australia) way of codifying
knowledge in the form of SOEKs (Knowledge and Experience). The technical details of the module are described in other articles the authors. Current state of research on this solution can predict that this module will assist project managers in making new decisions and just the learning based on experience.

8. Conclusions

The purpose of this chapter was to provide directions for the development of project managers' education based on knowledge and experience management. There is presented in the chapter the importance of knowledge and experience in managing the project at all stages of the project. Also there is shown that aspects of knowledge and experience management form the backbone of the popular project management methodologies such as PMBoK or PRINCE2. There is also idea to refer that aspect of management experience to the education of project managers. On the one hand, managers must be able to use the knowledge in the course of project implementation, on the other hand, however, they need to understand the processes of management knowledge and experience. Therefore, it was necessary to focus on how to educate project managers to effectively take advantage of the knowledge and experience. They should know how to manage them during realization the project.

Education project managers is dominated by two typical educational approaches based on the experiences of the project. The first consists in the analysis of case studies, the second relates to the use of simulation environments of project management. In this chapter, emphasis is placed on the aspect of learning using case studies. Reference was made to the typical structure of case studies pointing to some gaps, which can be supplemented by a new approach. This highlights the stability of typical case studies that relate mainly to describe a simplified state. This gap (i.e., the inability to verify the knowledge developed during the learning through case study) is decided to complement presenting the concept of using project management tools and the knowledge accumulated in them during the implementation of specific projects.

Presented - new - approach shows that on the basis of project data contained in the repositories of projects it is possible to use the experience for educational purposes. By the dedicated module collecting key information about the project (the most important decisions made during its implementation) project managers can check the effectiveness of their decisions. It becomes possible to predict the consequences, and discovering decision already taken. Thus educated persons can verify their decisions with assessments carried out on the project and included in the repository. As a result, managers can avoid making mistakes and develop alternatives.

Completion of the described module is planned in the end of 2014 and then there is a plan to deploy it to the classes conducted at the Faculty of Management and Economics at the University of Gdansk.
9. References


Summary

The purpose of this chapter is to indicate the need for project management experience and knowledge in order to improve the competence of IT project managers. In the first part of the chapter there is shown the impact of experience on the development of project management skills. Also the need for having historical data about the projects - in order to make better project decisions - is shown in the chapter. In the following parts of the chapter, there are information about importance of case studies for acquiring knowledge about PM. There is also presented a case study model for the purpose of improving managerial skills. The chapter is finished by the presentation of the concept concerning saving project experiences to improve project management. There is also presented the concept of expanding PM tools for external modules allowing to analyze early project decisions. These modules can be used to make better decisions in future projects and also have educational role by enabling access to historical knowledge from completed projects.
1. Introduction

The contemporary circumstances force small and medium enterprises (SMEs) to introduce modern teaching techniques, which are supposed to serve the development of entire groups of employees, including managers. The well trained managers who may become a source of competitive advantage for their firms. The process of development of the key worker is oriented on elasticity; it operates within flattened and de-beaurocratised management structures, which accelerates flow of information and facilitates decision making.

The aim of the present chapter is to present the specific character of development of SME managers' competences in the Polish economic conditions via implementation of modern teaching methods. The presentation of the existing differences in education in Generations X, Y & L is our additional objective.

2. SMEs` managers

Small and medium firms (SMEs) determine economic development, generate a half of the Gross National Product and exert influence on the level of competitiveness of Polish economy.
P. Drucker considers small and medium firms to be the „salt of market economy” and a guarantee of a democratic shape of an economic system [Safin, 2003, p. 7]. In SME sector enterprises there work about 70% of the work force and about 60% of the people employed in Poland. In Poland there operate about 1,700 SME millions and they constitute 99.8% of all the enterprises operating in Poland. The SME sector in Poland is to a greater extent dominated by micro firms than in the UE, and their participation in the total number of enterprises amounts to 96%, which exceeds the European average (91.8%).

Polish small and medium firms develop more quickly than enterprises generally do, clearly more quickly than their partners from Western Europe, and sometimes even more quickly than in the other countries of our region. It is a very significant fact that they also reach a higher degree of effectiveness in their activity, expressed in the gross added value per 1 EURO of remunerations and 1 EURO of personal costs. The specificity of SME management results most of all from the character of their functioning. A small firm is not a miniature of a big enterprise, either [Simon 1999, s. 7].

SME manager is a flexible person, adjusting their way of management and training to the challenges resulting from the turbulent surroundings, immediately reacting to the changing demands of the market. They operate within flattened and de-beaurocratised structures of management, which precipitates communication, accelerates flow of information and facilitates decision making.

3. Differences in X, Y, L generations

In the literature on the subject we can encounter the division of a generation into the following categories: traditionalists (born between 1925-1945), Baby Boomers (born between 1946–1964), generation X (born between 1965–1980) and generation Y (born after 1980) [Jamka 2012, pp. 237-238].

One of the challenges faced by modern managers from generation X is an effective management of generation Y, i.e. employees who are under 30. The differences between generation X and Y in the understanding of norms and values or in the perception of the world are significant, that's why the process of teaching looks completely differently.

Generation X born before 1980, are represented by over thirty-year old persons, for whom work was and is most important. Their education had place within the traditional framework of teaching, with blackboards, white chalk, the traditional piano as well as paper manuals. Whereas persons born in the middle and at the end of the 80s, „Ys”, do not live to work but work to live. They are young people brought up in the world of new technologies, for whom there is no life without computers, smart phones ant the Internet. For generation Y such things as, among others, flexible working hours, results-related remunerations, and chances of promotion are important. They do not use libraries, do not like paper newspapers and writing by hand. On the other hand, they
use the keyboard and the Net very efficiently and there is where they find answers to all their questions (see table 1).

Table 1. Generation differences

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Priorities: loyalty, focusing on history, anxiousness</td>
<td>Priorities: optimism, a hierarchy of values and life strategy, stabilization</td>
<td>Priorities: carefulness, innovation interest, but based on quantitative data</td>
<td>Priorities: life around media and flash, participation in experiments, life long learning, relative closeness of peers</td>
</tr>
<tr>
<td>At work: worship of heritage, resistance to changes, a method „through trial and error”, unnecessary communications, pension claim</td>
<td>At work: interest of development and career, money as a value, need of recognition and prestige (function, post, own office), resistance to changes at work = a loss of own position, difficulties in pulling together in turbulent environment, occasional communications, development – only when influences on promotion or salary rise, well-deserved pension</td>
<td>At work: change-orientated, change-able career (every few years), award for a work progress means „freedom” in decision-making and management, being always on the go, relax when retired, need of regular communications (different forms), self-development (courses) as a source of career planning</td>
<td>At work: a few tasks made simultaneously (a few careers) choice of work, that is only interesting and in accordance with interests, Work is not the most important, being in different projects/tasks, requirement of feedback and constant learning, a lack of retirement plan</td>
</tr>
</tbody>
</table>


*Generation Y has many names: Millenials, Generation Next, Generation Why?, iPod Generation.
Apart from generations, mentioned above, we need to remember about that group of consumers, who will come to the market in 10-15 years L Generation (also called Millennium Generation, because they were born in 2000 or later). We can’t find any notes about them in literature, but they exist and they are the economic important buyers, even now, when they are at school.

Letter L comes from verbs and nouns, that define Generation L - lazy, like, link, lead, life-stream, local. Lazy – generation L isn’t interested in any activities, physical and mental efforts – they don’t create, don’t protest and they don’t have any established convictions. Distinctive feature for L generation is so-called slactivism (slacker and activism). They have a passive behaviour, limited to click „like” on Facebook. They aren’t curious about people and the world. They limit to their own friends, and they look for a support within familiar environment. Their activity brings only to sending petition for or against something (not to creating, but to accepting) and voices their opinion in social media. The tool used everywhere and in every situation, is mobile, laptop or tablet. A word becomes a picture, that is why application like twitter, instagram, snapshot, dropbox etc. have become popular and popular.

The L Generation, like Y is dishonest to work and its employer. They „forget about others so fast as they click in computer keyboard” [Święcicka 2012, Generacja leni – slaktywiści. Czy można zbawić Świat klikając myszką?]. The next feature is „linking”. They are used to Internet without content, but stuffed with many links. Bill Gates said „content is king”, but nowadays we should say for blogger N. Hatalska, L generation doesn’t create content, but distributes them, so the more real is a statement „distribution is queen” ([Hatalska 2011, Generacja L (Infografika)]).

They also enjoy reading a short texts and news, called leads. The research shows, that more than a half of Poles population doesn’t read books or any short texts, articles etc., more extensive that three pages. They also don’t protect their privacy. They want to be like young celebrities, so they reveal all information on their private life and career. They are constantly on-line and every invited person can get the information about their life (life-stream) and his location (local).

4. New learning process in SMEs for new generation

In literature there occur various terms referring to problems connected with work force development. There are such terms as: education, training, training for a job, self-improvement, in-service training, learning, professional development. In lectures subjects the notion of development is usually identified with the notion of work force training. Such an approach was assumed by known researchers and authors of many acknowledged publications, R. Hill and J. Stewart [Hill, Stewart 2000, p.108]. Using the notions: „training” and „development” interchangeably means a broad understanding of the notions of training and development as activities, which develop skills and/or knowledge, and/or shape behaviours. The range of activity is wide, from formal train-
ing programmes run by external and internal trainers to informal trainings on the spot, at work. It also includes other activities such as job shadowing, which can be termed as a method of learning by imitation ("being a shadow" of another, experienced worker) as well as coaching, mentoring [Hill, Stewart 2000, p.108].

In view of the specific character of small and medium enterprises, an elaboration of effective development plans, taking into consideration the needs of both the workers and the employers is essential. It is important to prepare at least annual plans taking into consideration key trainings and development programmes. Small and medium enterprises should not, however, limit themselves solely and exclusively to the realization of external training sessions, but they should also exploit other forms of development such as internal meetings, presentations, discussions, or individual forms of development basing on coaching or mentoring. [Aleksy Pocztowski, Urban Pauli 2013, p. 10].

Coaching and mentoring are modern methods of teaching. Coach is a trainer who stimulates and motivates employees to undertake an effort of their own personal development. They are, therefore, a sort of partner and not a person superior with respect to the developing individual. Usually their role consists in diagnosing the strengths and weaknesses and proposing, basing on such a recognition, concrete development activities. Mentoring, in turn, is of the master – disciple kind of relation. It is based on inspiration, stimulating and leadership. The main tool of the mentor is a constructive dialogue based on an exchange of views as well as on formulating such aims for the trainee which are very closely related to their unique potential.

The development of the employees of small and medium enterprises usually takes place in an informal manner, with a predominance of internal training sessions, informal job instructions and socialization [Cardon and Stevens 2004, pp. 310, 318]. Developing employees via "on the job trainings" seems the most effective method. Such trainings consist in learning “at the work post”, where employees learn what they need most at a given moment [Hill 2004, p.12].

"On the job training" is used mostly because of the low costs involved and a possibility of an immediate application of the acquired knowledge or skill [Beaver, Hutchings 2005, p.596]. In addition, the possibility of transmitting of the specific competence, unique for each given organization, is their important advantage [Rowden 1995, p.364]. These trainings focus on the concrete needs of the employee and allow for an easier integration with everyday duties [Mayson, Barrett 2006, p.450].

In addition, the evaluation of effectiveness of the realized trainings is very important for the level of professionalization in the field of trainings and development. Evaluation should take into consideration not only the reaction of trainees, but in the first place their influence on the changes in the manner of performing the tasks and the obtained business effects.
5. Design of a learning process for SMEs managers

The design of learning process follows different phases. They are identical, no matter what the design project is. They are also similar to the creative process existing in different cultures. But the design process is unique, because of final, visual output. Creating, for designers, means a problem difficult to solve. If the problem is identified (e.g. working with different culture environment), designers follow a logical process that they apply to every phase of project. This process is learned skill that corresponds to techniques not to creativity. It’s worth saying, the process is the same, when company uses from external agency works or chooses its own design service department. There are three main phases of that creative process [K. Best, p. 14]:
- an analytic stage of widening the observation field;
- a synthetic stage of idea and concept generation;
- selecting the optimal solution.

Each process corresponds to five phases (see table 2), which have their own objective and correspond further to different visual outputs.

<table>
<thead>
<tr>
<th>PHASES</th>
<th>OBJECTIVE</th>
<th>VISUAL OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investigating</td>
<td>IDEA</td>
<td>Brief</td>
</tr>
<tr>
<td>2. Research</td>
<td>CONCEPT</td>
<td>Visual concept</td>
</tr>
<tr>
<td>3. Exploration</td>
<td>CHOICE OF STYLE</td>
<td>Roughs of ideas, sketches, \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roughs of presentation \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduced-scale model</td>
</tr>
<tr>
<td>4. Development</td>
<td>PROTOTYPE DETAIL</td>
<td>Technical drawings \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Functional model \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-D mock-up for visual correctness and working capabilities</td>
</tr>
<tr>
<td>5. Realization</td>
<td>TEST</td>
<td>Documents of execution \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prototype</td>
</tr>
<tr>
<td>6. Evaluation</td>
<td>PRODUCTION</td>
<td>Illustration of the product</td>
</tr>
</tbody>
</table>

The first, preliminary phase is investigation. This prospective phase shows an opportunity or potential need, that must be identified and ideas, that must be generated to highlight, if the goal is to turn need into a design concept. It is obvious to widen the field of investigation in order to identify a problem, which can be solved by design and requires creating client brief (the client means both buyer and employer). It should describe what the organization wants to achieve, the market opportunity identified, an estimate of the budget and time allocated and any key deadlines. The client representative, who is responsible for writing that draw should also clarify needs and project parameters. Then this brief is given to design managers (the creative director or project manager) for feedback. A whole dialogue is based on establishing how design can help to achieve client’s objectives and expectations (see table 3).

Table 3. The client brief

<table>
<thead>
<tr>
<th>Element</th>
<th>Contains</th>
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</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Information about the project background and opportunity identified</td>
</tr>
<tr>
<td>Company</td>
<td>Information about the organisation, its brand values, methods of operation and its existing customers</td>
</tr>
<tr>
<td>Customers</td>
<td>Information about the organisation’s target customers</td>
</tr>
<tr>
<td>Competition</td>
<td>A review of the organisation’s competitors and their unique selling points</td>
</tr>
<tr>
<td>Positioning</td>
<td>Information about the proposed strategy and plan for action</td>
</tr>
<tr>
<td>Design challenge</td>
<td>Information about project objectives, scope of work, expected outcomes and specifications</td>
</tr>
<tr>
<td>Metrics for success</td>
<td>An outline of how the project’s success will be measured</td>
</tr>
<tr>
<td>Programme plan</td>
<td>An outline of the project’s stages, phases and milestones</td>
</tr>
<tr>
<td>Costs</td>
<td>A list of fees, expenses and production costs</td>
</tr>
</tbody>
</table>


The phase, called 1, by B. Borja de Mozota, is research. The project manager tries to inquire about the opportunities and the importance of the project and uses the different audience responsible to decision-making to launch the project. He takes care about positioning of the product in competitive market and explores technical and functional
parameters of the project. This phase often leads the project manager to accumulate documentation on the “environment” or context of the project. There are bidirectional objectives [K. Best, pp. 14-15]:

- to draw a diagnosis of the project,
- to define a visual concept.

Next phase is exploration. After understanding an issue, project managers must use all available resources to concretize the concept by making written examples of the different shapes the project can take. This phase ends with the selection by an audience that includes the client of one or two directions. This selection is possible thanks to diagnosis of the wide range of solutions in relation to the priority of desired functions, defined in the client brief.

Presentation allows gaining a constructive feedback to establish all details and visual elements of the project. It also helps to improve chosen directions, taking into consideration aesthetic, functional and technical limits. The established result of this phase should be developed in the following phase.

The phase of development focuses on presenting the chosen solutions in three dimensions. A functional life-size model is made, so the project manager makes a technical plan of the prototype. This model is also used to generate marketing tests. After them, the final model is adopted and this creative phase of the process is finished.

The fourth phase is realization that means designers work on the realization of prototype for the project. The plan identifies materials used and characteristics of elements of the product. Comparing with previous phases, this one is time-consuming, because it requires connection of different factors – internal and external resources.

In the last evaluation phase, the tests are launched in three different directions [K. Best, p. 16]:

- technical control – norms of use, security, durability etc.,
- calculation test – preparation of production programs,
- marketing evaluation: brand values, target market, market share objectives - market evaluation is conducted earlier, but it is commonly known the consumer preferences and behaviour can be changed during prototype testing.

This process can highlight the ability to understand and influence how people give meaning to things. It consists of three actions.

The first one is listening. It is the action of gaining a knowledge about possible new product meanings by interacting with interpreters e.g. people, cultural organizations, the media, sociologists, marketers, retail and delivery markets, designers, technology suppliers, artists, research and educational institutions, developers of pioneering institutions etc. Companies that can listen better develop privileged relations with a distinguished group of key members. These key interpreters are forward-looking researchers who are developing unique visions about how meaning could evolve in the life context.
Those companies that realize design-driven innovations are better than their competitors at attracting and interacting with their environment.

