

HOW TO LEAD ECONOMICS AND BUSINESS STUDENTS TO CREATIVITY WITH MANAGERIAL SIMULATION GAMES?

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ABSTRACT

Each university should seek for suitable approaches to offering not only theoretical knowledge, but mainly practical skills and try to lead the students to creativity and innovative thinking in order to fulfil requirements from business practice. For business student's computer simulations are an effective educational tool as the games can simulate economic phenomena and conditions at the market and simultaneously record the consequences of realized student's decision-making.

Simulation games belong to active didactical techniques used in teaching business economics. Simulation games are considered to be teaching methods based on experiential learning. They enable to acquire knowledge and skills necessary for particular management activities through experience. During simulation students verify short-term, long-term and delayed effects of economic variables on a business and students mutually verify correctness of their decisions by achieved results. The paper is focused on determining whether simulation games used in teaching process at economic universities are popular, unpopular, useful or, unhelpful considering following study and occupation. For this purpose a research survey was carried out. Respondents were business students who passed course Managerial Simulation Game. This paper introduces survey results in terms of simulation games benefits from the students and teachers point of view.

Keywords: Managerial Simulation, Economics, Simulation Games Benefits.

INTRODUCTION

Changing conditions in entrepreneurial environment and at the same time speed of the changes lead universities focused on economics and business to look for following answers: Does contemporary university educational system prepare practice-ready graduates? What kind of new teaching methods to use in educational system? Is information delivery or knowledge construction fundamental for teaching process? Contemporary university teaching process is seemed to have weaknesses that lead to inability to respond quickly to changes in business practice and it results in increasing number of unemployed graduates that are not demanded in the labor market.

Substantial portion of education is based on information absorbing not on knowledge creation. However, Zelený (2011) declares that information is important, but passing. On the other hand, art of managing company is knowledge. The students don't learn how to manage a company only on the basis of acquired information in the form of instruction, approaches to management and leadership, but on the basis of own experiences that are connected with company management. Even commonly used case studies don't solve this problem in education, because their fundamental lies in the fact that students solve problems that have already been solved.

Regarding educational process, universities look for suitable approaches to learning basic notions, definitions, practical skills and leading students towards creativeness and

innovative thinking. Rohlíková & Vejvodová (2012) points out the need to move away from memorizing facts and acceptance of finished knowledge towards supporting an individual approach and the development of key competencies. Application of modern pedagogy based on constructivism is fundamental. While implementing constructivism a student acquires various theories, discussion follows and its output is critical rethinking of original view which leads to creation of own knowledge and attitudes.

University pedagogy should result from a student-centered learning and teaching and from experiential learning and at the same time reflect requirement from practice which can lead to easier adaptation in a labor market. Computer simulations, respectively managerial simulation games can take into account noticed aspects and fully confirm Komenský who came up with the idea of “schola ludus”, i.e., learn through play. For business students, computer simulations are an effective tool of teaching and learning supporting holistic view of problem solving. Simulations activate a teaching and learning process and provide a feedback between implemented activities of a student and his results.

Aim of the paper is to find out whether managerial simulation games are used in the university educational process of economic courses in the Czech Republic and what are the benefits for the students in the context of the future study and profession and for the teachers who actively moderate the whole process. Both sides' benefits will be determined on the basis of the research probe results gained at the chosen economic faculty after passing course Managerial simulation game where simulation games are used.

LITERATURE REVIEW AND MONITORING OF USING SIMULATION GAMES IN EDUCATIONAL PROCESS IN THE CZECH REPUBLIC

Discussion is focused on the issue of experiential learning, effective teaching tools and benefits of simulation games in education. Basic insights from simulation games used at universities and also in educational institutions are introduced in this part.

Literature Discussion

Dewey (1998) became one of the most famous proponents of hands-on learning or experiential education, which is related to, but not synonymous with experiential learning. Experiential learning represents learning based on own experience. On the basis of own experiences Lewin (1936) defined experiential learning cycle which helps to understand what is effective learning. Proposed cycle has four parts that still repeat: concrete experience – reflection – abstract conceptualization – active experimentation, etc.

