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Innovative Pedagogical Approaches in Management Sciences

ABSTRACT

Objective: The objective of the paper is to present the chosen innovative pedagogical approaches of teaching in the area of management science and their practical application in the educational process at the Lodz University of Technology, as well as to discuss the opinions of students and managers concerning the innovative pedagogical approaches of teaching.

Methodology: The first stage of research was conducted among 200 young respondents (19-24 years old), students of Lodz University of Technology (Poland) in the second and third quarters of 2018. During the research, the indirect method of gathering information, i.e. using a survey technique was applied. The survey was conducted among the students with the application of the techniques of personal survey, electronic survey and paper survey. The second stage of

research was conducted among 50 managers of medium and large companies in Poland in the second and third quarters of 2018. The choice of companies to be studied was a deliberate one. During this stage of research, the indirect method of gathering information – using a survey technique was applied. The survey was conducted among the managers with the application of the techniques of personal survey, electronic survey and paper survey. The Likert scale was used for evaluation.

Findings: The situation on the labour market, as well as the development of the market of educational services and the development of new technologies cause changes in both the offer and the quality of teaching. In order to increase the quality of the educational offer and the degree of satisfaction of students and employers, universities introduce new teaching methods and new didactic tools based on the creative pedagogical approaches. The research results confirm the positive evaluation of Problem-based learning and Design Thinking approaches by students and companies representatives. However, closer cooperation between university and companies is expected both by students and managers.

Value Added: In this paper, apart from presenting the theoretical and practical possibilities of using Problem-based learning and Design Thinking approaches of teaching in the area of management science, the opinions of students and companies' representatives were also presented.

Recommendations: Effective teaching in the field of management at the universities is a difficult and complex process. Management is – by its character – closely related to business practice. Therefore, a management graduate should, in addition to having theoretical knowledge, be prepared to solve real problems in the enterprise.

Key words: management, education, Problem Based Learning (PBL), Design Thinking, creative pedagogical approaches

JEL codes: A23, M53

Introduction

In times of globalization and development of a knowledge-based economy, we can observe an increase in the demand for staff with higher education. The main element of providing knowledge is didactics. In the course of studies the university should provide students of management sciences a broad, interdisciplinary knowledge, allowing – based on a holistic approach – to find new creative solutions to future social and economic problems. The

university should create conditions in which graduates will create attractive strategies for the development of organizations, and design effective ways of implementing them in the conditions of expanding processes of internationalization and globalization. Consequently, management education needs more emphasis on skills development.

Today, education in the area of management is very popular, taking into account both the number of fields of study and number of students. However, more and more graduates of management have problems with finding a job. It results, among others, from the lack of practical skills and socio-psychological competences. Employers pay special attention to the lack of graduates' qualities such as flexibility, creativity, teamwork and ability to solve problems. One of the reasons for this situation is the fact that universities are – in most cases – oriented towards mass education, which leads to a decrease in the quality of educational services and the limitation to knowledge transfer without shaping skills.

There is no one model of manager education in the world. National culture, economic model, state policy, history of education and many other factors have impact on the way of preparing the educational offer and learning process. In recent years, managerial education has been the subject of many discussions regarding changes in curricular content and teaching methods. These changes should be based on an analysis of expectations, needs and preferences of university partners. Analysis of employers' expectations towards the university regarding graduates and students points to the need to focus on shaping practical skills through appropriately implemented activities, modification of teaching methods as well as compulsory internships in the enterprises.

The objective of this paper is to present the chosen innovative pedagogical approaches of teaching in the area of management science and their practical application in the educational process at the Lodz University of Technology, as well as to discuss the opinions of students and managers concerning the innovative pedagogical approaches of teaching.