The second action is interpreting. The aim of this step is to allow a company to develop its unique proposal. This process is driven inside the company and means that company assesses knowledge it gains by interacting with interpreters and then redesigns this knowledge with its own insights, technologies and assets. Its outcome is the development of a breakthrough meaning for a product basket.

The third action is addressing. Radical innovations of meaning, confusing people being unexpected are the steps to prepare the ground for ground-breaking proposals.

Companies can innovate in both dimensions, so its strategy is better conceived as two dimensional. The most important is innovation can be either incremental or radical in both dimensions.

It is known, incremental innovation in meanings is much more often than breakthrough. Companies in their whole life adapt and update the language of their products and service to match gradual changes in taste e.g. in fashion, companies adapt the style, colour, shape, length often without questioning of basic meaning of skirt or pair of boots.

6. Conclusion

Young consumers, represented Y or L generation are defined by their future employers as slackers, who are not fit to any position. This way of thinking is shown in many professional articles and Internet sites, so the main aim of designing the learning process of managers is to change their attitude towards young generations (both Y and L). Especially as simplifying can bring opposite effect, because it doesn’t make efficient work, tolerance and understanding at work – the only one result is conflict between younger and older employees.

7. References:

Design of a learning process for SME managers (in different generations)

Summary

The subject of work is designing learning process for managers (in different generations). The elaboration was based on the following methods: critical literature analyses and long-standing trainers’ experience. The main result is an identification that designing of learning process seems to be essential due to the age specificity of managers.

The cognitive research, described a process of the acquired skills and knowledge, shows three main forms of cognitive activities: formulation of the learning goals, introduction of cognitive strategies and using an assessment strategy. Thus, the learning process is seemed to be equal with formulation of learning strategy that is allowed audience to better organization and elaboration and creates a favorable understanding of the topic or issue by using an individual preferences and development chances.

We suppose that generation problem is more important that finding new methods or techniques of learning. Nowadays trainers try to find innovative ways of trainings, meanwhile almost every company, that employs people in different age should focus on coaching, that result is changing attitude to newcomers. We must accept a present culture with all its mess. What is significant, even the current culture is called „nano-second culture” to point out the constant changes and living in rush. The new process
of learning must be aimed on understanding and creation of a new models of cooperation all different groups of employers. To achieve that goal, managers for SME sector should be learned how to implement a new initiatives for team-building, and which take into consideration work-life-balance idea and different career-development tracks, that are adapter to all group mentioned above – elastic motivation systems.
Personal learning environments of Polish academic participants
Tatiana KURBANOW *

1. Introduction: attributes of contemporary learning and the impact of technology

* In the digital age, learning can and must become a daylong and lifelong experience. Mitchel Resnick, “Rethinking Learning in the Digital Age”, 2002

The following chapter presents the results of the pilot study aimed at identifying what kind of Personal Learning Environments Polish academic participants construct. Though the research group participating in the study was rather limited, the obtained results give the preliminary insight into the problem and can be used for further design of a more in-depth case-study.

Due to ubiquitous digitization of the contemporary society, more and more segments of our vital activities are growing dependent on it, and the sphere of education is not the exception. Successful functioning in an advanced industrialized society imposes on graduates the need to upgrade their knowledge, skills, qualifications throughout their working careers, in order to keep pace with the adaptation and implementation of new sophisticated technological solutions constantly applied in the corporate world. Lifelong learning is contemporarily viewed as an integral part of the education in future.

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Ubiquitous computerization has changed the very nature of learning. Present-day learning, as described by Ilona Buchem & Mar Perez-Sanagustin (2013, p. 3), has the following attributes:

- learning is multi-channel, since learners can gain data and information from different sources, not only paper-based, but also digital; not only from the authoritative providers, but from anybody who publishes on the Internet;
- learning is multi-objective, as it supports not only formal educational goals set on a student by the institution, but also learner's individual learning goals, personally meaningful for him/her, realized in frameworks of personally created learning patterns;
- learning is multi-context, as it is not limited to the physical location of the learner's institution, but can happen at any time and anywhere, at the university, at work, at home, at vocation, in isolated places;

Graham Attwell (2007, p. 2) adds that contemporary learning is multi-episodic, meaning by “episodes” the time a student spends at institutional learning. Attwell argues, the previous scheme of divided life-spans devoted first to education, and later to working career is now upset: during working career, a person is likely to indulge in formal learning, provided by educational institutions, several times (to take IT, foreign languages, post-graduate courses, visit workshops, train for a new occupational career). An ambitious specialist usually connects those episodes of formal learning by self-initiated informal learning.

Educators have to work with a fundamentally new cohort of young people. The 2009 Horizon Report affirms, “Today's learners want to be active participants in the learning process – not mere listeners; they have a need to control their environments, and they are used to easy access to the staggering amount of content and knowledge available at their fingertips” (Johnson et al. 2009, p. 5). Fortunately, modern technology and the Internet have the potential to make learning more student-centered, to give students more independence in setting and pursuing individual learning goals, and to teach students to be more responsible for the learning process and the outcomes.

Education can benefit from technology due to the two promising advantages of the latter: 1. it provides extensive access to free reliable online resources; 2. it allows communicating and socializing of the users.

Information infrastructure has expanded from the institutional library to the global cyber infrastructure. Open Educational Resources (OERs) available online include the whole range of free high-quality educational content which can be legally used by self-learners, students, and educators worldwide. They contain curriculum maps, course materials, textbooks, streaming videos, podcasts, multimedia applications, etc. Teachers can also make use of OpenCourseWare (OCW), i.e. university-level educational materials, organized as courses and often including, apart from the thematic content, course planning directions and evaluation tools (Butcher 2011). Another kind of the
OERs are Massive Open Online Courses (MOOCs), offered by renowned universities (e.g. the Massachusetts Institute of Technology, Harvard University, Stanford University and dozens of others) on such Web platforms as Coursera.org, Udacity.com, edX.org. After registration, every user gains the opportunity to study a college or university level course, get learning materials in the form of video lectures and/or readings, create learning communities with other course participants, and earn a certificate of participation on condition the learner finishes the course successfully.

Communication and socializing via the digital channels has become possible due to the rapid development of social software on the Web 2.0. The concept of social software unites all the tools which allow people to connect, communicate, and create networks (Attwell, 2007). Social media help to form human networks for mutual learning, and provide insight into how other students worldwide work on similar learning tasks. Thus, the Internet is not only the repository of resources, or information delivery vehicle, but also the virtual space for building connections with other learners, sharing views and content, reflecting and shaping ideas.

This way, the new learning paradigm is no longer based upon the idea of an omniscient teacher transmitting data and information to passive students, with all limited by rigid curriculum. Rather, the vision of contemporary learning stimulates student active discovery of personally meaningful educational content in accordance with their learning preferences. Quality educational interaction between students and teachers granting students more independence, reflection, and consciousness in learning is an essential constituent of the new learning paradigm. The curriculum and teaching are becoming more flexible, allowing individuals to move along their own learning trajectories.

2. The concept of Personal Learning Environment.

Personal Learning Environment integrates into a coherent entirety the wide range of resources, contexts, and services a learner utilizes in his/her educational activities. EDUCAUSE defines Personal Learning Environment as a combination of “tools, communities, and services that constitute the individual educational platforms learners use to direct their own learning and pursue educational goals” (EDUCAUSE 2009, p. 1). Scott Wilson et al. (2007, p. 176) and Graham Attwell (2007, p. 7) state that PLE is not a software or a desktop application, but rather a pattern learners create to learn with diverse technologies, or a new approach to the use of technologies for learning. Alec Couros (2010, p. 125) understands PLEs as “tools, artifacts, processes, and physical connections that allow learners to control and manage their learning”.

PLE brings together all sorts and episodes of learning: institutional learning, informal learning, workplace learning, learning from home, learning driven by problem solving, learning motivated by personal interest (Attwell 2007). PLE admits learner's independence from the educational institution, where the balance should be found between institutional learning and learning in the wider world (ibid.), and between teach-
er control and learner’s independence (Drexler 2010a). PLE unites both virtual learning spaces and physical ones; digital resources and paper-based content (Buchem & Perez-Sanagustín 2013). Gradually, the student gets used to moving around the both learning settings, taking advantages of each of them.

There is unanimity among scholars as for the fact this is the self-directed learner who stands in the center of the PLE (Attwell 2007; Buchem & Perez-Sanagustín 2013; Couros 2010; Drexler 2010a, b; Siemens 2005; Wilson et al. 2007). The user of the PLE is its owner, and he/she makes the decision which components to include into the network, which knowledge bases to visit, which social networks to join, and which contexts to give the priority. The learner selects and organizes appropriate resources, manages contexts, chooses and adopts the services and tools which suit particular tasks, and estimates if certain content meets his/her learning objective (Wilson et al. 2007). Therefore PLE is unique with every learner, and it is adaptable to his/her educational needs, preferences, and style of learning. Self-direction in learning is realized by student managing his/her time and work load while realizing the particular learning task, and the decision how deep to go to investigate it. Much self-organization, ability to set clear learning goals and achieve them, consistency in learning strategies is also required. Students take more control over their learning, but at the same time more responsibility as well. In general, to be successful the learner must be mature enough.

PLEs emerge from various and robust platforms. The function of the technology is to provide a framework for the learners’ effective use and aggregation of different Internet or computer services and applications in a single virtual space (Attwell 2007). PLEs can emerge on the basis of Learning Management Systems, (or Virtual Learning Environments, as they are known in the UK), on social software applications (blogs, wikis, social networks), or on personal Web pages including the RSS, e-mail, personal blog, note taking programme and calendar, social bookmarks and any other relevant content (Attwell 2007; Drexler 2010a). Incorporated technology is viewed as a partner for learning rather than a repository of resources (Drexler 2010b, p.12).

Not only students, but also teachers can leverage from the technology potential for their professional growth. In his article, Alec Couros (2010, p. 124) introduces a diagram of a networked teacher which he considers to be also a PLE diagram. The networked teacher consumes and produces content through the combination of digital and physical channels: print and digital resources, social bookmarking, colleagues, family and local communities, online communities and digital forums, blogs, wikis, video conferences, chats and IRC, microblogging, social networking services, digital photo sharing.

Wendy Drexler (2010, p. 372) adapted Couros’ diagram in regard to a networked student, grouping all the educational resources a student can use for learning into 4 major categories of contacts, synchronous communication, information management, and Really Simple Syndication (RSS), each realized by means of diverse tools adapted for learning. Among such tools the following can be mentioned: language tools (online
dictionaries, word lists; thesaurus); text editors and word processors for writing texts; calendars; media players (for streaming audio and video, and for creating podcasts); academic search engines, databases, Internet public libraries and archives (Google Scholar, Microsoft Academic Search, the British Library Catalogue); search engines for reading social media (Technorati, Google Blog Search, WhosTalking); services and devices for content storage (hard drives, virtual discs; the system of online bookmarks); educational games; online quizzes; tools for creation of presentations (PowerPoint, Prezi); content management systems for creating web sites; services for content and video sharing (SlideShare, Flickr, Google Photos; YouTube; BlipTV); online maps and GPS; newsreaders.

Students will not necessarily adapt each of the tools available, but will choose most appropriate from their personal point of view. Yet, technology is not the target in itself. It is not the number of services and tools the learner incorporates in his/her PLE that determines its value, but the benefits the learner manages to take from the technology in order to enhance own learning. Students learn not due to the technology, but through the technology (Drexler 2010 b).

Alec Couros (2010, p. 125) differentiates between Personal Learning Environment and Personal Learning Network, which he defines as “the sum of all social capital and connections that result in the development and facilitation of a personal learning environment”. The value of online learning communities is immense. While in the traditional classroom settings there is a possibility only for a limited number of viewpoints (the author's of the textbook, the teacher's, perhaps that of a number of co-students), PLN expands to include co-learners, educators, theorists, and profile experts from other institutions, educational systems, countries to give the learner a more diverse perspective of the problem under study (ibid.; Drexler 2010 a). The external learning communities have an advantage before course-based communities, since the former unite users by intrinsic educational interest, and not by a particular course the learners are taking at the moment. Hence, the learners are likely to remain in the community much longer, than duration of an academic course, continuing their self-initiated learning (Couros 2010).

Interest-based communities, which users join with the aim of socializing on topics of interest, should be differentiated from online learning communities, which unite people by the common aim to study. While the latter is a constituent of the PLE, the former can be considered as such only if the discussion contributes considerably to the user's knowledge expansion in a particular field of knowledge.

PLE becomes a student’s individual virtual learning space, and at the same time a shared space for academic communication, with the knowledge placed in multiple nodes which the learner can re-visit, activate, extend, or change at any time in future. In case the learner chooses to abandon the old PLE, if created as an open resource, it still remains a strong node from which others can learn (Drexler 2010 a).
Once familiar with the strategies how to construct PLE for investigation of a particular learning task, learners are equipped with necessary knowledge and practical skills how to do it in future beyond the classroom walls, and can apply the previous framework to investigate any other learning problem, this time independently. This way, the educational establishments can prepare future graduates for after-university lifelong learning (Attwell 2007; Couros 2010; Drexler 2010 a).

3. The interview concerning creating and using PLEs by Polish academic participants: description.

Inspired by the numerous advantages Personal Learning Environment offers learners, I wanted to investigate if Polish academic participants realize its benefits and use it in their formal and/or informal learning and work. **The general goal** of my pilot study was to discover how students and academic teachers construct, maintain, and use their PLEs: a) to analyze how students and teachers collect and implement in their formal/informal learning and academic work Internet resources (OER or others); b) to analyze how students and teachers use Internet for professional communication; c) to analyze how students and teachers contribute to creation of online digital content and share it with co-students/co-teachers.

**Respondents.** The pilot study involved a total of 18 respondents (11 students (61%) and 7 academic teachers (39%)) who voluntarily agreed to participate in the interview survey.

The student-respondents were enrolled in various subject areas of formal educational programmes: 5 students (45%) studied Engineering, 3 students (27%) studied Medicine, 2 students (18%) were enrolled in the Education Studies, and 1 – in Law Studies (9%). The vast majority of the student-respondents studied at the day department and did not work (8 people, 73%); 2 student-respondents (18%) studied at the extra-mural department and were additionally employed part-time; 1 student-respondent (9%) studied on the individual education plan and was additionally employed full-time. 7 student-respondents (64%) were the 1st-year students; 2 student-respondents (18%) were on their final year of Bachelor's or equivalent programme; 2 student-respondents (18%) were on their final year of Master's programme. All came from the Polish educational system.

The prevailing majority of the teacher-respondents were the academic teachers of Foreign Languages (5 people, 72%); 1 was the academic teacher of Chemistry (14%); and 1 – of Engineering (14%). All were employed full-time in higher educational establishments, with 5 respondents being in profession from 10 to 20 years (72%); and 2 respondents being in profession from 5 to 10 years (28%). 5 teacher-respondents held Master's Degree or equivalent (72%) with 3 of them being additionally on PhD programmers (43% from the total of teacher-respondents); 2 teacher-respondents held
Doctor's Degree (28%). 5 teacher-respondents (72%) came from the Polish educational system, 2 from the Ukrainian system (28%).

**Method.** The interview was realized by means of the survey containing 13 open-ended and 3 close-ended questions. I interviewed most respondents in individual face-to-face sessions (13 people, 72%), others were interviewed via individual Skype synchronous video sessions (5 people, 28%), which lasted about 25-30 minutes. The interview was conducted in the respondents' native language (Polish, Ukrainian). Since the population was relatively small, and the interview aimed at collecting data, the quantitative methodology was employed alongside with the descriptive methodology (to analyze the answers to the open-ended questions).

**Results.** Before moving any further, I intended to ascertain, if the respondents had the necessary conditions for constructing the online component of their PLEs, i.e. if they had limited or unlimited access to computer devices and Internet (if it was personal or shared), if the usage was restricted by a certain place (home/ university/ workplace), and if they were confident computer-users (obtained basic computer and Internet literacies). 17 respondents (94%) had in their possession a personal laptop with Internet access, and 1 respondent (6%) – a personal desktop with Internet access. Additionally, more than a half had a mobile phone/ smart phone with Internet access (12 people, 67%), and 5 respondents (28%) had another computer or a laptop at work. The respondents estimated their computer and Internet skills as average (9 people, 50%); above average (5 people, 28%); and below average (4 people, 22%), but admitted to have no particular difficulties operating basic computer programmers, software, and the Internet. All respondents reported using computer and Internet daily, both for studying and entertainment. Graph 1 presents the obtained data concerning opportunities and necessary skills for constructing the digital part of Personal Learning Environments.