Also Dewey (1998) advocated for an educational structure that strikes a balance between delivering knowledge while also taking into account the interests and experiences of the student. Dewey points out a relationship between experiences and effective education. Teaching method is more effective the more closed it is to real life that is why students should acquire:

- many active experiences,
- first-hand acquaintance,
- Experiences that enable to involve all senses.

Dewey (1998) argues that content must be presented in a way that allows the student to relate the information to prior experiences, thus deepening the connection with this new knowledge. Dale (1946) results from the theory of experiential education and determines relationship between implemented education method and education effectiveness (Figure 1).

People generally remember		Our involvement
90% of what they say and do	Real activity Experience simulation presentation	Active
70% of what they say and write	presentation discussion	Active
50% of what they hear and see	Watching presentation Watching video/film	Passive
30% of what they see	View of a picture	Passive
20% of what they here	Words hearing	Passive
10% of what they read	reading	Passive

Figure 1
EXPERIENTIAL EDUCATION

Figure 1 show that people can remember until 90% of what they say and do assuming their active involvement in activities related to real imitation of experiences and simulation presentation.

Idea of experiential learning inspired also Kolb (1984) so that he created model of experiential learning so called Kolb's learning cycle (Figure 2). Concrete experience of a student with himself and world is fundamental. Students perceive an experience, watch it, and think of it from various points of view.

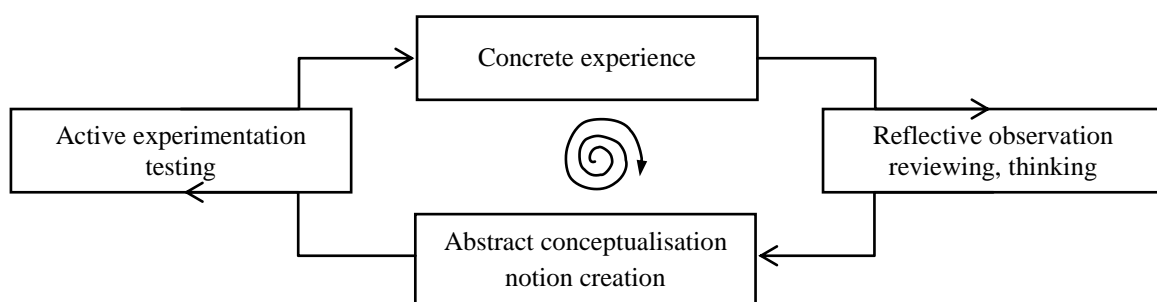


Figure 2
KOLB'S LEARNING CYCLE

Reflection result means conceptualization of a problem at abstract level, notions, hypotheses and theories creation. Active experimentation follows and brings a new experience; it is followed by reflection and so on. Process of student's knowledge creation is not linear, but cyclic, sometimes called never-ending learning spiral. Kolb's learning cycle is mostly used in the methodics emphasizing skills development. Experiential pedagogy results from it. Jarvis (Nehyba, 2011 & 2012) builds on this concept with his own concept of incompatibility. Incompatibility appears at the moment the people cannot react on a situation with the same way they have reacted till this time on the basis of their experiences. This incompatibility leads to need of gaining new experiences resulting in equilibrium on qualitatively higher level.

Concrete example of teaching method resulting from experiential learning and teaching is represented by simulation methods and games. Vašutová (2002) points out possibilities of simulation methods and games, which lie in playing roles in model and simulated situations on the basis of determined rules. Experiences lead to knowledge and skills acquiring so that they can be generalized. At the same time simulation games and methods enable playful character of the situation, that doesn't have confrontational nature as it is in real life. Result of an application of simulation methods and games for an individual is his insight into the solved problem and creating own attitude. An individual is moved from simple speaking to feelings and behavior.

Considering above mentioned facts about simulation games the games appears to be a suitable tool for economic phenomena and conditions simulation and that is why the games represent an effective tool for teaching supporting holistic approach to the problem solving (Aldrich, 2009; Mildeová, 2015).