Chosen innovative pedagogical approaches in management sciences

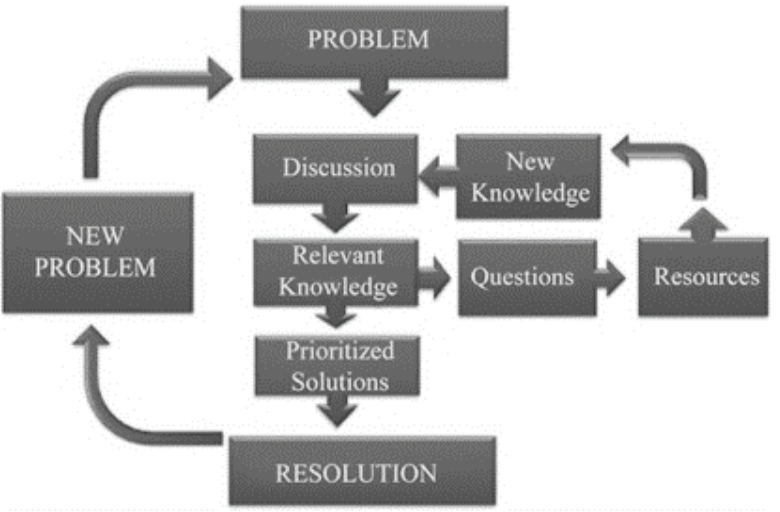
For the purpose of this article, two innovative, creative pedagogical approaches applied at the Lodz University of Technology in management sciences were chosen: Problem-based learning and Design Thinking.

Methodology of Problem-based learning (PBL)

Problem-based learning is an innovative educational approach that is gaining importance in higher education, using real problems or situations as a context for learning. Problem-based learning is an approach encompassing interdisciplinary learning.

Problem-based learning (PBL) is a pedagogy specifically created for the integration of content knowledge and skill development (Figure 1). The PBL process develops critical thinking and problem-solving skills, problem synthesis skills, imagination and creativity, information search and evaluation skills, ability to deal with ambiguity and uncertainty, oral and written communication skills, and collaboration skills (Ungaretti et al., 2015, pp. 173–186). There is evidence that PBL supports the need to engage students, a key element in improving learning outcomes and student satisfaction (Dean & Jolly, 2012, pp. 228–243; Hallinger & Lu, 2011, pp. 279–299).

Figure 1. Example of the Problem-Based Learning Process



Source: Ungaretti, T., Thompson, K., Miller, A., & Peterson, T. (2015). Problem-Based Learning: Lessons From Medical Education and Challenges for Management Education. Academy of Management Learning & Educations 14(2), pp. 173–186.

In a problem-based learning model, students engage complex, challenging problems and collaboratively work toward their resolution. Teams identify what they already know what they need to know, and how and where to access new information that may lead to resolution of the problem (Lodz University of Technology, 2015b).

The International Faculty of Engineering (IFE) of the Lodz University of Technology has compulsorily introduced the PBL method into the curriculum in the academic year 2008/2009. The new method of education covered the second year students of all programs offered by IFE, including specialisations "Business and Technology" and "Gestion et Technologie". In the case of these specialisations, implemented projects usually concern management issues. Students often receive a real problem for a specific company to solve. Lecturers cooperate with many companies which allows them to create projects based on real problems, both in the field of strategic

and operational management, as well as management in individual areas (such as logistics, human resources or finance).

Three basic phases of the project can be distinguished:

- Associating a problem situation;
- Creating ideas for a solution;
- Checking the solution combined with systematizing the acquired messages.

The project includes:

- Familiarizing the group with the subject;
- Problem identification;
- Gathering information: secondary research, discussions, study visits;
- Choice of the action plan;
- Defining the specific objectives of the project;
- Midterm presentation;
- Implementation of the project according to the plan chosen by the students;
- Formulation of recommendations;
- Preparation of the final report;
- Final presentation.

A characteristic feature of the problem-based learning is the development of learning process in a group. The group is accompanied by a tutor who supports and motivates students. The task of the tutor is not to propose ready solutions, but to observe and assist students while solving problems and implementing the project. The lecturers do not have continuous control over the students, but only exert impulses, support and give advice. The plan of activities is controlled by students. Therefore, the organization and shaping of the teaching process is a task for students. This learning method involves changing roles. The student assumes an active role in the group. Among the tutor's tasks, we can distinguish: observation of group work, assistance in case of organizational, communication or theoretical problems.

PBL is a teaching method in which students learn about a subject through the experience of solving an open-ended problem. During the process of

PBL education, students learn to analyse, search, discuss, evaluate a topic or question, compare, choose and finally search for and propose solutions. These competencies are crucial in case of effective teaching in the field of business for development of managerial skills.