![Access to computer devices and Internet](image)

**Fig.1. Access to computer devices and Internet.**

The first group of questions concerned search, categorization and storage of the digital content. The answers to the question: "Which online search engines do you use for finding resources?" differed considerably between the subcategories of student- and teacher-respondents. Thus, though every respondent utilizes Google search engine for
every type of search (both academic and entertainment), Google Scholar, Scopus, ScienceDirect or other scientific search engines in particular field of knowledge is regularly used only by 1 student (9%), and 4 teachers (56%). Search in online databases of libraries in order to borrow the found paper-based resource from the library was much more popular among my respondents: 9 students (82%) and 7 teachers (100%) reported to use this kind of search regularly. Search for content in international and Polish online scientific journals and downloading full-text articles was reported by 3 students (27%) and 5 teachers (71%). Only 2 respondents (1 student 9%, 1 teacher 14%) said to be using the RSS protocol to follow people or sites of their interest, either academic, or leisure. Graph 2 visualizes the obtained data.

The answers concerning categorization and storage of the digital content did not differ either between the subgroups of students and teachers, or between the type of the content (relevant to formal learning/ work, informal learning, and entertainment), therefore in the results presentation I do not group my respondents into the subgroups. Every respondent (100%) reported to systemize the downloaded digital content into the thematic folders, located either on computer device's hard drives or on other portable digital devices. The prevailing majority of the respondents (15 people, 83%) also create the system of online bookmarks. Graph 3 shows the categorization of the digital content.
As for the storage of the downloaded digital content, the options described by the respondents did not show much variability either. All respondents use built-in hard drives on their computer device, alongside with a portable hard drive and USB sticks. 12 respondents (67%) additionally save the most important content on the shared stationary computer, but only 5 respondents (28%) informed to make back-up copies of the most important content on the regular basis. CDs were reported to be used by 13 respondents (72%) for saving both academic and personal content (photos, films, music), while virtual hard drives (6 people, 33%) are used solely for saving non-academic content (photos, videos, films, fiction books in pdf format, music, etc.). Graph 4 visualizes the devices utilized by the respondents for storage of the digital content.
The second group of questions verified social communication of the respondents and their participation in online learning communities. For formal learning communication with their academic teachers all student-respondents (100%) reported to have a shared group e-mail, to which their teachers send educational materials for classes. Over the half of student-respondents (6 people, 55%) said they felt free to address their academic teachers via personal e-mail when necessary. Besides, 9 student-respondents (82%) said they cooperated with their co-students in organizing online common space for formal learning in order to share information, news, and learning content. This space was organized as a close-community group on the most popular social site among my student-respondents, Facebook. 1 student-respondent (9%) reported to use instant messaging with co-students for communication connected with their formal learning. All student-respondents (100%) also got information from their dean's offices on their University site or on the site of a particular subject. Two of the student-respondents (18%) reported, however, that these sites were not very helpful, since the information update left much to be desired. The teacher-respondents' answers indicate that not all of them (4 people, 57%) communicate with students or colleagues via group e-mail, and only 1 teacher-respondent (14%) (who was also a PhD student) was a member of a close-community formal learning study group on Facebook. 6 teacher-respondents (86%) reported to choose personal e-mail as a means for communication. Only 3 teacher-respondents (43%) regularly checked information updates on their University official sites. The rest of the teacher-respondents got necessary information directly from the dean's offices, or via a telephone. Graph 5 summarizes the electronic channels for formal learning/ work communication.

Fig. 5. Channels for formal learning/ work communication.
The next question was related to the participation in online learning communities, initiated while pursuing individual learning goals, not demanded by any curriculum. 4 student-respondents (36%) said they were members of a certain online learning community, according to their personal learning interests. They started discussions and commented on conversations, when got interested in the topic. The teacher-respondents' communication concerning their informal learning was primarily restricted to e-mail contacts: 5 of them (71%) answered they directly contacted a person of their learning interest via a personal e-mail, in contrast to only 1 student (9%) choosing this type of contact in the similar situation. Two teacher-respondents reported being members of online networks to enhance their informal learning.

![Fig. 6. Channels for informal learning communication.](image)

The next two questions aimed to establish if respondents participated in interest-based communities more willingly than in informal learning communities, and what type of electronically mediated communication they preferred (synchronous or asynchronous). The results show that student-respondents definitely favoured interest-based communities to informal learning communities (9 people, 82%), and similarly more teacher-respondents were members of communities of interest (4 people, 57%). 9 student-respondents (82%) and 3 teacher-respondents (43%) reported to actively participate in discussions or start a new discussion when interested in the topic. However, several teacher-respondents (3 people, 27%) provided the observation they found it difficult to differentiate between the "informal learning" and "entertainment online activities": they found the educational content they studied for informal learning also entertaining, while many leisure activities offered new content which was educational and contributed to the construction of the new knowledge of the respondents. Thus, the teacher-respondents could not definitely separate their participation in an informal learning community, and that of interest. None of the respondents reported keeping a blog or maintaining a personal site for sharing opinions either devoted to their non-
academic interests, or to formal/informal learning. Graph 7 resumes the respondents' participation in communities of interest.

Fig. 7. Participation in interest-based communities.

The subgroup respondents' answers concerning informal electronically mediated communication for pleasure differed considerably. Thus, student-respondents named Facebook as the most convenient tool for both synchronous and asynchronous informal communication (10 students, 91%), many also regularly used Skype (8 students, 73%), or Google messenger (5 students, 45%). 6 student-respondents (55%) reported to use emails for sending private entertaining content to their friends or family, such as photos, videos, music, films, in case they wanted to keep it private from demonstrating to a broader circle of friends on Facebook. As for the teacher-respondents, their attitude to communication on social sites with friends and family turned out to vary greatly from person to person. 3 teacher-respondents (43%) used the social site (Facebook) and the instant messenger Skype for synchronous communication, 1 teacher (14%) utilized Google messenger as well. 3 teachers (43%) used also asynchronous communication via email or Facebook. One teacher-respondent informed she was not registered on any social site, as she thought such communication could not substitute face-to-face contacts. Another teacher-respondent imparted to be very passive on Facebook, even though she had an account, since "She was not an exhibitionist" to demonstrate the details of her personal life to the whole world. On the contrary, another teacher-respondent commented she appreciated communication on social sites since it allowed her to avoid personal contacts with people she did not want to meet in person. All teacher-respondents reported they used electronic channels for informal communication mostly in cases, when meeting in person with friends or family was impossible, undesirable, or awkward, expressing a strong preference of face-to-face contacts.
The third group of questions considered sharing of information and creation of online resources. To the question "Have you ever published online any of the content you personally created (e.g. compositions, reports, project results, presentations in PowerPoint, research papers, thesis, articles, photographs, videos, etc.)?" the answers differed considerably between the subgroups of students and teachers. 6 teacher-respondents (86%) and 2 student-respondents on the Master's programme (18%) reported, the academic content they created happened to have appeared online independently from their intentions: e.g. the placement of the Master's thesis or the doctorate dissertation on the online database was a demand of their formal learning institution. Moreover, 6 teacher-respondents (86%) had publications in online scientific journals. The answers of the rest of the student-respondents to this question were negative. In contrast, when asked about circulating among friends any content for entertainment, all student-respondents (100%) and 3 teacher-respondents (43%) answered positively: they regularly and actively send friends personal photos, videos, links to films, music, games; or they placed such content on their personal page on Facebook so that their friends or colleagues could access it. As for informal learning, 3 student-respondents (27%) and 3 teacher-respondents (43%) reported to forward relevant content (educational films, articles, academic books in pdf-format, information about courses, conferences or workshops, etc.), which from their point of view could interest their co-students/ co-workers. Graph 4 shows the way the student- and teacher-respondents share the information online and contribute to creation of online content, concerning their formal learning/ work, informal learning, and leisure activities.
4. Discussion of the results.

The results of the interview survey show that all respondents possess both the necessary infrastructure, and fundamental computer/Internet skills for efficient moving around the digital spaces. The respondents' PLSs are primarily constructed around personal laptops, which is very convenient for learning, since users are not restricted to a certain place or time in their educational activities.

Student-respondents' answers allow to conclude that they are rather confident about their formal learning infrastructure, with this element of their PLEs being the most diverse: students know how to maintain communication with academic teachers, with each other, how to use university library's databases, how to navigate the Internet site of their university. The student-respondents also showed themselves as confident and frequent users of the social software: the prevailing majority of them use social sites for both synchronous and asynchronous communication with their friends/co-students/family members, and for sharing non-academic content with people the respondents know in person. Moreover, most student-respondents entertain on the Internet, joining the interest-based communities for social interaction with people they do not know in person. I may risk to conclude that social networks seem to be the part of the student-respondents' everyday lives. However, the aim of this interaction is rather social than educational: students confess to connect with their friends or members of interest-based communities with no intention to study. Most student-respondents' PLEs lack the vital component of informal learning networks and informal learning itself. The expla-
nation may rest in the variety of reasons. The majority of my student-respondents were the first-year students, who were just starting their university education. The curriculum and new conditions of studying at the university may seem to the students so overwhelming, that they do not feel they have time, need, or motivation for additional self-study. The few students, who reported to participate in informal learning online, actually were the students of final years, more seasoned in learning, more independent, and being closer to the beginning of their professional careers. Another explanation may consist in lack of experience of networked learning: students may just not know that they can join learning communities online and study together and from each other. Yet another reason, the most difficult to surmount, lies in the nature of traditional academic courses, with many of them still being rather material- than learner-centered, with the content mostly provided by a teacher, and students being passive recipients of the learning material. In such educational systems students have no chance to explore topics of their learning interest, and they may be not motivated enough to pursue the individual informal learning. Anyway, the interview results demonstrate, student-respondents' PLEs are deprived of the element of informal learning and informal learning communities, though the digital component of formal learning is quite well-developed. Students seem to be good learners mostly when being guided.

The analysis of the teacher-respondents' answers indicates they are confident at finding additional resources to enrich the educational content of the university course they teach, either in libraries databases, or full-text educational content. Nevertheless, when it comes to sharing the materials on the Internet or participating in the creation of the online resources, the teacher-respondents contribute to it only indirectly: if the resources they created do appear online, it is not initiated by them, but is rather accepted by them as an inevitable fact. The teacher-respondents turn out to be the consumers of the Internet educational content, but not the producers. In general, the teacher-respondents seem to be rather passive viewers than active participants on the Internet, at least in comparison with the student-respondents: the former e-mail, socialize, comment in communities less than the latter. Although only one-third of the teacher-respondents report to build online professional connections in the communities of learning, it should be kept in mind that it is difficult for the teacher-respondents to differentiate between informal learning and entertainment: these two activities penetrate into each other. Only one teacher-respondent reported to have taken a Massive Open Online Course and be the member of the educational community Coursera. No teacher-respondents provide a personal blog. From those facts, another observation relating the computer-mediated communication occurs: contrary to the student-respondents, the teacher-respondents definitely prefer one-to-one e-mail contacts to many-to-many conversation mode on forums of educational networks or interest-based communities. Summarizing, teacher-respondents' PLEs do contain certain digital elements relevant to their work, informal learning (professional growth), and communication, but their PLEs are also considerably based on traditional components.
The general conclusion from the study is that the respondents do not wholly realize the learning potential the Internet offers. Obviously, though students are good at guided learning and familiar with the Internet services and tools, the realm of their self-study remains unrealized, at least online. Learning appears to be rather an individual experience, while entertaining is shared. The same is true about the teachers: very few treat the Internet as the new settings for professional growth and informal learning. The teachers seem to treat the Web primarily as a huge repository of useful resources, and only in some measure as the medium for social academic interaction. Learning seems to be still traditionally tied to the classroom and university premises.

5. Conclusion.

Evidently, my research group was very limited. As follows, the interview results can be treated only as the attempt of a preliminary insight into the subject matter, which could prepare ground for a more in-depth and structured case-study. It is difficult to predict, if comparable results would be obtained within a more numerous or homogeneous research group, or with respondents belonging to the same field of knowledge. It would be interesting to compare Personal Learning Environments of less experienced learners, e.g. first-year students, with that of more seasoned learners, e.g. students on Master's or PhD programmers, or contrast the Personal Learning Environments of students and teachers, or of learners coming from different educational systems. Such study would allow to make conclusions about PLEs elements and their development over time and experience, and consequently to work out strategies how to guide students in constructing better-designed and more sophisticated PLEs to be utilized by them in after-university careers for lifelong learning and knowledge update.

It is an obvious fact that with every decade, education is becoming more digitized, and the accents are being shifted from guided learning supervised solely by the teacher and the rigid curriculum to the more independent learning, initiated by students, where learners' personal educational preferences are taken into account. Personal Learning Environments have the power to unite formal and informal learning, expand learning beyond the classroom, connect different types and episodes of learning, as well as they offer learners the tools for sustainable lifelong learning. Hence, I am deeply convinced Personal Learning Environments deserve further research and wider application not only in informal learning, but in institutional education as well.

6. References:


Summary

The chapter presents the pilot study that aimed to identify what kind of Personal Learning Environments students and academic teachers construct: how they collect, share, and maintain digital resources; how they contribute to creation of online content; how they use social Internet services and tools for academic communication. The study was realized by means of the interview survey aimed at collecting data, and both quantitative and descriptive methodology was employed for the results analysis. The study reveals that all respondents construct Personal Learning Environments with both digital and traditional components. In student-respondents' PLEs the one of the most significant elements was the computer-mediated communication, while the teacher-respondents' PLEs contained a powerful feature of search of the online educational content with further application in formal learning courses.

The theoretical part of the chapter provides a brief outline of the concept of the Personal Learning Environment, describes its assets, theoretical pedagogical foundations and technical solutions for its integration into the formal learning process.
Evaluation of the employee development system
Viera MARCINOVÁ *

1. Introduction

The 21st century has brought many opportunities for enterprises, but also increased pressure on productivity, which is automatically transferred to the employees. Companies in global competition are seeking for world-class performance.

The necessity to achieve world-class standards and gain a global competitive advantage leads to the focus of many companies on investing in people and building high-quality, flexible, properly motivated and committed workforce. Companies, which are seen as world leaders, focus on the development of employees.

Company employees are carriers of human capital. To create human capital means to work with each employee, motivate him/her to higher performance, to develop its givens, to stabilize him/her in the company. This is an area in which the human resources development meets Psychology, Adult Education and other scientific disciplines focusing on human being.

The aim of this chapter is to identify the best way of evaluation of the human resources development program. It gives a conclusion on researches provided by professionals and experts in human resource development. Quotations are addicted to understanding the position of human resources development and the impact of HRD interventions on organizational performance.

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2. Influence of human resources onto the company success

Employees are able to contribute to the achievement of corporate objectives on varying degrees. R. Walker (2003) justifies the contributions of employees as independent investors of human capital in the form of time, talent, effort, energy and commitment. At the staff is no more looked as the cost item or asset holdings, but as a human capital. As reported: "Employees are separate and independent investors of their human capital and may be free to decide whether and to what extent they will be involved in the company in which they are working. They can dive deeply into solving business tasks and energize, they can refine their skills to the highest possible level or from the unknown reason they can stand aside." (Walker, 2003, p. 92).

Contribution of employees for business development elaborates H. Levinson (1994, p. 433): "We know that people have different levels of their conceptual capacity and proceeding in different ways to achieve maximum performance at given time. There is no explanation for this kind of evaluation skills and even attempt to predict when this ability is probably matured."

Summary of congenital and acquired skills, prowess and knowledge disposed by workers is called human resources. OECD (1998) defines human capital as the knowledge, skills, abilities and other characteristics of humans that are relevant to economic activity. Bearer of human capital is the man - his actions, ideas and innovations.

Human resources managers are now more than ever before under pressure to show the value of human resources and their successful management tools. The main objective of the whole system of human resource management is to create the conditions for the effective implementation of business strategy built to maximize the performance of human resources. Many prominent HR Management experts (Drucker, 2004, Pfeffer, 1994 Armstrong, 2007, 2012; Bach, 2005 Rothwell - Prescott, 2012, and others) are inclining to the declaration that the technology can be bought, a new company management system can be established, financial resources can be borrowed, but it does not help the company if it has no available human capital of high quality. A. Kopčaj (2007, S.176), which deals with wealth increases, says that the source of wealth increases would be only person, motivated and incorporated into the workflow, reflecting the bounds of its motivation and producing, and by this way wins the business competition. A source of wealth is considering by a person. According to him, the money cannot be a source of wealth growth, it is just energy, and source must have the characteristics of potential success.

Following these trends J. Suchy and P. Nahlovsky (Suchy, Nahlovsky, 2012) are expanding referred theories to the aspect of the uniqueness of each employee and manager. People management cannot be decomposed to the summary of all skills and abilities, which we needing to acquire, to become competent managers. Managing people sounds nowadays impersonally. Each person has its development; it is changing in
time, tomorrow each person may react differently than today. Managing people means joining managers and workers together. From this theory, we can deduce the role of company management in bringing together business and personal goals of employees.

3. Importance of human resources development

The essential tasks of human resource management include its participation in fulfilling business objectives and implementing business strategy by the intensive performance, development and engagement support of human resources in the company. Such effective activity includes the continuous employees’ development and motivation. Corporate strategy is linked with the HR strategy based on a combination of human resources management tools. This assumes an active approach of employees to perform certain activities, their identification with the vision and strategy of the company.