Computer simulations activate an educational process, provide a feedback between realized activities of a student and his results, enable examination of economic system on a model and quite plausibly simulate running and results of economic processes. Simulation games and methods enable to involve a number of specifics of complex social systems, such as feedback, lag or non-linearity. Mentioned tools create interactive learning environments by which various experiments can be realized in real time unrealizable. Simulation games and methods are commonly used for What-if Analysis, testing impact of various scenarios and strategies etc. Managerial simulation games are very important for simulation of economic processes, managers' decision making under the specific conditions of entrepreneurial environment and concrete branch (seasonality and innovation intensity of concrete production, etc.) and at the same time mentioned games and methods register consequences of realized decisions in the form of achievements.

Managerial simulation games use word description as well as mathematical apparatus and during the process of decision-making intuition as well as exact solution (Rohlíková & Vejvodová, 2012; Tuleja, 2007; Vašutová, 2002). According to Peterková (2011) managerial simulation game used for economic processes simulation belong to active didactical techniques. Unlike passive didactical techniques (e.g. case studies) students that created virtual firms acquire an overview of an impact of realized changes in parameters influencing the whole market online respectively in shortened moment in time. (e.g. quarter in reality lasts three months but in computer environment can last 10 min). Moreover, students learn to communicate with the other team members; respectively they learn how to get a support from the team members for realization of their decision. While playing simulation game an important role belongs to game moderator (pedagogue), who provides theoretical introduction at the beginning of each round. The moderator points out decision-making parameters influencing final result, controls timing of a game and sets end of each round. The round is finished at the time all the students' teams set required economic parameters in a

simulation. After that the moderator evaluates concrete teams according to given criteria and comments achieved results of each virtual firm considering required index value.

In the course of managerial simulation game (Figure 3) student's knowledge competency is identified through transmission of the teams' experiences by the interaction among the team members as well as by interaction among the teams forming the relevant market.

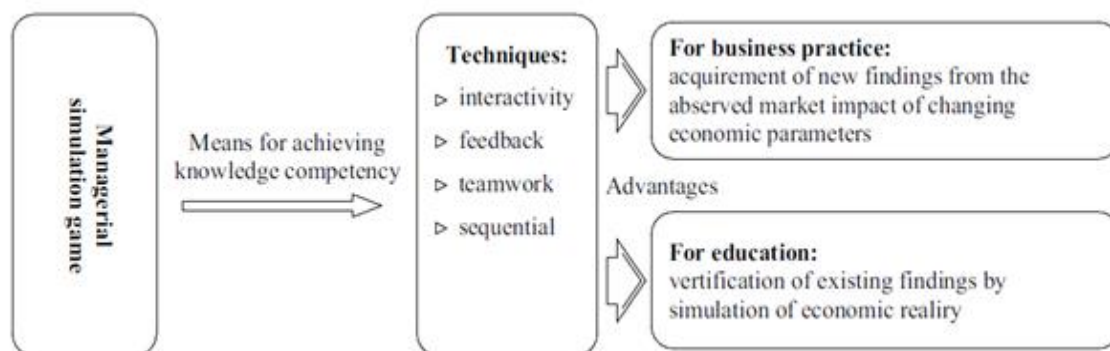


Figure 3
BENEFITS OF MANAGERIAL SIMULATION GAME

Figure 3 shows that using simulation game is useful for the students and their future study (verifying existing knowledge) and at the same time for the students' future occupation – new knowledge from realized decisions in simulated economic reality.

Using Managerial Simulation Games in Teaching Process under the Czech Conditions

Contemporary in the Czech Republic managerial simulation games have been used in teaching (mostly at the universities) but also in educational consulting firms. Existing managerial games can be divided into two groups:

- Managerial games that can be applied without any modification after loading in a computer system (e.g. MARKETPLACE, JA TITAN, CELEMI, etc.),
- Managerial games that are created by concrete institution (school, consulting and educational company) after buying software (e.g. VENSIM, ICECREAM, UNISIM, MARKET HERO, etc.).