Methodology of Design Thinking (DT)

In recent years focus has been growing on the innovative and profit generating value of design thinking in businesses. Several big successful international firms like General Electric, Procter&Gamble, Sony, and Philips use a design thinking perspective as a problem-solving apparatus across the company. While the importance of design in business has been well established, the contributions of design were best known and valued in innovation management including new product and new service development (Utterback et al., 2006). More recently, design thinking has moved from product and process design to becoming a key element in company strategy (Camillus, 2008, pp. 99–106; Fleetwood, 2005; Verganti, 2008, pp. 436–456). That is why, learning based on the design thinking is so important for future managers.

Design thinking has been identified as making valuable contributions to **business** and management, and the numbers of higher **education** programs that teach **design thinking** to business students, managers and executives are growing (Nielsen & Stovang, 2015, pp. 977–991; Matthews & Wrigley, 2017, pp. 41–54). However, despite its growing importance, the implementation of **design thinking** into **business education in several countries** is slow and partial, although **business education** today is in a crisis as traditional pedagogic tools fall short of raising individuals who can meet the challenges of the 21st century (Çeviker-Çınar et al., 2017, pp. 977–987). Management education has added design thinking and design methods into current programs through building alliances with design schools. The challenge for business schools is to incorporate such notions and methods into more integrated formulation and delivery (Matthews & Wrigley, 2017, pp. 41–54).

Design thinking is a creative process that enables academics to meet students' needs and to raise innovative individuals, it emerges as a contemporary pedagogic tool. It is a method to develop and promote creativity and innovation in problem solving through the use of prototyping (Piotrowska, 2015, pp. 1534–1538). According to Brown (2008, pp. 85–92), design thinking includes: empathy, integrative thinking, optimism, and collaboration to transform the way a company develops products, processes and strategy.

Design Thinking Method has been used in problem-based projects conducted at the International Faculty of Engineering for several years. At the beginning, it was implemented for Computer Science program conducted within 5-year MSc scheme and later implemented into Problem Based Learning (PBL) Team Projects at the first cycle study for "Business and Technology" specialisation.

Some of the prototype solutions and services created by IFE students through design thinking have already achieved international successes such as gaining awards at international exhibitions of inventions and innovations. The projects "System for digital content optimization for the visually impaired people" and "Automatic driver notification about detection of the emergency vehicles" won gold and silver medals at exhibitions in Brussels, Zagreb and Warsaw as well as at the World Cup of Computer-Implemented Inventions in years 2008–2011. IFE students were also finalists of some other major inventor competitions including United Nations endorsed ITU World Young Innovator Competition (Lodz University of Technology 2015).

One of the initiatives associated with the implementation of the methodology of design thinking in education programs at Lodz University of Technology was an Erasmus Intensive Project entitled DESTINE (DESign Thinking in EngINEring). DESTINE was implemented jointly by the International Faculty of Engineering and the Institute of Applied Computer Science and involve 6 partner institutions from Spain, France, Germany, Cyprus, Scotland and Sweden. The project received funding in 2013, and took place in July 2014. The project was carried out around innovative problem-design classes for

multicultural student groups, which were the cumulated during a two-week workshop project in Lodz (Lodz University of Technology 2015a).

An evaluation of innovative pedagogical approaches of teaching – results of empirical study

Research Methodology

The main objective of the empirical study was to identify the opinions of students and managers concerning the innovative pedagogical approaches of teaching.

Two stages of research were applied:

- the first stage of the study: a survey among 200 young respondents (19–24 years old), students of Lodz University of Technology (Poland),
- the second stage of the study: a survey among 50 managers of medium and large companies in Poland.

The first stage of research was conducted among 200 young respondents (19–24 years old), students of Lodz University of Technology (Poland) in the second and third quarters of 2018. A method of the non-probability sampling, which is based on the convenience sampling was used. During the realization of research, the indirect method of gathering information, using a survey technique was applied. The survey was conducted among the students with the application of the techniques of personal survey, electronic survey and paper survey. The Likert scale was used for the evaluation (Table 1).