Responsibility of human resources managers is a continuous detection of the steps they need to do to achieve consistently high level of employee performance. Effective human resource development consists in the use of human resource management tools in order to ensure their highest possible efficiency. This will be the main criterion for assessing success. The effectiveness of human resource development gives managers the opportunity to "sell" their work - to link the achievement of the objectives of human resource management with business objectives and measure the benefits of investment in human resources management. The effectiveness of human resources and tools becomes the object of measurement and evaluation. (Minarova M., Lara Z., 2012, p.28)

4. Evaluation of the Human Resources Development System

The aim of the human resource management in any company is to maximize return on investments in human resources and minimize the risk of the investments. HR managers facing the task to link human resources with business strategy and its requirements by the implementation of such a strategy of human resources, which respecting and supporting the business objectives that are already set-up. This needs to take into account the legal and ethical aspects and always to act pragmatically and efficiently.

Costs spent on acquiring and maintaining of employees, their motivation and creating space for personal fulfillment, regular evaluation of employee performance, ensuring customer satisfaction and retention, must be comparable with the gaining flowing from the use of these tools for human resources development. This approach to human resources development describes N. Urbancikova (2006, p. 128), as the dilemma of the view at human resource development.

The basic principle of investment decision in any business is the same. From the investment in human capital expects the enterprise, this time as an investor, return comparable or higher than the returns on alternative investments, while the revenue may
not always be expressed in money. This could include income in the form of social prestige, the image on the labor market, positive externalities (educated employees quickly transmit knowledge to their colleagues, are less subject to the negative approach from their co-workers, are more stable, they can operate more effectively, etc.).

Also in terms of the theory of human resource development the employees have status of an investment. (Bryan, L., 2007, McKinsey, 2007, Becker, G.S., 1995, Armstrong, M. 2007, etc.) The company invests in "hunting heads", motivation programs, stabilization and stimulation of employee performance and its professional personal development. (Pichna, J., 1995, p. 38) From the above mentioned it can be concluded that the same way of deciding as at investment into physical capital, can be similarly applied when we are deciding on investment in human resources:

1. Rule:                  2.Rule:                                 3.Rule:

When creating a portfolio of human resources, the managers in the role of investor considering factors as costs, risk and benefits of investment and taking into account the needs and opportunities of the enterprise. The best employee on the labor market does not mean that he/she is the most suitable for a particular enterprise. If the management of company applies this view of human resources to the use of human resources management tools, company should reach such portfolio of employees, which will meets the company strategy best.

To make decisions on investments in human capital of the company might be similar as deciding on other investments; it is appropriate to empirically determine the rate of return on investment in human capital. Quantification of return of investment rate demands the finding of an appropriate methodology.
It is difficult to quantify the qualitative essence of human capital. It is also difficult to separate the effects related to the change in human capital from the effects associated with changes in other corporate resources. Challenging element is consideration of a causal relationship between variables.

Programs designed to improve the utilization of human resources in the company are mostly directed to the modification of one or more components of company operations and the people in it. Minimal effect following set of action programs has caused demand for more complex and richer in content programs, human resource development and the overall change in work with human resources in a company. (Snyder, Raben a Farr; 1980) In this context, we would like to explain the terms system and program, and the difference between them in terms of this thesis. According to the free encyclopedia (http://sk.wikipedia.org/wiki/) the term program under the economic is a group of projects with the same area of content, production plan based on the same raw material, ie summary of inputs pursuing one goal. The same source (http://sk.wikipedia.org/wiki/) explains the term system as a unit composed of several parts between which there are links and relationships; elements and phenomena of the system and arranged set of direct or indirect relations between them. The above definitions also clear sense of this work, which is to understand the actions and projects in the field of human resources development, which do not have meant to be used alone, or affect other projects in the company, influence each other, but work together to improve business success by streamlining processes in it.

Requirements of corporate strategy on the quantity and quality of human resources, at the same time on their development and stabilization in the company are implemented through the human resources development and stabilization system, applying following processes of human resources management:

- Ways of communicating with potential candidates / job seekers on the labor market in the region,
- Selection of planning methods for setup the dynamic organizational structure,
- Methods for search and selection of human resources,
- Onboarding programs for new starters during the first months,
- Assessment of individual and collective performance of employees and their development planning,
- Regular cyclic training,
- Defining successors for key positions in the company and planning career development of potential managers and talented staff,
- Schedule periodic staff rotation,
- Exit interviews process,
- Applying compensation and benefits programs;
- Processing information and data flow about employees,
- Programs of health and safety at work,
In certain circumstances, the transformation of human resources policies due to changes in business strategy, change management and other processes.

Perspectives on measuring of human resource development systems successfulness are differing. F. Hronik (2007, p.190) says: „It is not enough that training or development program teaches ability of program graduates to transfer knowledge and skills in their own work. It is essential that this knowledge transfer to graduate has to bring value to the customer and displays in economic results of the company. Measurement the return on this investment is one of the hardest to realize.”

D. L. Kirkpatrick (1998) based his study on four levels of evaluating development programs:
1. Response: collecting feedback of participants, which assesses development program and planning actions for their improvement,
2. Learning: observing what has participants learned, and what knowledge, skills and attitudes they acquired,
3. Behavior: measured as change in behavior of participants after returning to their workplace,
4. Results: evaluating how has changed work outputs of participants after completion of the development program.

This methodology was followed by J. Phillips (2007), who had completed the above described levels of HR development programs evaluation with indicator of ROI (Return on Investments) human resources. The reason is that it is now necessary to compare implemented instruments of human resource management with the results achieved by indicators of corporate success.

In the current research literature there are identified two distinct approaches of human resources development evaluation - Kirkpatrick’s model and alternative approaches on evaluation of human resources development. There is also certain relationship between human resource development evaluations and management decision making. The four-level model is an important framework, if for nothing else, to help understand the role of evaluation and ways how to think about measurement of human resource
development. It is evident that human resource development evaluations should be aligned with organizational performance and effectiveness. Through evaluation of a human resources development is possible to understand its impact on the organization. Each action within HRD needs to be identified as a solution for certain identified gap in organization’s performance. The evaluation helps to determine the effectiveness of this action. Any research has not explicitly exploring the reasons why organizations rely primarily on reaction data and do not invest in evaluations that are providing financial impacts and returns. Furthermore, the literature is weak in its attempt to enhance our understanding of measuring human resource development actions, which is useful for organizational decision-making (Holton & Naquin, 2005; Mattson, 2003).

Intellectual capital theory (according to Urbančíková, 2006) uses financial ratios to determine the return on human capital. One of the key indicators is the difference of the market value and the book value or modern indicator:

\[
\text{Return on investment into Human Capital} = \frac{\text{Market Value}}{\text{Costs for reproducing assets}}
\]

However, it also has limited applicability due to the uncertainty in assessing the market, which can vary significantly from actual performance and results of the company (Urbančíková, 2006).

Another indicator based on the theory of human capital (Cascio, 2000) defines the period executing in the company as an indicator of accumulated skills and competencies. Executing the same position in the company is a kind of substitute for obtained specific qualifications, which includes knowledge and experience and considers wages paid to workers as expression of human capital economic value.

Wages can be, according to W.F.Cascia (2000) used to measure the return on investment in the human capital development, but only in combination with a model of economic value added, so that the interest is considered as the price of capital owed.

The issue of evaluation of company human resources development activities has engaged several experts (Fitz - Enz, 2000; Ulrich, Zenger a Smallwood, 1999; Becker, Huselid a Ulrich, 2001; Kaplan a Norton, 2007; Holton a Naquin, 2001). Unison concluded that the evaluation of programs for human resources development means the comparison the cost of staff development with the increase of business output and such assessments of corporate human resources development contributes to a better assessment of the value of other investments in human resource development. Ensure a good quality evaluation of human resource development with a subsequent recommendation of other activities can only be provided by an expert on human resource development, who also monitors the increase in employee's individual performance, company-wide performance indicators, improving efficiency and achieving a satisfactory
market share in the rapidly changing business environment. It is necessary that the evaluation of human resource development follows the trends, theory, methodology and experience and that also recommendations leads to the improvement of activities of company human resources development and design effective solutions to human resources development. (Yaminill a McLean, 2001)

In managerial deciding they proceed from characteristics of human resource development according to V J. Walton (1999), who defined „strategic human resource development as an implementation of the processes, that all individuals and teams equips skills, knowledge and abilities they need to be able to meet current and future tasks required by company” (Walton, 1999, p. 213). The aim of the process is to ensure the required level of human resources in the company, we can also consider that the cost items of the budget of human resources management as quantitative tools for human resources development of the company. Many scientists in their studies tried to quantify the rate of return of investment into the human capital development. Here, from the focus of chapter those ones with the highest explanatory power, in chronological order:

In the 1971 A. Kamiač (1971) tried to determine the influence of investments into education at the national income. When using data from the years 1954 to 1966 for the former Czechoslovakia estimated that every dollar of the cost of education will increase national income of 10.99 crowns. However, he points out that it is necessary to take into account other factors affecting the performance of the economy. N. G. Mankiw, D. Romer a D. N. Weil (1992) in the year 1992 argues that the increase in investment in human capital by 1% will increase employee performance by 0.6%. J. W. Kendrick (1994) a J. Mueller (1997) reported rate of return on investment in human capital from 11.3 to 12.5%. According to their findings at 1% annual growth in human capital, while 1% growth in physical capital increases output by 1% per year. G. M. Jenkins a R. Blundell (1999) monitors the return on investment in human capital, so that they draw the analogy the Okun's law: the increase in the proportion of employees with higher skills by 1%, annual output will increase by 0.42% to 0.63Z. Griliches (1997) a R. Blundell (1999) published that increasing education of workforce over the last 50 years in the U.S. has increased productivity by about one third.

J. Heckman v roku 1998 in his study examines the average rate of return on investment in human capital 10%. This means that a one-off investment of $ 1000 would return $ 100 annually. In further work with these calculations, as with physical capital, must take into account time until the investment is reflected in practice and rate of capital depreciation. Rate of return of 10% is the average rate. Does include investment income to people with different amount of accumulated human capital. Previous empirical studies have found that investing in people with a higher amount of accumulated human capital bring higher returns than investments in people with a lower amount. This happens probably due to the mechanism of himself boosting effect of human capital. One can also deduce from this that with increasing investment in human capital
increases the rate of return. (Heckman, 1998, p. 106) The results of these theories can be summarized in Table 2 according to the cited authors.

<table>
<thead>
<tr>
<th>Author</th>
<th>ROI (%)</th>
</tr>
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<tbody>
<tr>
<td>Mincer (1962)</td>
<td>10 – 20</td>
</tr>
<tr>
<td>Kamiač (1971)</td>
<td>10,99</td>
</tr>
<tr>
<td>Mankiw, Romer, Weil (1992)</td>
<td>6</td>
</tr>
<tr>
<td>Griliches (1997), Blundell (1999)</td>
<td>30</td>
</tr>
<tr>
<td>Heckman (1998)</td>
<td>10</td>
</tr>
<tr>
<td>Bryan (2007)</td>
<td>17</td>
</tr>
<tr>
<td>McKinsey (2005)</td>
<td>23</td>
</tr>
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</table>

In addition to these factors that affect the return on investment in human capital, it is necessary when assessing the efficiency of investment in human resources to take into account the following factors (Vodák, Kucharčíková, 2007, p.155):

- Time to reach the full return on investment. For the reason that this indicator will also affect the nature and objectives of the development program,
- not all benefits are measurable in monetary terms. There are also qualitative, non-monetary benefits. They are expressed in areas of morality, communication, teamwork, motivation, to the success of the company as important, but it is very difficult to express in monetary terms.

On the side of investment in human resources, human resources management processes, indicators are quantifiable in monetary terms, but also those which are not expressed in money. Processes, human resource development, which can not be quantified as the cost of the budget can not be compared with company success and therefore can not be recalculate the return on investment of them. In general, from intangible assets is difficult or impossible to calculate indicators to monitor trends and interdependencies. Intangible indicators are very difficult to appreciate, and to determine how they affected the fulfillment of business objectives. (Bryan, 2007, p.2) Assessment and measurement of intangible indicators is not comparable with the process of evaluation and measurement in accounting because there are no accepted standards approved.

5. Conclusion

A description of how company management communicates on the labor market with potential candidates, how plans a human resource for future periods, how evaluates employees and identifies key employees, potentials and successors, how does it motivate employees on existing key positions, what attention is paid to exit interview, in which periodicity is scheduled rotation of employees etc. will complete the results of indicators ROI correlation on the quality dimension. An important factor is the exami-
nation of the corporate culture, which is reflected in improved employee performance to meet the business strategy. That is why we suggest at once calculating ROI in human resources development actions and evaluating feedbacks from employees or key employees/talent pool employees about the influence of human resources development on the company success. Using the questionnaire or brainstorming method. Both views are the same importance and should be evaluated simultaneously on the regular basis.

7. References:

making perspective. *Human Resource Development Quarterly*, 16(2), 257-280


**Summary**

Managers nowadays are aware of the importance of human resources development and needs to measure the impact of investment into the employee development to the company success. There are various methods and measures for expressing dependence between the investment to employee development and company success. This chapter, based on various researches of authorities within the domain of human resources development professionals, is focusing on the method comparing Return on Investments into Human Resources Development programs. Kirkpatrick’s methodology was expanded by many experts in this domain, and this chapter describes also the limitations of the measurement of return on investment of human resource development initiatives or programs in providing the kind of information needed by decision makers in the company. This could be the challenge for HRD professionals, who can evaluate also qualitative data as inputs of the evaluation.
Human capital management in enterprises in knowledge based economy conditions

Joanna CZERNA-GRYGIEL *

1. Introduction

Modern economy should be described in category of global knowledge-based economy.

The knowledge-based economy is characterized as:

• service economy where majority of employees work in the service sector;
• the economy based on knowledge management what means generating, distribution and application of knowledge and information;
• the economy in which many enterprises base their competitive advantage on knowledge (Korzeniewicz, 2008, p.270)

The idea of a knowledge-based economy was created as an opposition to the industrial economy prevailing for the last centuries. Although the previous economic systems availed of the knowledge influencing the technological development, only at the turn of the 20th and 21st centuries the role of knowledge became prevailing owing to the development of information technology. One of the signs indicating how developed the knowledge-based economy has become is a relatively rapid increase of investments in research, development and education in comparison to the investments in fixed assets (Kłodziński, 2006, p.9).

The knowledge-based economy is related to information and communication technologies as well as technological development and innovation.

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The existing definitions of the knowledge-based economy are descriptive and they include the characteristics, which should be typical of a knowledge-based economy. OECD elaborated important methodic and statistic works regarding knowledge-based economy (Skrzypek; OECD, 2001). OECD defines it as an economy which is directly based on production, distribution and use of knowledge and information. Knowledge is understood here as a product and a factor influencing the economic growth. The increasing role of globalization, information technology and most of all the development of science and knowledge as the foundations of economic changes are named as the most important traits of the knowledge-based economy (Miśkow, 2014, p. 1).

KBE (Knowledge based economy) has the following conveyors: high technology industry, services of ICT, educational services.

KBE is the economy dominated by products and services which market values depend more on knowledge than on material resources (Korzeniewicz, 2008, p.270).

In Drucker’s opinion knowledge-based economy is the economic order in which the knowledge has the key-position, work, raw materials and capital are less important.

Knowledge has become the key to success of modern enterprises and it is the main source of competitive advantage. The opinion that intangible assets investment is more profitable than tangible assets investment becomes more and more common (Adamowski, Frydecka, Kiejna, 2007, p. 325).

In the knowledge-based economy there has been a change in the way market economy functions and the conditions of the flow of production factors have been modified as well. Knowledge has become a production factor of key importance. The production changes are mostly visible in the areas related to creating, processing and distributing information.

In Drucker’s opinion knowledge although not as the unique source of competition supremacy will be however the most important.

Knowledge based economy implies generating practical knowledge and switching from it into material or social benefits. Execution of these objectives requires effective knowledge and human capital management. An important task in human capital management in enterprises in knowledge-based economy is investment in education level increase and qualification growth.

For the development of the KBE the improvement of the level of education is necessary in high-developed countries, because one of the initial conditions of the KBE in Claire’s opinion is the society characterised by a high level of education in which high school education is considered as common and the higher one assumes the half of the working population.

The knowledge-based economy in the developed countries is consequently characterized with a lot of investment in human capital.

The companies that are willing to provide money for raising the level of education of their employees can expect an increase in competitiveness. Therefore, they will cre-
ate an organizational culture, which promotes gaining knowledge among the employees and, consequently, builds a knowledge based company.

The aim of the chapter is to present the research results in context of the analyzed problem.

2. Materials&methods

Execution of the aim of the chapter obliged application of the following research methods: descriptive, comparative and descriptive statistics.

Sources of information of the chapter are professional literature about knowledge based economy and human capital management.