Both groups of managerial simulation games have own specifics, which differ in the sphere of decision-making parameters (levels of decision-making) in graphical options (using graphs for decision-making), in chosen commodity and also in price.

At the Faculty of Economics, VSB – Technical university of Ostrava simulation games without any modification are used as well as those that are modified for simulation in a food industry. Simulations of logistics processes are also used there.

REALIZATION OF RESEARCH PROBE AND ITS EVALUATION

A research probe was realized for gathering information about benefits of managerial simulation games for education and business practice, concretely games used for university students of economic branches. The participants were undergraduates from the Faculty of Economics, VSB – Technical university of Ostrava, who passed course Managerial simulation game. Actually three managerial simulation games are used in this course. Used simulation games simulate business activities under the conditions of a food industry

(freezing plant – game ICE CREAM), technology production (JA TITAN) and electrical engineering (UNISIM).

Methodological Framework of Research Probe

After passing the course Managerial simulation game undergraduates found an electronic questionnaire in Learning Moodle System - full-time studies in May 2015 and part-time studies in April 2015.

Research sample involves 111 anonymous respondents. All the respondents studied Economics and Management (study program) in both forms: full-time (70) and part-time (41).

Used questionnaire was focused mainly on gathering information about significant benefits of managerial simulation game for the students, their further study and future occupation. Aim of the questionnaire was also to verify helpfulness of managerial simulation games for recognizing existing dependency between chosen economic variables and benefits of team working during the decision-making processes.

Experiences and ideas of the students were explored by opened-ended and closed-ended questions with the given multiple choice. Opened-ended questions gave the students an opportunity to express their opinions in a free-flowing manner, offering feedback for teacher.

Regarding qualitative character of the research probe, the results were determined as frequency of occurrence (in absolute terms and as a percentage) including graphical displays.

Knowledge Gained From Research Probe

From the results of research probe we gained the information about a perception of course Managerial simulation game, respectively popularity or unpopularity. Another required information was whether the course is considered to be beneficial for the future study or job of the students and what is the highest benefit of this course. Furthermore, the probe was focused on the question whether the simulation games used in the course enabled to recognize existing dependency of selected economic variables.

Research probe showed that the course is popular for 98% of our university students, low popular is for 2% of the students, nobody described the course as unpopular (Figure 4).

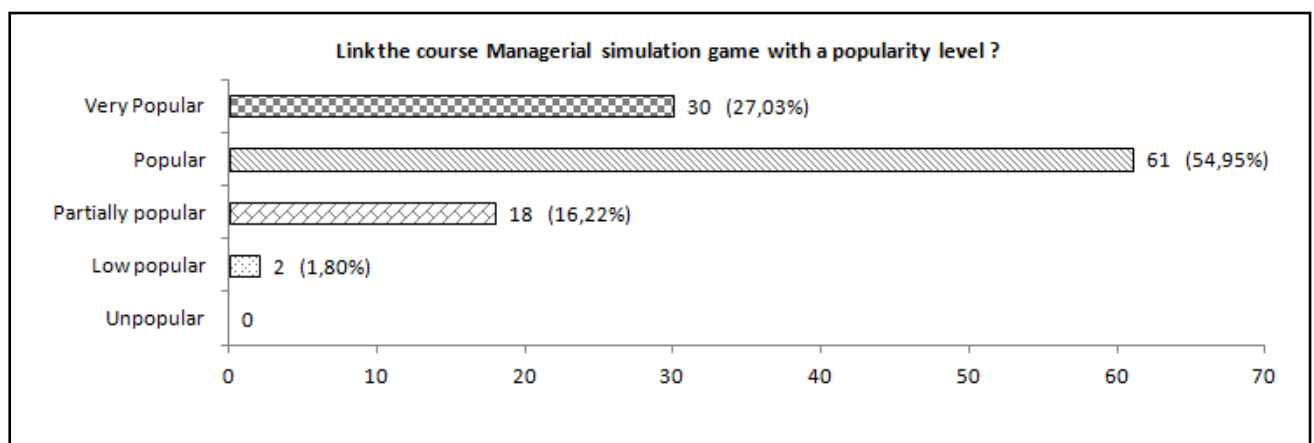


Figure 4
POPULARITY OF COURSE MANAGERIAL SIMULATION GAME

Significant differences were determined in the case of the benefits of the course for the future study and job. Students answered that Managerial simulation game is more beneficial for future study (94%) than for the future occupation (82%) (Figure 5).