Table 1. Characteristic of the research among students

Scope of studies	Characteristics
Objective scope	Identification of the opinions of students concerning the innovative pedagogical approaches of teaching
Subjective scope	200 young people (19-24 years old), students of Lodz University of Technology (Poland)
Spatial scope	Lodz Province (Poland)
Time range	The second and third quarters of 2018

Source: own elaboration.

The second stage of research was conducted among 50 managers of medium and large companies in Poland in the second and third quarters of 2018. The choice of companies to be studied was a deliberate one. During the realization of research, the indirect method of gathering information, using a survey technique was applied. The survey was conducted among the managers with the application of the techniques of personal survey, electronic survey and paper survey. The Likert scale was used for the evaluation (Table 2).

Table 2. Characteristic of the research among managers

Scope of studies	**Characteristics**
Objective scope	Identification of the opinions of managers concerning innovative pedagogical approaches of teaching
Subjective scope	50 managers of medium and large companies
Spatial scope	Poland
Time range	The second and third quarters of 2018

Source: own elaboration.

To evaluate students' and managers' opinions concerning Problem-based learning and Design Thinking approaches, the respondents were asked to

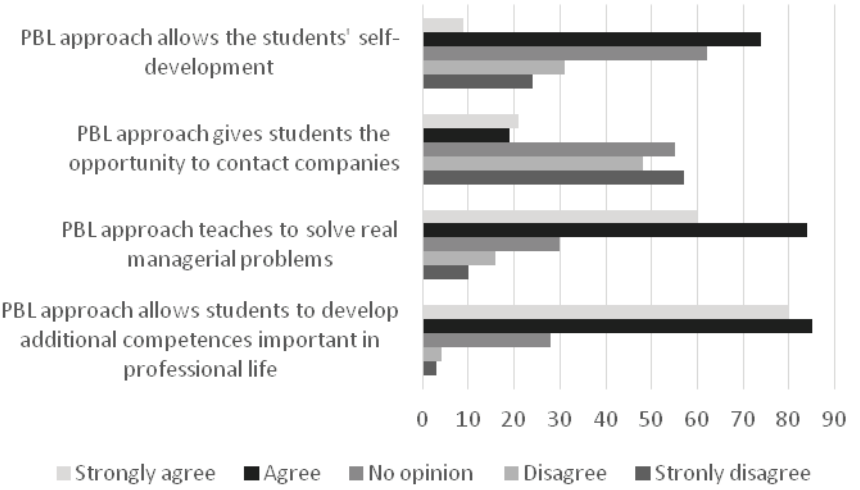
assess in scale (from -2 "strongly disagree" to 2 "strongly agree") the following opinions:

- Problem-based learning approach allows students to develop additional competences important in professional life.
- Problem-based learning approach teaches to solve real managerial problems.
- Problem-based learning approach gives students the opportunity to contact companies.
- Problem-based learning approach allows the students' self-development.
- Design thinking approach allows students to develop additional competences important in professional life.
- Design thinking approach teaches to solve real managerial problems.
- Design thinking approach gives students the opportunity to contact companies.
- Design thinking approach allows the students' self-development.

Research Results

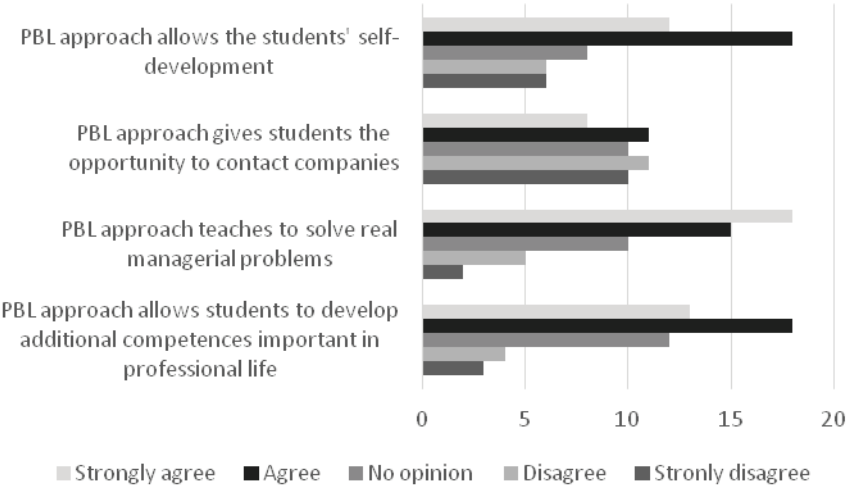
The research results confirm the positive evaluation of Problem-based learning approach by students. They agree that Problem-based learning approach teaches to solve real managerial problems and allows students to develop additional competences important in professional life. In the opinion of the majority, Problem-based learning approach also allows the students' self-development. However, in the students' opinions, Problem-based learning approach does not give students the opportunity to contact companies, so important in case of managerial studies (Figure 2).