The chapter presents research (based on a questionnaire) results on human capital development occurring in enterprises located in Wielkopolska province in Poland in May 2009. The questionnaire research contained the group 189 employee of different service, trade and production enterprises the area Wielkopolska province. All the elements of the questionnaire were presented in form of questions. This questions were contained in the questionnaire based on the bibliography on the subject. The questionnaire was divided into two part. The first one was composed of personal data. The second one contained questions with regard to the evaluation possibilities of improving qualification offered by the own abilities. To reach the most probable research result-ants it was conducted among employees of different sex, age and work stage. They had different position in the enterprises. The aim of the chapter was the establish the role of education and the sources of its financing and application of achieved knowledge and abilities in the area of human capital in the enterprises in the KBE. Numerous researches indicate the fact that the KBE depends on high qualifications and the level of education and investments in the area of human capital improve competition among enterprises. I don’t like economy.

The chapter presents results of researches conducted among 54 university students of Adam Mickiewicz in Poznań/Poland in March 2014 as well. The research referred to their opinion on human capital management. The method of collecting materials for this chapter was PAPI – Paper And Pencil Interviewing.

3. Research results and discussion

3.1 Human capital management in enterprises

The knowledge pillars in enterprises of the knowledge-based economy are human capital and human capital management on the level of organization.

Basic definition of human capital can be written as function of education, experience and abilities, approach to work and organization of work (Koc, 2014, p. 33).

Human capital, as proposed by Warschat, J., Wagner, K., Hauss, I. there is: competences, attitudes, leadership and development (Warschat, Wagner, Hauss, 1999).
Peter Drucker, a prominent theoretician, added one more task to the four classic management tasks: planning, organizing, motivating and control. This additional task is human development. It should be gaining more and more importance as investment in human capital is becoming the main priority for many companies.

The main condition for effective management of human resources is therefore a proper education system as well as a good system of gaining qualifications and on-job trainings in the economic initiative system.

Increasing the level of education equally pertains to employees and employers. They should be prepared to manage the company, especially human resources and so different forms of education must be developed.

One practical examples of improvement of management abilities is the program of training called “Outstanding Manager”. The workshop took the form of lectures and a seminar discussion conducted by coach and moderator as one person. The project is aimed at educating of managers and improvement of human resources management abilities in a modern enterprise in the knowledge-based economy. In opinion of Lao-tse, a famous ancient Chinese philosopher, the best managers are invisible meaning that people are convinced they do their work by themselves.

Poznań University of Technology in turn, taking care for future managers, executes two projects “Engineer’s era” and “Engineer of the future”. Students are proposed to have wide themes trainings like: time management, presentation skills, PR creation and savoir vivre. Students are also made conscious of continuous learning and improvement need, also in interpersonal abilities.

Experts point out, missing foreign language knowledge can become a serious barrier for a manager. Katarzyna Kordoń, president of K&K Select Personal Consulting Center remarks that 90% of foreign clients of her company requires English skills from candidates. Students of Production Management and Engineering in Poznań University of Technology have two courses – soft skills in English and advanced AutoCAD. The skills achieved are used by them among others when writing motivation letters to foreign employers (De Graff, Kolmos, 2014).

An organization’s knowledge resources are its intellectual assets, which are a sum of each employee’s knowledge used by the organization in its endeavours. Employees who can avail of their knowledge to lower the costs and increase the company’s value are the key link in its knowledge resources (Adamowski, Frydecka, Kiejna, 2007, p. 319).

The new social division of tasks faces a challenge of how to increase the productivity of knowledge, especially when the productivity of investment in the physical capital is falling and the productivity of investment in human capital is growing.

According to Tomasz Szpikowski, president of Bergman Engineering, during studies there should be taught, apart from standard education aspects, such subjects, like: presentation skills, team work, team management, reporting and motivating - related to human capital management.
Millward Brown SMG/KRC researches prove, that soft skills like communication, team work ability, team management consist a development potential of managers. According to employers, ability to work in a team, to co-work and to learn are basic attributes of management (De Graff, Kolmos, 2014).

In March 2014 in Poznań (Poland) researches conducted among students having professional experience (they work both). The interviews were first of all on their opinion on expectations and applications of subjects and cases analyzed at University.

In students’ opinion, future managers need:
- Trainings and lectures on negotiation techniques and skills based on management psychology and sociology;
- Trainings in skillful use of computer programs – especially calculation spreadsheets;
- Lectures and workshops on safety and hygiene at work;
- Legal aspects of employments and work lectures.

Apart from above, students have remarked the need of much higher level of foreign languages educations in comparison to present one.

It was highly pointed out that practical knowledge absorbed at the University for instance in the form of case studies could respectively prepare future managers to their managerial roles and would allow to apply theoretical knowledge in business reality.

Researches contain also a question on knowledge and skills, which should be an attribute of human resources manager.

Students were unanimous with respect to following skills:

- Capability to use knowledge, know how and experience of employees to increase the competitiveness of enterprise
- Negotiations and dispute extinguishing skills
- Planning and tasks/work division among employees and engaging them
- Rewarding employees and their knowledge
- Employing people according to their competences
- Awareness of employees education needs and sending them trainings

The human capital manager should also have experience in team work and also he/she should follow the rules for work and safety legal regulations.

According to the students, a manager in knowledge based economy epoch should have not only University education, and fluent knowledge of foreign languages (best two), but also participation in courses, workshops and trainings, and he/she should have ability to use in led company scientific achievements and apply there the innovations and new technologies.

Research conducted among students in Poznań/Poland indicate that too much theoretical and too little practical knowledge is taught. Practical knowledge taught at higher school should have form at teaching based on concrete examples and solutions taken from practical economy - mainly economic activity of enterprises in KBE. Such form
of teaching students require adequate preparation of academic teachers and a new look at teaching of future manager and their development.

Many researches highlight that in different areas the majority of the knowledge learned by students at universities is not actual by the time the enter practice. The scores of these researches resulted in recent and worldwide growth of attention for implementing innovative solutions in higher education (De Graff, 2013, p. 380-384), specially on the engineering study (De Graf, Kolmos, 2014, p. 565-571) and medical study (Adamowski, Frydecka, Kiejna, 2006, p. 373–378; 2, p. 163–169).

3.2 Education in enterprises

Education is an important indicator of human capital. It is correlated with the economic growth, because it needs a lot of investment. This interdependence is based on creating working conditions for educated people through the development of knowledge-absorbing economic directions (Warschat, Wagner, Haus, 1999, p. 44).

The development of modern technology operated by highly-qualified employees brings about a demand for people with a high level and quality of education, who are employed in services involving science and technology development, and information flow.

When employees are performing their duties, the companies are planning to develop human capital. They evaluate the results of work and take into consideration an individual’s strategic actions. These actions can make the company evolve into a knowledge based one. A knowledge based organization comprises of people who work on gaining the proper knowledge at every level, in groups and individually. An organization gives its employees full freedom to act as they wish within their powers and with a minimum control of other people. Trust in the employees’ abilities, their eagerness to cooperate, to introduce new solutions and innovation and to be creative when coping with problems is an important element of such enterprise.

CEMEX Poland became a Winner in the competition “Leader of Human Resources Management” in 2013. The reward was given for modern education programs. Kamila Skorupińska, human resources and organization manager plus member of the board of directors in CEMEX are convinced, the jury took into account the education approach and employee development aspects. Education programs use wide variety of training methods. Usually it’s e-learning related to workshops and conceptual work over projects. Most of trainings start with e-learning, being a source of theoretic knowledge to the employee in his convenient time. E-learning programs are ended with tests. Workshops are done inter-actively with coaches as exercises, praxis, discussions and problem solving. In education program, the employee needs to do projects and tasks. It enables him to benefit from the knowledge later on in his working environment, where the trainings results in aimed effects. Only when the employee is capable to use practically the learned skills it can be treated as really developing.
The development of human capital comes from the opportunity to gain more knowledge, practical skills and increase qualifications. The results of empirical studies conducted in some companies in a Polish province Wielkopolskie in May 2009 indicate that the role of higher education is gaining more and more importance among those who have started working (Figure 1).
However, it turns out that while employees are eager to increase their education level, their employers are not eager to provide them financial help (Figure 2).

The support to escalate the employees’ education level is regarded by employers as useless for their companies and education is treated as a private matter of the employee.

A strong need to gain knowledge among the employees makes them more prone to pay for their studies themselves and therefore to achieve self-actualization, define career paths and search for better jobs, including those abroad (Figure 3).

Fig. 8. Perspectives of better use of gained skills, experience and knowledge in the place of work

Only few employers see the trend to increase education level of employees as important. However it might be a crucial factor tying employees to the company, taking into consideration the perspective of their emigration, internal migrations and employee fluctuation. The companies that are willing to provide money for raising education level of their employees can expect the increase in competitiveness. Therefore, they will create an organizational culture, which promotes gaining knowledge and consequently, builds a knowledge based company.

4. Conclusions

Presently, when most of projects require a multi-functional team engagement, soft skills learned at Universities, especially at management and economics studies, should contribute to higher professional success at graduates’ future careers as human capital managers in enterprises.

Research seems to prove that effective human capital management in enterprises in knowledge based economy conditions depends on human factor development. Education is an important indicator of human capital development. The first step on that way
is the implementation of innovative forms of teaching based on Problem Based Learning (PBL) method.

The knowledge-based economy demands a constant rise of the level of education and acquisition of new qualifications because investment in the development of human capital may be an important tool in increasing a company’s competitiveness. The human development in the knowledge based company has made it possible to invest, especially in the state-of-the-art technology.

5. References:

Summary

Human capital management in enterprises in knowledge based economy conditions is the subject of this work. The aim of this chapter is presentation of the research results in context of the analyzed research problem. This chapter aim execution required application of the following research methods: descriptive, comparative and descriptive statistics in form of phenomena structure analysis. Professional literature on knowledge based economy and human capital management is the source of information in the chapter.

The chapter presents research (based on a questionnaire) results on human capital development occurring in enterprises located in Wielkopolska province in Poland in May 2009.

The chapter presents results of researches conducted among 54 university students of Adam Mickiewicz in Poznań/Poland in March 2014 as well. The research referred to their opinion on human capital management. The method of collecting materials for this chapter was PAPI – Paper And Pencil Interviewing.

Main results:

Human capital management in enterprises in the knowledge based economy conditions depends on human factor development, especially on level of education, skills, experience and practice. During studies about management there should be taught, apart from standard education aspects, soft skills, such subjects, like: time management, presentation skills, PR creation, trainings and lectures on negotiation techniques and skills based on management psychology and sociology.

The world is still facing a few problems regarding the abilities to use human capital. There is a low level of English language education, the use of advanced information technology and obsolescent form of teaching.

Researches contain also a question on knowledge and skills, which should be an attribute of human resources manager: capability to use knowledge, know how and experience of employees to increase the competitiveness of enterprise; negotiations and dispute extinguishing skills; planning and tasks/work division among employees and engaging them; rewarding employees and their knowledge; employing people according to their competences; awareness of employees education needs and sending them trainings.

The results of research conducted in some companies in a Polish province Wielkopolskie in May 2009 indicate that an important task in human capital management in enterprises in knowledge based economy is investment in education level increase and qualification growth.

Research conducted among students in Poznań/Poland indicate that too much theoretical and too little practical knowledge is taught. Practical knowledge taught at higher school should have form at teaching based on concrete examples and solutions taken from practical economy - mainly economic activity of enterprises in KBE. Such form of teaching students require adequate preparation of academic teachers and a new look at teaching of future manager and their development.

The development of human capital in the KBE is a challenge not only for students as the future managers but first of all for academic teachers (implementation of PBL) and managers being presently at boards of enterprises.
CHAPTER 8

Environmental aspects of entrepreneurship - necessity in business education
Hanna KRUK *

1. Introduction

The awareness of the fact that proper, rational management of the natural resources accompanied by the necessity to take care of the environment are conditions contributing to permanent economic development and improving the quality of life is growing. Contemporary questions connected with environmental protection and the so-called “greening” of the economy is more and more frequently included in the national law of developed countries and – moreover – they should be also taken into consideration during enterprises’ activities. Such a state stems from spreading the idea of the sustainable development and more frequent implementation of its principles in strategic documents or in domestic and international legislation. In spite of the fact that sustainable development concerns three dimensions: economic, social and ecological, only two of them are mentioned in the following chapter: the relationship between economy and environment. These interactions between natural values and resources and their influence on possibility of conducting economic activity in different branches, as well as an effect of economic activity on environmental state have been already identified [i.e. Kistowski, Staszek, 1999, p. 97; Madej 2002, p. 85-87]. However, knowledge in this topic and familiarisation with legal regulations are not commonly transmitted during university studies during management or economics fields.

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This chapter is an attempt to review study programmes in randomly selected public universities and technical universities across Poland, in order to check whether the topics connected with environment protection, the use of natural resources and sustainable development are included and, if that is the case, what their ranges are. Curricula have been analysed in two fields of studies: economics and management, both regarding I (bachelor) and II (master) degree of studies.

2. **Principles of sustainable development and enterprises’ activities**

The knowledge about foundations of sustainable development and ability to use them for improving economic activity is important for businesses operating in developed countries (i.e. European Union), where environmental law is strict and consumers, while making their decisions, take into considerations not only product prices but also their “environmental friendliness”.

Implementation of sustainable development in economic practice is related to several principles that should be observed by enterprises. The following cardinal ones could be distinguished [Borys, Śleszyński 1999, p. 84-91]:

1. principle of ecologisation – it is assumed that environmental protection is indispensable to perform proper economy; moreover, economic activity must be adjusted to natural conditions and the use of natural resources should be reasonable and effective as well as ought to take the needs of future generations into consideration,

2. principle of environmental integrity – there are many interactions among components of the environment; knowledge about them and their respecting allows to restrain negative effect that economy has over nature; the necessity to estimate and assess natural resources and values as well as full balancing of economic effects (benefits and costs) seems to be indispensable as well,

3. principle of social participation – local societies and non-governmental organisations should be involved in environmental protection; also, they have the right to be informed about environmental state,

4. principle of economisation – achieving ecological aims (related to nature protection and preservation of the environment) should be linked to the smallest social cost; that means, for instance, the use of market mechanisms but also includes fundamental interference of authorities (i.e. market does not take into external costs into account); the principle is also joined with others: “the author of the damage (pollutions) pays”, “the user pays” and the rule of “joint responsibility”,

5. prevention (active ecological policy) – prevention of environmental damages owing to implementation of new technologies which allow to avoid pollutions, their neutralisation and recycling,

6. principle of lawfulness – all agents (individuals, authorities and enterprises) should respect the law.
Other principles connected with the above-mentioned issues also may be cited, for instance: the necessity of land reclamation after finishing the activity or compulsory licensing of selected natural resources exploitation being among such ones [Borys, Śleszyński 1999, p. 84, 91].

Enterprise operation should be performed in compliance with the aforementioned principles. It is also worth mentioning that environmental law in developed countries is becoming stricter and all business entities must obey it. Apart from adapting their activity to obligatory regulations, enterprises also conduct voluntary actions resulting in improving environmental state or the quality of life (social welfare). There are usually actions taken within the limits of corporate social responsibility (CSR) or implementation of environmental management systems, including ecological certification.

Review of the above-mentioned principles allows to prepare a short list of essential knowledge for the managers and the individuals managing their own business. There are several issues related to greening the economy, namely: jurisprudence (especially environmental regulations, for instance: conditions of license granting for exploitation of resources, license for pollution emissions, noise, water usage, waste storing etc.), product standards, implementations of environmental management systems (or, for micro- and small enterprises: knowledge about possible low-energy and raw material saving solutions), at least basic knowledge about relationship in ecosystems, methods of estimation and economic evaluation of environment and natural resources, cognizance of environmental impact assessment procedure, possibility of financing ecological solutions and innovations from external sources, CSR strategies etc. Relatively few universities pass such working knowledge to the students during economics or management fields of study.

3. Effects of pro-ecological solutions at the enterprises’ level

Enterprises have several opportunities for actions resulting in a more effective use of natural resources and improving the state of the environment. Some authors believe that such activity influences enhanced enterprises’ competitiveness [Porter, van der Linde 1995, p. 120-122, 129, 133-134].

Several benefits from ecological modernisations in firms may be listed, namely [Elliott, 2013, p. 49-50; Ejdys 2007, p. 294-295; Porter, van der Linde 1995, s. 120,126]:
1. compliance of economic activities with applicable environmental law,
2. improvement of the product quality and their safety enhancement with simultaneous production costs’ decrease,
3. heightened effectiveness of resource usage during production process (including their re-use and recycling), energy use reduction,
4. improved utilisation of by-products,
5. limitation of negative environmental impact (and, ultimately, improving the standard of living), 
6. creation of customers’ ecological awareness, development of “green” consumption and less harmful adverse environmental effect, 
7. improving the image of the enterprise and confidence boost, 
8. integrated policy during preparation of new products (services), taking into account product and resources’ recycling, their processing or re-use and the entire product life cycle (cradle-to-grave analysis) as well as implementation of environmental management systems, 
9. reduction of costs related to ecological duty (or fine) or diminution of insurance premium (lessened ecological risk), 
10. possibility of preferential financing for pro-ecological investments (funds from EU and domestic institutions like the National or the Voivodeship Funds for Environmental Protection and Water Management).