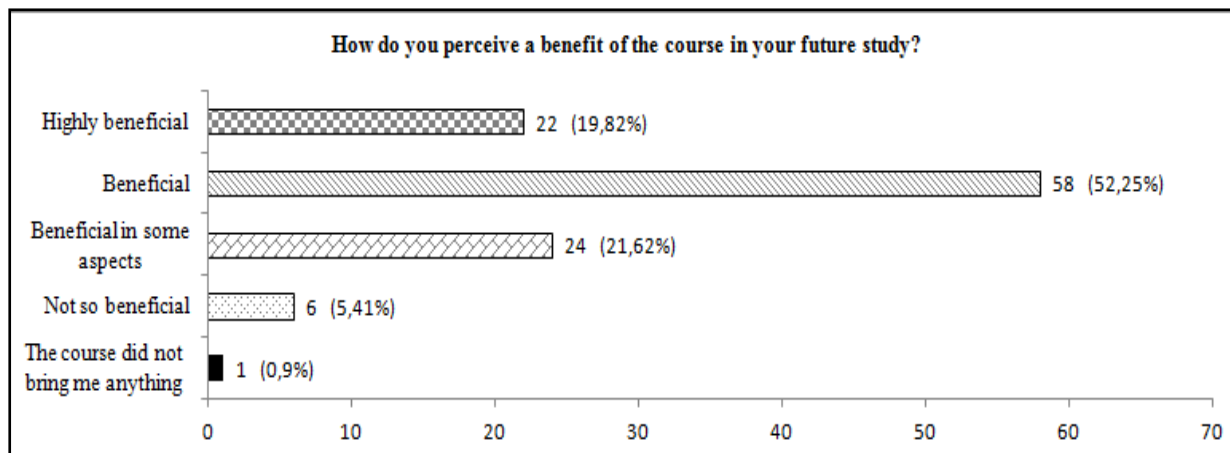


Figure 5
COURSE BENEFITS FOR FUTURE STUDY

On the other hand, one student doesn't see any benefit for his future study and four students don't find any benefit of the course for their future job (Figure 6).