Figure 2. Students' opinions concerning PBL approach



Source: own elaboration.

Figure 3. Managers' opinions concerning PBL approach

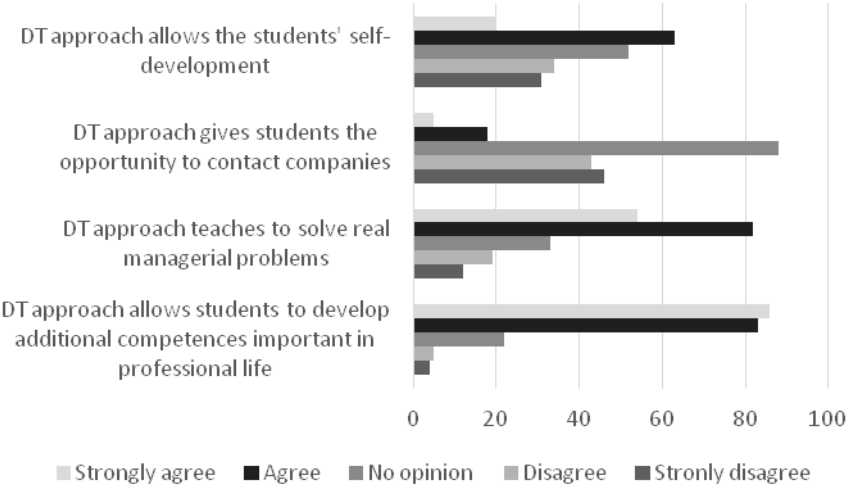


Source: own elaboration.

The managers opinions are also optimistic. They appreciate the Problem-based learning approach especially as the opportunity of development of additional competences important in professional life and of the self-development, as well as the opportunity to solve the real managerial problems (Figure 3). Similarly to the students, the surveyed managers also poorly assessed the possibility of contacting companies due to the implementation of projects based on the PBL approach. This issue should be analysed by university's authorities responsible for learning process. A closer cooperation between university and companies is expected by both parts, students and managers. Perhaps, the representatives of companies should be more involved in the realisation of PBL projects and more projects should be implemented into the companies.

The research results also confirm a positive evaluation of Design Thinking approach by students. They agree that Design Thinking approach teaches to solve real managerial problems and allows students to develop additional competences important in professional life. However, as in case of evaluation of PBL approach, in the students' opinions, Design Thinking approach does not give students the opportunity to contact companies and to solve real managerial problems (Figure 4).

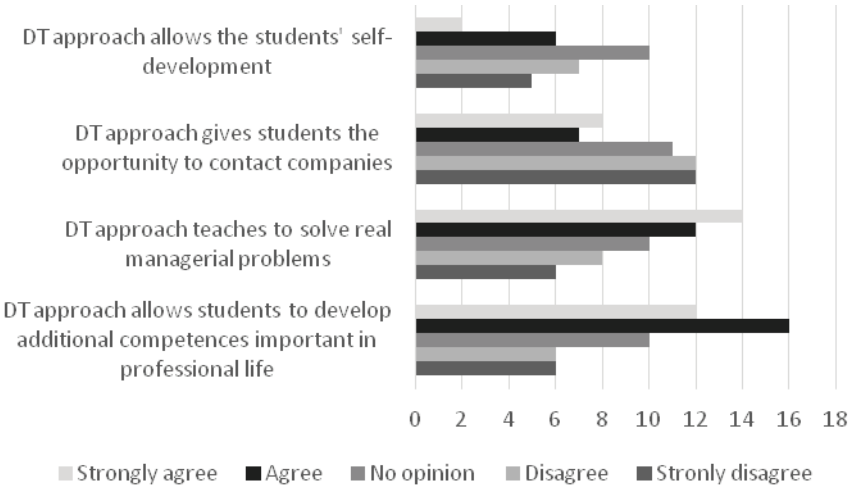
Figure 4. Students' opinions concerning DT approach



Source: own elaboration.