The aforementioned actions may consist in: introduction of environmental management systems (ISO 14001, EMAS) or plainly initiation of cost-effective management of energy and resources (in case of some micro- and small enterprises the cost of dedicated systems’ implementations could be too high compared to the outcomes), recycling and resources’ re-use, waste segregation and utilisation, implementation eco-certification system (typical for particular economy branch), using services from suppliers providing certified products or services, introduction of eco-innovations. Some of these may result from environmental law (and the necessity to adapt the operation to valid regulations) while others, voluntary ones, relate to CSR.

Enterprises’ owners and managers should have at least elementary knowledge regarding the principles of the sustainable development, ecological aspects of economic activity (and its impact) or pro-ecological solutions, also because one should pay attention to the fact that implementation of such aspects into business practice affects cost reduction and improves effectiveness.

4. Method

In order to identify contents concerning environmental aspects of economic activity, sustainable development and “greening” the economy, lectured at public universities in Poland, an analysis of study syllabuses at two fields, economics and management, was prepared. The review was prepared for randomly selected universities and technical universities. The relevant data were acquired from universities’ web pages. It must be mentioned that not all universities published the descriptions of the syllabuses in Internet (some of them were available only in Intranet, for registered users). Such universities were disregarded. Results of the review are not fully comparable: some universities published course for different years: predominantly for 2013/2014, but some for
2014/2015 while some for previous years only (i.e. 2012/2013). However, in the last case, the courses were running in consecutive year (or years) without changes.

As far as economics is concerned, curricula of studies were surveyed at the following universities: Cracow University of Economics, Wroclaw University of Economics, Opole University, University of Gdansk, Nicolaus Copernicus University in Torun, University of Warsaw, University of Zielona Gora, University of Lodz, University of Szczecin (Faculty of Economics and Management), Maria Curie-Sklodowska University in Lublin, University of Warmia and Mazury in Olsztyn, Kazimierz Pulaski University of Technology and Humanities in Radom and Koszalin University of Technology.

As for management, the study programmes were surveyed at following universities: Cracow University of Economics, Wroclaw University of Economics, Opole University, University of Gdansk, Nicolaus Copernicus University in Torun, University of Warsaw, University of Zielona Gora, University of Lodz, University of Szczecin (Faculty of Economics and Management), Maria Curie-Sklodowska University in Lublin, University of Warmia and Mazury in Olsztyn, Koszalin University of Technology, Gdansk University of Technology, Rzeszow University of Technology, Wroclaw University of Technology, Lublin University of Technology and Bialystok University of Technology.

As a rule, economics studies are relatively seldom at technical universities. Moreover, in case of management, at I degree of studies, there could be two parallel courses: typical bachelor degree and engineer degree.

The review of study programmes was prepared including division into studies of I (bachelor’s) and II (master’s) degree and partition between courses in major area (basic) and specialty courses.

5. Examples of including environmental aspects into the syllabuses at Polish universities

The study programmes usually encompass separate modules concerning sustainable development or questions connected with environment’s preservation or protection. These modules are quite frequently classified as specialty courses (and not always are mandatory) not as the major ones. The most frequently mentioned modules or lectures have been presented in Table 1. Because the titles of modules differ depending on universities, the most common names have been used.
### Table 1. Modules most frequently included in particular fields and specialities

<table>
<thead>
<tr>
<th>Module</th>
<th>Number of specialties</th>
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<tbody>
<tr>
<td></td>
<td>field: economics</td>
<td>field: management</td>
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<tr>
<td></td>
<td>I degree study</td>
<td>II degree study</td>
<td>I degree study</td>
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<tr>
<td>Corporate Social Responsibility (CSR)</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Ecology of natural resources and environment protection</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Economy and environment</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Sustainable development</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Environmental management</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Source: own

In case of CSR all modules connected with this subject were included, although they were named differently, for instance: “CSR strategy”, “Social responsibility in public administration and business”, “Social responsibility in business” “Social responsibility in urban areas management” etc. In general, the subject name was related to the study specialty. In field: economics, CSR module was always at specialty course, however in 2 cases this module was optional. Whereas, in the field of management, in one case (University of Warsaw) CSR was classified as a major area.

As for the module “Ecology of natural resources and protection of the environment”, the differences in the title were major and sometimes included only one part of the subject: from “Protection of the environment” or “Basis of environmental protection”, through “Economics of environment”, “Basis of environment economics and natural resources” or “Economics of natural resources” to “Economics (or ecology) of natural resources and environmental protection”. In three universities this module was in major area: at University of Gdansk, Bialystok University of Technology (field: management in both cases) and at Wroclaw University of Economics (field: economics). It may be assumed that authors of study curriculums decided that the module had primary importance for the I degree studies.

Another previously mentioned module, quite similar to the previous one, is “Economy and environment” (the title was identical at different universities). This module is generally listed in the group of major area lectures/modules, but in one case, at II degree of study (Koszalin University of Technology) is elective at every specialty.

Next module, concerning sustainable development (in general or with reference to cities, local or regional level – depending on specialty) is more frequently incorporated
in programmes in economics field than in management. This module is always placed during specialty courses (in two cases – optional ones).

On the contrary, systems of environmental management are mainly lectured during management study (however the name of this subject may differ for various universities). At two of them the module is incorporated into the courses in major area (at Białystok University of Technology it is “Environmental management” and at Lublin University of Technology “Ecology and environmental management”).

The relevant curricula also cover other modules connected with ecological aspects of economy or management. For example, as far as economics is concerned, they include:

1) at Wrocław University of Economics:
   - “Market in environmental protection” and “Market of the ecological products” – for the specialty: Market Analyst,
   - “Energy management” – for the specialty: Public Economy

2) at Opole University between major courses there is also “Nature philosophy / Philosophy” and for the specialty Management of the Urban and Regional Economy there are two modules: “Environmental management in local government units” and the above-mentioned “Social responsibility in urban areas’ management” (both optional),

3) at University of Zielona Gora among other modules to be selected from, there are “Basis of environmental economics” and “Ecological assessment of the products”.

For the study field of management, at different universities, with the course structure, except for the above-mentioned one, there exist the following specialty modules:

1) at Cracow University of Economics there is “Eco-management” course as a part of specialty Functioning and Development of Enterprises,

2) at Wrocław University of Economics, specialty: Social Responsible Business, except for the above-mentioned “CSR strategy” there is also course named “Ecological marketing”,

3) at University of Warsaw, a module “Ecological determinants of enterprise management” is a part of specialty Management of the Organisation course,

4) at University of Zielona Gora – some optional modules are available, for instance: “Management of the environment”, “Cleaner production strategy”, “Ecological innovations in enterprise”, “Ecological assessment of products” and others,

5) at University of Szczecin (Faculty of Economics and Management) there is “Environmental impact in EU Projects” module for the specialty: Management of the EU Projects,

6) and at University of Gdansk I degree students attend “Global ecological challenges” module.

It is also worth mentioning that, as a rule, in case of one field (economics or management) there are a few specialties concerning different aspect of enterprises’ man-
agement but not all of them include environmental questions. For example, at Rzeszow University of Technology module “CSR” is a part of the syllabus for the specialty Professional Manager programme, but not for the specialty of Firm Management. The last one mentioned course programme has no module connected with environmental aspects of economic activity.

It is also probable that some topics related to “green” economics are taken into account in other modules, for instance eco-innovations might be examined in the modules devoted to innovations in general.

In order to summarise this review, it is obvious that modules considering environmental aspects are mainly a part of specialty courses. Some of them include only general questions but others show practical solutions and examples. However, not all interactions between enterprises and environment are taught as well as not all practical aspects of enterprises’ economic activities are related to the use of the environment.

Some universities deliver new specialties considering management or economy of the environment and its resources.

6. Examples of pro-environmental studies at Polish universities in the departments of economics and management

A few universities started new specialties connecting economic or management questions with environmental ones. In others, new fields of study have been introduced.

In case of new specialties, their programmes vary: there are universities where all specialty courses are strictly related to environmental questions, but at others – the more general subjects are included.

Specialty of Management of Environmental Resources (I and II degree studies) run at Wroclaw University of Economics (Field of study: economics) may serve as a benchmark here. All academic courses are strictly related to economy and management of natural resources and contain all possible aspects of economic activity: from the basics of ecology, through legal regulations, ecological instruments, various questions of environmental management and its protection (including sources of financing, eco-marketing, use and management of energy, water, sewage and wastes) to ecology of products, accountancy and ecological controlling as well as international aspects of nature and environment protection.

At University of Lodz there is another specialty: Eco-business (study field: economics, I and II degree studies). The spectrum of other specialty courses also includes: “Waste and water-sewage management”, “Policy of environment protection”, “Sustainable development”, “Ecological-economic models”, “Environmental law”, “International co-operation in environment protection, institutional aspects”, (at I degree) “Economics of renewable energy sources’ use”, “Labour market and green work-
H. Kruk

places”, “Fuel and energy management” and “Sustainable transport, tourism and agriculture”.

In the field of economics as well, at University of Szczecin (Faculty of Economics and Management) at II degree of studies the following specialty is available: Economics of Environment Protection and Urban Economy. The study curriculum contains the following modules: “Environment protection and management in local government units (LGU)”. “Ecological investment in LGU”, “Urban economy”, “Wastes and hazardous substances’ management”. However, this specialty is not strictly related to enterprises, but rather to local and regional levels.

On the contrary, at University of Gdansk, there is (in study field: management) a specialty called Management of Quality and Environment (I degree study) but in a curriculum structure there are only courses connected with the environment, for instance: “CSR”, “Sustainable development”, “Financing of the sustainable development”, “Basis of environmental protection” and “Auditor ISO 9001”.

University of Gdansk also offers a new field of study: Business and ecological technology (II degree of study). The programme structure includes such modules, as: “Green technologies”, “Management of the ecological projects”, “Renewable energy”, “Ecological business planning”, “Environmental monitoring in enterprises” etc. The only module not related directly to environmental aspects of economic activity is “Managerial economics”.

As far as universities of technology (in Bialystok and Lublin) are concerned, a new field of studies was prepared: Management and Production Engineering, with courses including some ecological aspects of economic activity (such topics like: “Ecology of natural resources and environment protection”). Comparing these two study programmes, ecological and environmental question are presented in a wider way at University of Technology in Bialystok (there are the following modules” “Environmental management”, “Economic analysis in management of environment” etc.).

It seems that new pro-ecological fields of studies are growing in the offers that are provided by the university

7. Conclusions

Environmental aspects of economic activity are more often included in the structure of the economic and management studies. However, this conclusion does not refer to all universities. There exist academic centres which study programmes do not offer any course regarding environment whatsoever. In case of others – some topics are included but at selected specialties only. In some universities modules referring to environmental questions are mandatory, while in others they remain optional.

The most popular modules at Polish universities are CSR, sustainable development, protection of the environment (sometimes together with the use of natural resources or
Environmental aspects of entrepreneurship – necessity in business education

its ecological foundations) and environmental management. However, they are usually classified as specialty courses, not the major area.

The number of specialties devoted to environmental questions is growing. However, it must be mentioned that in the majority of universities such knowledge is lectured in specialty subjects and they are usually limited to one or two general courses.

It is also worth mentioning that new fields of studies, fully (or almost entirely) devoted to environmental aspects of economic activity have been created (like Management and Production Engineering, Management of Environmental Resources or Eco-business). Consequently to that, the ecological awareness in the society, knowledge of pro-ecological solutions and skills of their implementation into everyday enterprises’ activity are also increasing, which may lead to further improvement of eco-innovativeness level and the environment state in the future. The final result of these actions will be “green”, sustainable economic growth of Polish economy.

9. References:

Summary
According to the principles of the European Union, the topic of sustainable development is strongly emphasized. The environmental law is becoming stricter, which means new questions and challenges for enterprises comprising: eco-innovations, eco-certifications, implementing ISO and EMAS systems, renewable energy sources, natural resources estimation, environmental impact assessment, water, energy and waste management, restriction related to various protected area etc. Therefore, all of the above-mentioned environmental aspect of economic activities should be known to managers and businessmen. The following chapter is an attempt to identify the most frequently lectured modules devoted to these topics that are incorporated in management and economics studies at randomly selected Polish universities (9 universities, 7
universities of technology and 2 universities of economics). It also presents examples of studies in Poland including such subjects. Generally speaking, many study curricula at universities include courses concerning environmental aspects of enterprises’ activity but they are mostly general in character (sometimes only optional) and not all important contents (from managers’ or owners’ points of view) are available. Such modules are often accessible at selected specialities. The situation is constantly improving – more and more universities have such lectures or modules on their offer or sometimes they even prepare the whole specialties related to environmental aspects of management or economics. However in spite of ameliorating the situation, changes made in study programmes seem to be quite insufficient and some other actions are needed to widen ecological awareness of future businesspeople and managers.
Science and business cooperation on innovation – evidence from Pomerania
Sylwia BADOWSKA *

1. Introduction

According to the European Scoreboard 2013, Poland took the 4th place at the end of innovation. The low score in the ranking dictated by the multiannual low expenditure on R & D, but also insufficient competence of enterprises in designing and implementing innovation. In the knowledge-based economy, innovation is a new engine of companies’ growth. Creating a broadly defined innovation is highly desirable, although extremely difficult and characterized by a high risk of a failure. One of innovation pillars is an availability of an acquisition of appropriate resources. In this case, the key to success is a properly prepared own organization of human capital and companies’ ability to absorb specific knowledge needed in innovation processes. If a company is not ready for generating new knowledge itself, it should be open for searching partners outside who are able to bring new knowledge to the organization. One of these partners could be found in the regional or national system of innovation, mainly among universities and R&D institutions. A regional innovation system plays an extremely important role in the innovation process, in which universities are acting as the first generators of new knowledge which is necessary for innovation in enterprises. Moreover they prepare skilled employees for industry. Universities are a kind of a conveyor belt of new knowledge and skills to business.

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The effectiveness of filling these roles by universities is dictated by a level of new knowledge and practical competence of these units’ academic staff. Personal contacts academics with business, practical experience of researchers in collaboration with industry, as well as openness to the applicability results of their research in practice are the elements of supporting pro-innovation activities in the regional innovation system. The chapter sheds light on the role of universities in Poland in the aspect of the “third mission”, the complex nature of the relationship between the university and industry, firmly established a connection between business and science and capacity for mutual cooperation from the academia’s perspective.

2. Aim, applied research methods, sources of data and information

The aim of this chapter is to present a role of universities and R&D institutions in Pomeranian system of innovation. The researcher expected to firmly establish and briefly examine the connections between academia and business in the aspect of innovation. The subject of the study was to assess the level and intensity of cooperation between universities and R & D units with local businesses to strengthen innovation processes in companies of regional system of innovation. The survey should show the answers for following questions: What does the cooperation between science and business look like at regional system of innovation? What is the role of regional universities and R&D institutions in the process of knowledge creation used for innovation (mainly product innovation)? Does the cooperation affect innovation for local companies? This chapter is based on original survey data collected from Pomerania universities and R&D institution in 2010.

2.1 Theoretical background

Innovation is the most important factor to survive „hypercompetition” (Porter,1996) which has been taking place for the last 20 years up to now. Innovation is associated with an application of new knowledge. In broad terms, innovation refers to the creation of new products, services processes and organizational methods or adaptations of those that exist, based on new knowledge (Wolf, 2006). Innovation is presumed to derive from a network of interaction and collaboration between actors in a social system. The stronger the linkages and social relationships between the actors in the system, the higher probability the innovation will occur (Yokakul & Zawdie, 2011). University-industry links have generated a great deal of academic discussion and policy research for some time now (Torres, et al 2001). At the beginning the traditional task of academia was only teaching. The first revolution which broadened the role of university took place in the late 19th century made research a additional duty to teaching. At the turn of the 20th and 21st century, the new approach called “university third mission” associated with economic and social development emerged as a new additional task for academia.
With this approach, research findings should be translated into marketable commodities. (Etzkowitz, 2003, 2008, Etzkowitz & Webster, 1998, Laredo, 2007, Villasana, 2011). The “third mission” has been embedded in the concept of innovation system (SI). The idea of SI proposed and developed by Edquist (2001) is understood as a mechanism of interaction between organizations for exchanging knowledge and collaborating with a view to promoting innovation. It has been successfully applied to the investigation of innovation activity mainly at the national level, and such studies have shown that a nation’s capacity of innovation is determined not only by simple summation of individual firms’ capabilities but also by all linkages available (Lee & Park, 2005). The performance of an innovation system increasingly depends on the intensity and effectiveness of the interactions between the main actors involved in the generation and diffusion of knowledge (OECD, 2002). From the theoretical perspective the linkages between these actors: companies, organizations and knowledge creation institutions have been under consideration in the contest of three different conceptual frameworks: “regional or national system of innovation” (Freeman, 1995; Lundvall, 1992; Cooke, 2001), “triple helix model” (Etzkowitz & Leydesdorff, 2000) and “national innovative capacity” (Furman, et al, 2002). The role of academia as a key recourse of knowledge production and input to innovation is highly expressed in all these frameworks. Comparing the academia’s role in these three frameworks researchers put different accent in all these approaches. Conducting both basic and applied research with emphasis on the former, educating and training students thus raising stock of human capital in economy as well as taking a direct role in innovation process by being an originator of new ideas and products through research are characteristic for national system of innovation. Becoming more entrepreneurial by developing greater links with its economic and social environment, engaging in patenting, licensing, business incubating and developing university spin-offs and assuming an active role in knowledge creation, diffusing and commercialization are the key tasks for universities in the triple helix approach. In “national innovative capacity” concept, academia focuses on educating and training workforce thus raising stock of human capital and training scientists and engineers who form core which ultimately produces flow of new ideas in economy (Datta & Saad, 2011).