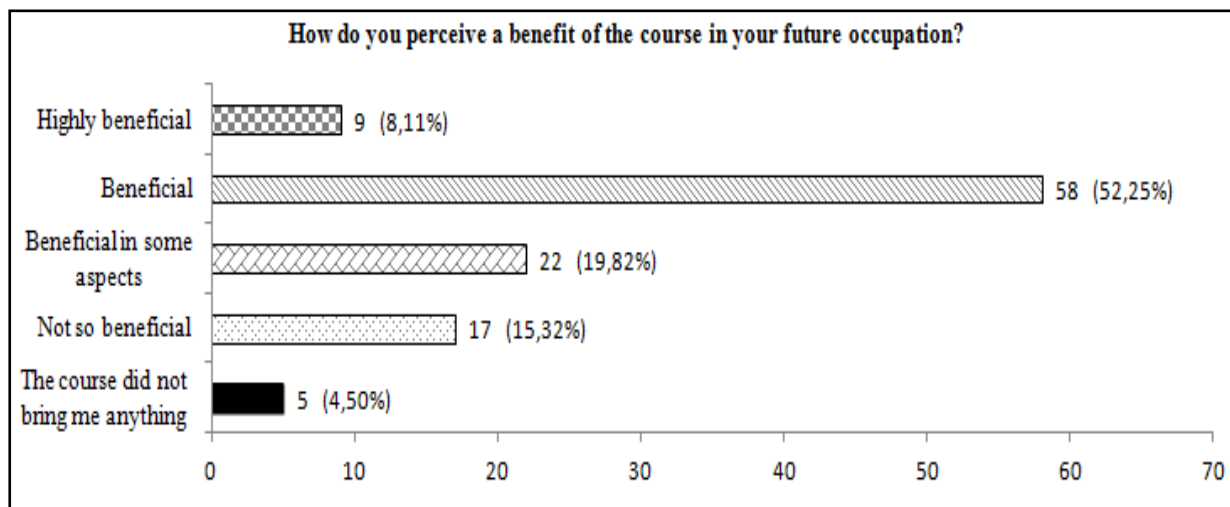


Figure 6
COURSE BENEFITS FOR FUTURE OCCUPATION

Lower perceived benefits of the course in a future job can be explained by the existence of the part-time students in research sample. These students don't work in business entities, but they are employed by offices of institution where gained experiences cannot be used in practice.

In this research probe, vast majority of students (94%) stated that simulation games used in the course enabled them to recognize existing dependency among selected economic variables (Figure 7). While playing simulation game ICE CREAM, students realized the impact of decision-making parameters (e.g. product price, choice of distribution channel, marketing activities, etc.) on result value of index Z-score. In the case of playing simulation game JA TITAN, students watched how decision-making parameters (e.g. utilization of

production capacity, amount of inventories, produced quantities, etc.) influence final result PI index. Simulation game UNISIM helped the students to perceive an impact of decision-making parameters (e.g. choice of the market, price of product, etc.).