The managers evaluated DT approach worse than PBL method. They appreciate the Design Thinking approach especially as the opportunity of development of additional competences important in professional life. Interestingly, according the companies representatives, DT approach prepares students to solve real managerial problems (as opposed to student feedback). However, the opinions are not evident in the case of evaluation of self-development possibilities, as well as the opportunity to contact the company (Figure 5). As in the case of the PBL projects, Design Thinking approach should be also developed in close cooperation between university and companies.

Figure 5. Managers' opinions concerning DT approach



Source: own elaboration.

The conclusions in this study are presented with the caveat to the limitations of the samples (200 students representing one university and only 50 managers representing one country). To provide a more comprehensive picture of the evaluation of innovative pedagogical approaches of teaching, similar studies could be conducted in other universities and countries.

Advantages and disadvantages of innovative pedagogical approaches of teaching

Implementation of the innovative, creative pedagogical approaches of teaching provides several advantages but is also related with different problems for all parts of the process: teachers, students and university as organisation (Table 3).

The university that implement new pedagogical creative approaches have a chance to increase the organisation's recognition and prestige by receiving different certificates and increasing the interest of Polish and for-

eign candidates. By development of projects conducted with business, they can also reinforce cooperation with external partners. On the other hand, it can also provoke some organisational problems related with organisation of trainings, management of didactic workload during trainings as well as financial challenges for university units.

The university staff has the opportunity for self-development and work in the international environment. However, implementation of the new methods is connected with the pressure on lecturers who have to constantly improve their qualifications and supplement their existing professional skills.

Table 3. Advantages and disadvantages of the creative pedagogical approaches of teaching

Actor	Advantages	Disadvantages
University	Prestige Interest of candidates Foreign students Certificates Cooperation with external partners Staff development	Organisation of classes during the absence of lecturers Financing of trainings for staff Organisation of trainings for staff Cost of teaching (smaller groups) Arrangement of working space (for small groups) Lack of qualified staff
Lecturer	Self-development New challenges Working in international environment Possibilities of mobility	Pressure Lack of time due to the long trainings Increase of competition
Student	Development of key competences important in professional life Real-life problems Working in international environment Self-development New challenges	Time consuming projects Lack of structured knowledge

Source: own elaboration.

The most profits can be identified for students. Thanks to participation in the projects based on the problem-based learning or design thinking,

students gain not only the ability to work in an interdisciplinary, randomly selected team, to analyse and synthesize, to adapt to new conditions, decision-making or self-assessment, but they also gain practical management skills. Participation in the projects creates opportunities for gaining knowledge and developing practical skills. It allows to develop independence and shape organizational skills.

Conclusions

The situation on the labour market as well as the development of the market of educational services in Poland and the development of new technologies cause changes in the offer and the quality of teaching. In order to increase the quality of the educational offer and the degree of satisfaction of students and employers, universities introduce new teaching methods and new didactic tools.

New didactic methods used at the Lodz University of Technology, especially at the International Faculty of Engineering (IFE), are consisting in solving specific practical problems by the participants of the educational process. The use of these new methods contributes to a significant enrichment of the nature of studying and education, by solving practical problems, shaping grades and judgments and working in a team. Through active engagements, these methods prepare students in a better way for future professional work.

According to Piotrowska (2015, pp. 1534–1538), both methods – PBL and Design Thinking – significantly support the development of key competences, such as creative thinking, reflective learning, adaptability, lifelong learning skills, effective work in groups, all of which are currently of vital importance. Implementation of various forms of problem-based learning is also an important tool in supporting the effective internationalization of Higher Education.

The research results also confirm positive evaluation of Problem-based learning and Design Thinking approaches by students and companies' representatives. However, the cooperation between university and

companies in the area of implementation of the innovative pedagogical approaches should be improved.

Thanks to changes made in the educational process, the students of Lodz University of Technology gain the skills to use knowledge acquired in the course of their studies in practice and develop organizational and interpersonal skills, so important in their future professional life of manager.

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