The pursuit of relationship in the SI poses challenges for universities especially in developing countries in terms of changes to their traditional missions; the balance between research and teaching; and their response to social and economic development needs (Kruss, 2012). The new tasks for academia are much more important in developing countries than in developed ones and they are defined also by local terms including solving problems of poverty, agriculture productivity (Conway & Waage, 2010), developing a stronger science base in the region, building bridge institution between academia and industry (Villasana, 2011), supporting networking awareness and social capital building necessary to catalyze clusters (Tiffin & Kunc, 2011).
3. Research results

3.1 Methodology

The aim of this chapter is to diagnose a role of universities and R&D institutions in Pomeranian system of innovation. It required assessing a level and intensity of cooperation between universities and R & D units with local businesses to strengthen innovation processes in industry. This chapter is based on original survey data collected from Pomerania universities and R&D institutions in 2010. The purpose of the study was to explore:

• current role of universities in the regional system of innovation
• types of work carried out by the R&D institutions
• sources of research funding
• sources of academic staff’s inspiration and motivators in carrying out studies
• research utility for knowledge and innovation absorption for companies
• researcher’s experience in cooperation with business
• barriers of running cooperation between business and science in the aspect of innovation

The investigation process included preparation of studies; collection and verification of collected data; analyzing the collected material; interpretation of research results and findings; drawing conclusions from research process. The survey process consisted of two phases: quantitative and qualitative. The quantitative test was conducted using computer-assisted internet interviews (CAWI). A 35 questions query designed by a researcher was used and consisted of four thematic chapters: a characteristic of research subject, a sort of studies conducted by unit, present cooperation with business, potential cooperation with business partners. A set of questions representing measurable variables was created on the basis on review of relevant literature and the feedback from preliminary study of innovation in Poland. Questionnaires were administered to a sample of 40 scientists and academic staff who were responsible for delivering lectures to students and conducting their own scientific research work. The response rate (50% of the sample population covered) generated sample data from 20 academic teachers and scientists. The sector had been chosen because of its significant role in Pomerania economy. The questionnaires were distributed among scientists who worked for Gdansk University of Technology (GUT), University of Gdansk (UG), Gdansk Medical University (GMU), Maritime Academy (MA), the Sea Fishery Institute (SFI). In-depth interviews (IDI) with 3 academic staff representatives (SFI & GUT) were conducted as well. A five-partial thematic scenario was used during IDIs to reach the aim of the survey. The qualitative part of study was carried out only with academics whose findings of scientific research would have been used for a food processing sector.
4. Results and discussion

The first area of the research was to explore a role of universities and R & D units in the regional system of innovation and to specify the types of research conducted by Pomeranian scientists which could have been used for innovation.

Fig. 1. The role of universities and R&D units for businesses in the scientists’ opinions

As the survey showed (fig.1) 60% of respondents felt that universities and R&D units played a crucial role in education and teaching as well as conducting applied research for the industry. 25% of respondents expressed opinions that universities and R&D units offered teaching and research work only for their own needs. 10% of respondents believed that the role of these institutions was education and teaching and only preparing students for their future professional careers. Most of Pomeranian scientists were convinced that their institution should have been fulfilling the “university third mission”. The strong belief was observed generally among academic staff of Gdansk University of Technology and the SeaFisheries Institute which had been established not only for teaching by also for conducting applicable research and implementation work.

Fig. 2. Types of research conducted at universities and R&D units in the scientists’ opinions

The next step of the survey was to clearly identify sorts of research at regional academia. Basing on the outcomes (fig. 2), most academic staff had a strong belief that their institutions had been conducting a wide range of scientific research. The most popular types of research indicated by respondents were basic/fundamental ones (38% of answers) and applied research (40% of answers). Implementation work were not mentioned frequently, only 21% of this kind of answers. Applied research and imple-
Science and business cooperation on innovation evidence from Pomerania

mentation were pointed mostly by academics of Gdansk University of Technology, Maritime Academy and the Sea Fisheries Institute.

To define the connections between academia and industry and examine briefly their close contacts, a question was posed if business had participated in funding scientific research. The respondents were asked about ways to cover their costs of studies (fig. 3). As was observed, the most popular sources of financing scientific studies were public funds at national level – mainly state budget (27%) selected among all the wide range of funding research possibilities. The second place was taken by European Union programs (25%). A part of research work was covered by the home institution’s own budget (23%). Researchers of GMU mainly pointed to national funds, GUT usually selected EU and state budget, scientists of MA, UG and SFI got the financial support at home institution, national budget and EU as well. It is significant that only 3 institutions: GUT, MT and SFI were active in raising money for research from business side. Unfortunately such answers were indicated only 6 times per all 63 responses (9%). Most Pomeranian scientists didn’t recognize businesses as potential partners for supporting their research work with funds. Probably, the reason for this situation was closely identified with sorts of studies realized by researchers. They preferred fundamental and applied research, but most companies usually have been interested in a practical approach much more. They are focused mainly on implementation work. Companies, which suffer from a capital shortage and expect short-term results, are willing to pay for outcomes but only these which can be used at once. Results of fundamental or applied studies regularly need more time and their effects usually cannot be implemented in business immediately or they can sometimes be even simply unforeseen. It can cause that most academics support their fundamental/applied research with public funds. But parallel the private capital is not interested in financing this sort of studies being focused much more on outcomes of implementation work dedicated to individual companies and their real problems.

Fig. 3. Sources of research funding at universities and R & D units (multiple answer)

To define the connections between academia and industry and examine briefly their close contacts, a question was posed if business had participated in funding scientific research. The respondents were asked about ways to cover their costs of studies (fig. 3). As was observed, the most popular sources of financing scientific studies were public funds at national level – mainly state budget (27%) selected among all the wide range of funding research possibilities. The second place was taken by European Union programs (25%). A part of research work was covered by the home institution’s own budget (23%). Researchers of GMU mainly pointed to national funds, GUT usually selected EU and state budget, scientists of MA, UG and SFI got the financial support at home institution, national budget and EU as well. It is significant that only 3 institutions: GUT, MT and SFI were active in raising money for research from business side. Unfortunately such answers were indicated only 6 times per all 63 responses (9%). Most Pomeranian scientists didn’t recognize businesses as potential partners for supporting their research work with funds. Probably, the reason for this situation was closely identified with sorts of studies realized by researchers. They preferred fundamental and applied research, but most companies usually have been interested in a practical approach much more. They are focused mainly on implementation work. Companies, which suffer from a capital shortage and expect short-term results, are willing to pay for outcomes but only these which can be used at once. Results of fundamental or applied studies regularly need more time and their effects usually cannot be implemented in business immediately or they can sometimes be even simply unforeseen. It can cause that most academics support their fundamental/applied research with public funds. But parallel the private capital is not interested in financing this sort of studies being focused much more on outcomes of implementation work dedicated to individual companies and their real problems.
The crucial elements of conducting research work by scientists were their motives and themes of research. The motives had mainly depended on scientists’ individual preferences. 70% of responses pointed that they had been developing their own professional interests and 60% of respondents had been referring to their careers’ ambitions and aspirations. It was also pointed that themes arise from the rules of the unit and had been usually indicated by employees of the SFI.

To establish a connection between business and academia it was worth identifying the factors influencing the decisions to choose the area of research by Pomerania scientists. A question was posed of a role of real industry problems as a common phenomenon for scientists to inspire them to do their research work.

As outcomes showed (fig. 5), the most common source of scientific research inspiration for Pomeranian R&D staff was the results of their previous research (40% of answers). The second most popular one pointed by 40% of responses was information and materials collected by researchers during their participation in seminars and conferences. It was significant that only 12% of respondents’ answers indicated the source of inspiration for research which had come from business - solely respondents of GUT and SFI. Such a source of inspiration was indicated by 4 out of 5 respondents of SFI academic staff and 2 out of 7 respondents of GUT. The remaining answers were usually associated with scientific circles. Generally Pomeranian academic staff got their...
Science and business cooperation on innovation evidence from Pomerania

Inspiration to carry out their research work basing on science as a phenomenon in itself. It is worth noticing that conferences, seminars and scientific meetings, which Polish scientists take regularly part in, are usually devoted to theoretical discussion and literature studies. There are rarely case discussions. The limited numbers of answers concerned the business suggests strongly that Pomeranian researchers have got narrow knowledge about business problems to be solved. This is relevant to the outcome of the previous question. Respondents pointed quite rarely that they used to do the implementation work. The role of this kind of work is to find a solution for real industrial problems, which seems to be quite uninteresting to study or to be involved in for Pomeranian academic staff.

![Fig. 11. The utility of research for creation and implementation of innovative products in scientists’ opinions](image)

The next aim of the survey was to discuss at length the utility of Pomeranian research for creation and implementation innovative products on the market. In line with collected data (fig. 6), 85% of the respondents were convinced that their studies had been useful for industry in the aspect of innovation. Such an opinion was shared completely by all employees of the SFI and MUG. 85% of academics at GUT and 75% of Maritime Academy also demonstrated this belief. The minority of the tested population was against and explicated that their studies hadn’t been useful for innovation. These question didn’t give the answer if the outcomes of the conducted research work at Pomeranian universities and R&D units were not useful for the industry at all.

![Fig. 12. Scientists’ experience in business as employees](image)
An academics’ propensity to cooperate with business may be associated with researchers’ individual experience of being an employee in any business organization. Basing on the results (fig. 7), it was evident that most scientists had got almost no experience in practical work for companies as an employee. Only 1 out of 20 respondents had been working for an enterprise for more than 5 years. The next respondent confirmed that had been employed by a company for 1-3 years. 7 per 20 (35%) respondents had been employed for shorter than 1 year during their professional lives and the remaining 5 scientists had got completely no experience in working for any company. Such limited experience of being employees could have led to the lack of understanding of business functioning. In such a situation researchers had not got an occasion to understand how business had been run, how and why the enterprise had existed on the markets, what procedures and principles had been applied in companies. For most of researchers the inner functioning of business is still the \textit{terra incognita}. Most of Polish scientists start their professional careers just after graduating from universities. The majority of them haven’t got any employment agreements, some of them have never been in any company at all during their professional careers. It influences a lack of common language with business and understanding its perspective.

In spite of limited employment experience most tested scientists had got experience with business generally. Most of Pomeranian researchers had been involved in cooperation somehow. 71% of respondents confirmed that had been cooperating with any company during the survey was carried out. It is also significant, that such cooperation hadn’t been occasional or accidentally. 57% of academics had known other 5 or more people around them who had been a scientist involved in business cooperation. 7% of researchers had known at least 3 scientists who were in business contacts, the next 22% of respondents had known at least 2 such researchers. Only 7% of researchers hadn’t known any scientists around themselves who were scientists involved in business. So, the results were quite optimistic. The cooperation between science and business seems to be quite common at local level. This mutual collaboration was frequent and scientists were pretty active in the business contacts.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig1.png}
\caption{Current scientists’ cooperation with business}
\end{figure}
An interesting element to study was sorts of activities which researchers had been engaged in collaboration. The answer to the next question gave the idea for purpose of mutual contacts (fig. 9). The researchers were asked to point what activities they had offered for business in the aspect of product innovation. The most popular reason for mutual cooperation was preparing expertise, studies and analyses for new products (30% of answers), developing a new technology that contributed to the creation of product innovation (28%) and finding solutions of current technology problems to create new products or upgrading them (20%). Researchers had supported business with consulting service and training, assisting in innovative activities or sharing specialized equipment with company as well. As it was observed, the bilateral connections were closely identified with supportive work for business development and it played a pivotal role in bringing new knowledge to organizations.

The aim of the survey was to thoroughly examine the barriers to cooperation in the aspect of innovation (fig. 10). In accordance with the investigated data, a conviction existed among scientists that the scientific research offer hadn’t been attractive sufficiently for business so far. Research offer had no chance of success on the market and there had been a poor recognition of company technology needs by the unit which scientists represented. The indications corresponded closely to the next answer. There was limited ability to adapt solutions to business in terms of product innovation. One of the most popular answer for question of barriers, was that companies had not understood the needs and ways of the universities or R&D institution functioning. This answer was associated with the observed problem of a significant distance between business and academia generally. Scientists pointed that companies hadn’t understood them but also the same researchers highlighted that their scientific offer had been too poor for implementing on the market. Scientists admitted that they hadn’t been aware of real companies technological needs. Most the barriers are results of research policy at universities and R&D institutions. Commonly, Polish scientists are not evaluated by business approach, but mainly by conducting research and number of publications and collected points in the process of research work. Most of universities do not expect that their
academic staff will spend their professional work for solving business and industrial problems. Themes of research are usually selected by researchers basing on the individual interests of academics, rarely come directly from industry. This is the reason for limited ability to adapt the solutions to business and research offer has no chance for success. A gap between both sides is so huge that scientists feel that companies do not understand how their organizations just function and companies are confident that science is out of real life. Business perspective is focused on timing and efficiency, the academic one is much more orientated to research per se.

Fig. 3 Barriers to cooperation with business in scientists’ opinions

Summarizing, the pivotal role of this analysis was to firmly establish and briefly examine the role of universities and R&D institutions in the Pomeranian system of innovation. The aim was to identify the situation of these institutions in stimulating the development of the Pomeranian economy as well as to diagnose types, ranges and areas of research that these entities can provide to the regional industry in the aspect of innovation.

As it was observed, most of the researchers believed that universities and R&D units offered primarily education and teaching as well as conducting applied research for the industry. This strong belief existed among respondents from the Sea Fisheries Institute and the University of Gdansk. The respondents were convinced that their institutions had conducted a wide range of scientific research: mainly basic/fundamental, applied ones and implementation work. Applied research and implementation were pointed most often by academics of Gdansk University of Technology and the Sea Fisheries Institute. Among the wide range of possibilities for research funding, the most popular sources were public funding from national resources - mainly from state budget. The second place was taken by EU funds and home institutions enabling research work. Companies as a payer were mentioned too quite rarely (9% of answers). The most common source of inspiration for scientific research for Pomeranian R&D academics was the results of their previous research. Another important factor in stimulating research work was information and materials collected during seminars and conferences. Only 12% of respondents’ answers indicated that the source of inspiration
for research had come from business - merely respondents of GUT and SFI. The motivator to conduct research work among Pomeranian scientists was primarily a desire to develop their own professional interests and ambitions as well as career aspirations of the respondents. According to the survey, scientists of Pomeranian universities and R&D units generally do not have large experience in working for commercial companies. Over 35% of respondents had never worked in any company, and another 50% had such an experience in the business which gained no more than one year. Only one person had been working for a company for at least five years. This condition can explain the low efficiency of implementation research in Pomerania. It seems to be related to lack of knowledge of business functioning and its real needs among academics in the region. No individual employment experience made for academics difficult to understand the objectives and the realities of business organizations. On the other hand 75% of respondents kept working with companies. Such cooperation was mostly declared by scientists of Gdansk University of Technology and the Sea Fisheries Institute. In addition, nearly 60% of respondents knew at least 5 people in their circles who had been involved in cooperation with business. Another 20% stated that they had known two people who had established business cooperation. This indicates a certain degree of activity of Pomeranian researchers in the field of commercialization of knowledge from the field of research to the local economy.

5. Conclusions

Referring to the outcomes of the survey, it should be noted that local universities and R&D units plays a wide range of roles in Pomeranian system of innovation: education and teaching as well as conducting applied research work for the industry. Scientists believed in a utility of their research for the local industry, however their research (fundamental and applied) has limited potential in contributing to innovation. According to the outcomes of the survey, some conclusions can be drawn and proposed.