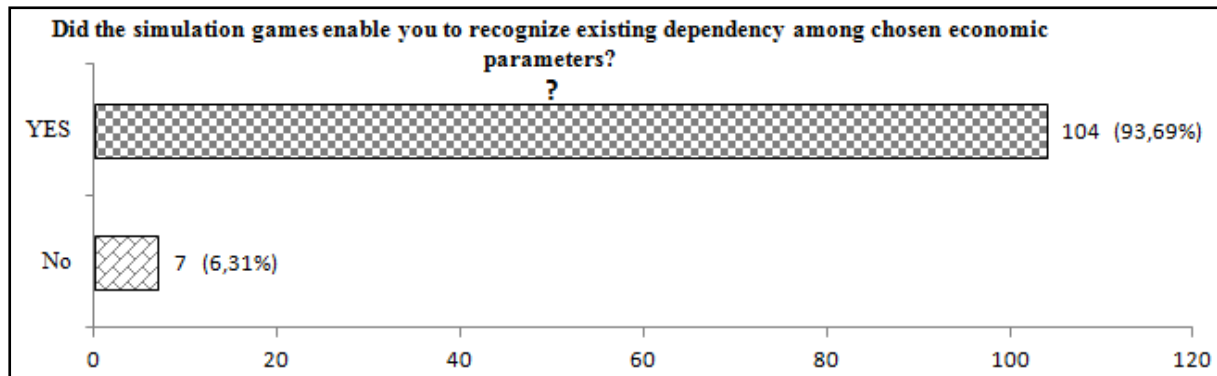


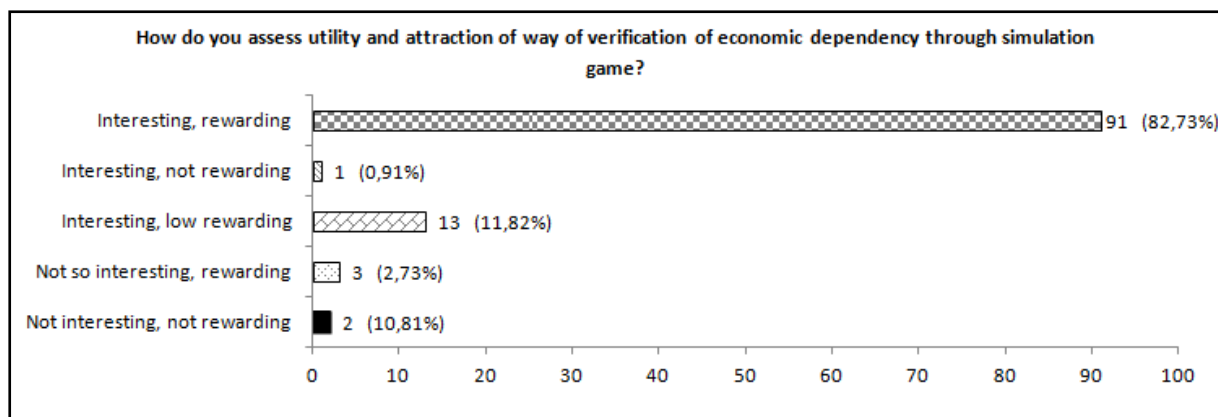
Figure 7

RECOGNIZING EXISTING DEPENDENCY AMONG CHOSEN ECONOMIC PARAMETERS

Deeper analysis of the questionnaires brought a great number of concrete reasons (answers) which clarified students' perception of gained benefits of playing simulation games. Table 1 brings the most frequent answers.

Table 1 WHAT ARE THE MOST IMPORTANT BENEFITS OF PLAYING SIMULATION GAMES FOR STUDENTS?
Comparison with classmates. Linking theory with practice. It's not just computing, but the strategy of how it should work well in real life.
The benefit for me is to gain new experiences. Find relationships among the different variables, and especially compared to other subjects, it is more practical.
I consider the most important benefit for my life. After a long time I could finally try out what and how it works, understand the principle of strategic thinking and learn to think like managers.
We tried how does it work in practice in the sphere of introduction of new products, we had to control the costs, how to perceive competitors etc. Till this time it hasn't done any book.
Application of financial statements in practice, only now I fully understand a function of Cash flow. Change from the theory to practice, to realization and using knowledge.
Learning teamwork, recognizing context of several varieties, delay effect, etc.

From stated answers provided by a sample of students (111) result, that the most significant benefit of managerial simulation games are gaining experiences from firm managing, understanding context of selected parameters, using financial statements and learning teamwork.

**Figure 8**

UTILITY AND ATTRACTION OF WAY OF VERIFICATION OF ECONOMIC DEPENDENCY THROUGH SIMULATION GAME

It was also verified how the students perceive utility and interest of way of verification of economic dependency through managerial simulation games (Figure 8).

A significant majority of students (83%) consider method of the verification of economic dependence through simulation games as interesting and rewarding. 12% of students finds the way of verification as interesting, but low rewarding. Simulation games are not interesting and not rewarding for 2 students.

CONCLUSION

Effective educational process at the universities focusing on economic and business sphere should provide not only theoretical base of knowledge, but also should teach the students how to work with gained knowledge and use them in business practice. Managerial simulation games used in educational process help to gain practical experiences from economics and business management. By entertaining game, that simulates concrete conditions at the market, students gain experiences in decision making such as about the product price, production quantity, marketing tools etc. Students also compete with the other students teams representing competitors in given branch. The aim is not only to beat the competitors, but also learn from mistakes which are the results of bad decision.

Simulation games support students' creative approach while solving various situations at the market. Realized decisions are based on economic calculations, but intuition or entrepreneurial spirit play an important role. Games are played in virtual environment with the use of computer which is rather attractive for contemporary student's generation.

Using simulation games bring benefits not only for the students, but also for teachers. During the game teachers have the role of moderator which means that they determine the conditions of the game such as decisions timing and theoretical background. Teaching based on gaining practical experiences through game makes the pedagogical process very interesting and entertaining. Teacher becomes a coach, who helps students to reach their educational goals.

The results obtained from the research probe confirm popularity and usefulness of simulation games. Most students believe that simulation games are beneficial for their further studies and future career (business practices).

From stated students answers result that way of verification economic parameters throughout simulation game is interesting and rewarding. The main principle of simulation games is to recognize economic laws of the market by using game.

Own experiences from using simulation games in university teaching and learning process confirm that managerial simulation games create interactive learning environments

for testing the impacts of various economic scenarios and strategies, at the same time represent effective education tool supporting holistic view of problem solving.

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