Firstly, most Pomeranian scientists didn’t recognize businesses as potential partners for supporting their research work with funds. Probably, the reason for this situation was closely identified with sorts of studies realized by researchers. They preferred fundamental and applied research, but most companies usually have been interested more in a practical approach. They are focused mainly on implementation work. Companies, which suffer from a capital shortage and expect short-term results, are willing to pay for outcomes but only these which can be used at once. Results of fundamental or applied studies regularly need more time and their effects usually cannot be implemented in business immediately or they can sometimes be even simply unforeseen. It can cause that most academics support their fundamental/applied research with public funds. But parallel, the private capital is not interested in financing this sort of studies and is focused much more on outcomes of implementation work dedicated to individual companies and real business problems.
Secondly, tested researchers rarely drew ideas for their studies from business and didn’t treat companies as potential partners for run mutual cooperation. Scientists were focused on basic research but most companies expected solving their real problems which concerned implementation work (Badowska, 2010). Generally Pomeranian academic staff got their inspiration to carry out their research work basing on science as a phenomenon in itself. It is worth noticing that conferences, seminars and scientific meetings, which Polish scientists take regularly part in, are usually devoted to theoretical discussion and literature studies - there are rarely case discussions. The limited numbers of answers concerned the business suggests strongly that Pomeranian researchers have got narrow knowledge about business problems to be solved. This is relevant to the outcome of the previous question. Respondents pointed quite rarely that they used to do the implementation work. The role of this kind of work is to find a solution for real industrial problems, which seems to be quite uninteresting to study or to be involved in for Pomeranian academic staff.

Thirdly, Pomeranian – but probably most of Polish scientists – have limited experience in being employees of any company. It could have led to the lack of scientists’ understanding of business functioning. In such a terms researchers had not got an occasion to understand how business had been run, how and why the enterprise had existed on the markets, what procedures and principles had been applied in companies. For most of researchers the inner functioning of business is still terra incognita. Most of Polish scientists start their professional careers just after graduating from universities. The majority of them haven’t got any employment agreements, some of them have never been in any company at all during their careers. It influences the lack of common language with business and understanding its perspective. Scientists pointed that companies hadn’t understood them but also the same researchers highlighted that their scientific offer had been too poor for implementing on the market. They hadn’t been aware of real technological needs. Most the barriers are results of research policy at universities and R&D institutions. Commonly, Polish scientists are not evaluated by business approach, but mainly by conducting research and number of publications and collected points in the process of research work. Most of universities do not expect that their academic staff will spend their professional work for solving business and industry problems. Themes of research are usually selected by researchers basing on the individual interests of academics, rarely come directly from industry. This is the reason for limited ability to adapt the solutions to business and research offer has no chance for success. A gap between both sides is so huge that scientists feel that companies do not understand how their organizations just function and companies are confident that science is out of real life. Business perspective is focused on timing and efficiency, the academic one is much more orientated to research per se.

Summarizing, there was observed a huge gap between academia and business especially in the terms of expectations. Scientists are convinced that the outcomes of their work have limited ability to adapt solutions to business in the aspect of product innova-
The scientific research offer is not attractive enough for business partners and has no chance for success on the market. Academics feel that business completely doesn’t understand university and R&D institutions.

Having in mind the above conclusions, a few implications can be suggested: scientists should be more focused on companies’ needs. Scientists should spend more time in companies inside - not only as external experts, but also as employees which may help them to understand the functioning of business. Research subjects should be discussed with business more often to verify the necessity and reasonableness of conducting applied studies in the aspect of new knowledge for business. There is a strong need to create a platform of communication which will help both sides to be in permanent contact and support the academia to fulfill its “third mission” more actively. This implication should be implemented by national policy makers as well as university ones to support science in being more open for economical and social development.

7. References:

Summary
Creating a broadly defined innovation is highly desirable, although extremely difficult and characterized by a high risk of a failure. One of innovation pillars is an availability of an acquisition of appropriate resources. If a company is not ready for generating new knowledge itself, it should be open for searching partners outside who are able to bring new knowledge to the organization. Partners could be found in the regional or national system of innovation, mainly among universities and R&D institutions. A regional innovation system plays an extremely important role in the innovation process, in which universities are acting as the first generators of new knowledge which is necessary for innovation in local enterprises.
The aim of this chapter is to present a role of universities and R&D institutions in Pomeranian system of innovation. The researcher expected to firmly establish and briefly examine the role of universities in the RSI and to define connections between academia and business in the aspect of innovation. As it was observed, most of the researchers believed that universities and R & D units offered primarily education and teaching as well as conducting applied research for the industry. The respondents were convinced that their institutions had offered a wide range of scientific research: mainly basic/fundamental, applied and implementation work. Among the wide range of possibilities for research funding, the most popular source was public funding from national resources - mainly from state budget and EU funds. Companies as payers were mentioned too rarely (9% of answers). The most common source of inspiration for scientific research was the results of their previous research. Only 12% of respondents’ answers indicated the source of inspiration for research had come from business. According to the survey, Pomeranian universities and R&D units’ researchers generally do not have large experience in working for commercial companies. Over 35 % of respondents had never worked in any company, and another 50 % had experience in the business which gained no more than one year. This condition can explain the low efficiency of implementation research in Pomerania. It seems to be related to the lack of knowledge of business functioning and its real needs among academics in the region. No individual employee experience made it difficult to understand the objectives and the realities of business organizations. On the other hand 75% of respondents kept working with companies. This indicates a certain degree of activity of Pomeranian researchers in the field of commercialization of knowledge from the field of research to the local economy. A huge gap was observed between academia and business especially in the terms of expectation. However the first one is quite aware of this problem. Scientists are convinced that the outcomes of their work have limited ability to adapt to business in terms of product innovation. The scientific research offer is not attractive enough for business partners and has no chance for success on the market. Academics feel that business completely doesn’t understand university and R&D institutions. Having in mind above conclusions, a few implications can be suggested: scientists should be more focused on companies’ needs. Scientists should spend more time in companies inside not only as external experts, but also as employees. It may help them to understand the functioning of business. Research subjects should be discussed with business more often to verify the necessity and reasonableness of conducting applied studies in the aspect of new knowledge for business. There is a strong need to create a communication platform which will help both sides to be in permanent contact and support academia to fulfill its “third mission” more actively. This recommendations should be implemented by national policy makers as well as university’s ones to support science in being more open for economical and social development.
Abstracts

Chapter 1. Bryan CHRISTIANSEN: Enhancing the Global Classroom for Contemporary Globalism

Globalization of the 21st century has changed economic and other realities far beyond the expectations of most individuals; the worldwide financial meltdown of 2008 serves as a particularly pervasive example. Experts in business, education, finance, government, and other fields are still working to revise various systems and infrastructures that will operate in a robust manner within the new realities of today. This chapter focuses on the educational aspect of that massive effort by briefly comparing two countries with very different cultural, economic, and geopolitical situations: Turkey and the USA. These two nations can serve as model examples for other countries with similar backgrounds from which a general analysis can be derived for future discussion on educational issues. The chapter commences with an introduction to the realities of contemporary globalism that underscore the very purpose for this chapter, and the body then outlines in some detail the current systems in the two countries. There is also discussion about the need for culturally responsive teaching (CRT) in the “global classroom” that exists today. The conclusion synthesizes the earlier discussions and provides suggestions to create a paradigm shift in thinking required for most educational structures. The author forwards that many papers on education do not sufficiently cover the practical application of and reasons for educational reforms today. Therefore, it is believed this effort shall assist in rectifying the situation.

Keywords: Contemporary education, Cultural dimensions, Restructuring, Global labor markets, Hypercompetition, Diversity education, Transcultural
JEL codes: A20, I21, M10

Chapter 2. Anita RICHERT-KAŹMIERSKA: Methodology of entrepreneurship teaching in tertiary education - experiences of the Faculty of Economics Management on the Gdańsk University of Technology

The purpose of the chapter is an overview of the available methods and techniques of teaching entrepreneurship at the academic level, as well as the presentation of the methodology of the work with students within the framework of the Entrepreneurship course at the Faculty of Management and Economics of the Gdańsk University of Technology. Author of the chapter is also the author of the Entrepreneurship course implemented at the Faculty of Management and Economics of the Gdańsk University of Technology. She decided to use just those activating methods that involve new ways of working with students. Experience in working with them is satisfactory both in the opinion of students (as reflected, i.a., by a high rate of attendance, high activity in the classroom, the quality of project preparation and the comments contained in the periodic evaluation of teachers made by the students at the end of each semester) and in the perception of the teacher.

Keywords: entrepreneurship, teaching methodology, activating methods of teaching
JEL codes: A23, L26
Chapter 3. Artur ZIÓŁKOWSKI, Kamil ZIÓŁKOWSKI: The role of case studies and management experience in the education and personal development of IT project managers

The purpose of this chapter is to indicate the need for project management experience and knowledge in order to improve the competence of IT project managers. In the first part of the chapter there is shown the impact of experience on the development of project management skills. Also the need for having historical data about the projects - in order to make better project decisions - is shown in the chapter. In the following parts of the chapter, there is information about importance of case studies for acquiring knowledge about PM. There is also presented a case study model for the purpose of improving managerial skills. The chapter is finished by the presentation of the concept concerning saving project experiences to improve project management. There is also presented the concept of expanding PM tools for external modules allowing to analyze early project decisions. These modules can be used to make better decisions in future projects and also have educational role by enabling access to historical knowledge from completed projects.

Keywords: IT project management, experiences and knowledge management

JEL codes: D89, D83, O22

Chapter 4. Anna DZIADKIEWICZ, Joanna NIEŻURAWSKA: Design of a learning process for SME managers (in different generations)

The twenty-first century is the time of business changes. Newcomers who graduate from schools are actual or potential managers, working mainly in the SME sector. They represent the so-called Generation Y. It means that their attitude to work is completely different from their senior managers'. The present chapter indicates the techniques and methods used by trainers and coaches to build a complex training program aimed at the creation of a compact organizational behavior. It is pointed out how to develop in Generation X representatives the capacity to “see with their (young people's) eyes” and “see with their minds” so as to tap into their sense of curiosity and make them aware of the kind of motivating tools that are acceptable for Generation Y in the face of newcomers, who are called Generation L.

Keywords: SME managers, generation X, Y, L, new techniques of learning: coaching, mentoring, on the job training, job shadowing

JEL Codes: A2, O2, O3

Chapter 5. Tatiana KURBANOW: Personal learning environments of Polish academic participants

The present chapter seeks to outline the basic concepts concerning the relatively new phenomenon in education, the Personal Learning Environment. Digitization has a huge impact on all realms of human functioning, and education is not the exception. As research and innovation push forward economy, our knowledge and qualifications constantly need upgrading, imposing on us the need for lifelong learning. Thus, the task of the contemporary university is not to
transfer a certain body of knowledge to students, but rather to prepare them for self-initiated sustainable education throughout their after-university professional careers. In the theoretical part of the chapter I review the potential of the emerging technology to facilitate learning, which consists in (1) its being an information delivery vehicle, and (2) in the social nature of the new media, which allow learners to create networked communities for learning. The concept of Personal Learning Environment (PLE) has gained scholars’ attention since and it can be defined as a means to independently integrate educational data and information from diverse resources and contexts (both Internet and paper-based). Initially, PLE was recognized in informal learning. Currently, however, more and more institutions are experimenting with introducing PLEs to formal learning courses, in order to create conditions for students' active and meaningful formal learning experiences. I highlight the pedagogical foundations and technological solutions to integrate PLEs into the formal learning settings. The final part discusses the results of the interview I conducted with 18 respondents (11 students and 7 academic teachers) with the aim to identify what kind of Personal Learning Environments they construct and whether they find it beneficial to support learning. Since my research group was very limited, the interview results can be treated only as the attempt of a preliminary insight into the subject matter with suggestion that PLEs deserve further research and application, due to their power to unite formal and informal learning, to offer learners opportunities to pursue their individual educational goals, and to expand learning far beyond the classroom.

**Keywords:** Personal Learning Environment (PLE), Personal Learning Network (PLN), lifelong learning, Open Educational Resources (OER), constructivism, connectivism.

**JEL Codes:** I2

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**Chapter 6. Viera MARCINOVA: Evaluation of the employee development system**

Managers nowadays are aware of the importance of human resources development and needs to measure the impact of investment into the employee development to the company success. There are various methods and measures for expressing dependence between the investment to employee development and company success. This chapter, based on various researches of authorities within the domain of human resources development professionals, is focusing on the method comparing Return on Investments into Human Resources Development programs. Kirkpatrick’s methodology was expanded by many experts in this domain, and this chapter describes also the limitations of the measurement of return on investment of human resource development initiatives or programs in providing the kind of information needed by decision makers in the company. This could be the challenge for HRD professionals, who can evaluate also qualitative data as inputs of the evaluation.

**Keywords:** Human Capital; Skills; Occupational Choice; Labor Productivity

**JEL codes:** J24
Chapter 7. Joanna CZERNA-GRYGIEL: Human capital management in enterprises in knowledge based economy conditions

The knowledge-based economy in the developed countries is characterized by a lot of investment in human capital. In economics the idea of human capital means mainly the amount of knowledge and human abilities, which are measured with the level and quality of education. Human capital is also defined as a sum of knowledge, abilities, skills and experiences of employees and managers, which we can use in performing the tasks assigned to them, as well as the ability to enhance these resources with the help of education. Education is an important indicator of human capital. It is correlated with the economic growth, because it needs a lot of investment. This interdependence is based on creating working conditions for educated people through the development of knowledge-absorbing economic directions. Peter Drucker, a prominent theoretician, added one more task to the four classic management tasks: planning, organizing, motivating and controlling. This additional task is human development. It should be gaining more and more importance as investment in human capital and is becoming the main priority for many companies. Knowledge has become the key to success of modern enterprises and it is the main source of competitive advantage. The opinion that intangible assets investment is more profitable than tangible assets investment is becoming more and more common. This opinion is confirmed by Charles Handy who emphasises that at the present level of economic development the value of a company’s human capital is several times higher than the value of tangible assets. Presented researches show the need of constant qualifications improvement in knowledge based economy, so investment in human capital development can be an important management tool enabling competition leadership of the company. The education system, as well as expertise getting and trainings of people employed in economic initiative system are the basic condition of effective human resources management in knowledge based economy.

Key words: knowledge based economy, human capital, management, enterprise
JEL Codes: HS4

Chapter 8. Hanna KRUK: Environmental aspects of entrepreneurship - necessity in business education

According to the principles of the European Union, the topic of sustainable development is strongly emphasized. The environmental law is becoming stricter, which means new questions and challenges for enterprises comprising: eco-innovations, eco-certifications, implementing ISO and EMAS systems, renewable energy sources, natural resources estimation, environmental impact assessment, water, energy and waste management, restriction related to various protected area etc. Therefore, all of the above-mentioned environmental aspect of economic activities should be known to managers and businessmen. The following chapter is an attempt to identify the most frequently lectured modules devoted to these topics that are incorporated in management and economics studies at randomly selected Polish universities (9 universities, 7 universities of technology and 2 universities of economics). It also presents examples of studies in Poland including such subjects. Generally speaking, many study curricula at universities
include courses concerning environmental aspects of enterprises’ activity but they are mostly general in character (sometimes only optional) and not all important contents (from managers’ or owners’ points of view) are available. Such modules are often accessible at selected specialities. The situation is constantly improving – more and more universities have such lectures or modules on their offer or sometimes they even prepare the whole specialties related to environmental aspects of management or economics. However in spite of ameliorating the situation, changes made in study programmes seem to be quite insufficient and some other actions are needed to widen ecological awareness of future businesspeople and managers.

**Keywords:** enterprises’ management, sustainability, environment, universities, Poland  
**JEL Codes:** A23, A12, Q01, Q5

### Chapter 9. Sylwia BADOWSKA: Science and business cooperation on innovation – evidence from Pomerania

According to the European Scoreboard 2013, Poland took the 4th place at the end of innovation. The low score in the ranking dictated by the multiannual low expenditure on R & D, but also insufficient competence of enterprises in designing and implementing innovation. In the knowledge-based economy, innovation is a new engine of companies’ growth. Creating a broadly defined innovation is highly desirable, although extremely difficult and characterized by a high risk of a failure. One of innovation pillars is an availability of an acquisition of appropriate resources. In this case, the key to success is a properly prepared own organization of human capital and companies’ ability to absorb specific knowledge needed in innovation processes. If a company is not ready for generating new knowledge itself, it should be open for searching partners outside who are able to bring new knowledge to the organization. One of these partners could be found in the regional or national system of innovation, mainly among universities and R&D institutions. A regional innovation system plays an extremely important role in the innovation process, in which universities are acting as the first generators of new knowledge which is necessary for innovation in enterprises. More over they prepare skilled employees for industry. Universities are a kind of a conveyor belt of new knowledge and skills to business. The effectiveness of filling these roles by universities is dictated by a level of new knowledge and practical competence of these units’ academic staff. Personal contacts academics with business, practical experience of researchers in collaboration with industry, as well as openness to the applicability results of their research in practice are the elements of supporting pro-innovation activities in the regional innovation system. The paper sheds light on the role of universities in Poland in the aspect of the “third mission”, the complex nature of the relationship between the university and industry, firmly established a connection between business and science and capacity for mutual cooperation from the academia’s perspective.

**Keywords:** innovation, a role of universities, universities’ third mission, science and business cooperation  
**JEL Codes:** O3
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