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## **MODERN EDUCATIONAL METHODS - GAMIFICATION AT SCHOOLS OF HIGHER EDUCATION IN POLAND**

### **Abstract:**

According to statistics, in recent years gamification has been listed as one of the most important trends. Among the gamification applications one should mention marketing, sales, recruiting, motivating, training and development of employees, health, personal development, education etc. The use of gamification in education brings with it enormous potential, increasingly often one talks today about it in the context of teaching at schools of higher education. This new approach to academic courses designing is used at Polish schools of higher education since 2012. The aim of the article is to introduce initiatives of gamification implementation in higher education in Poland and to examine whether the introduction of elements of games to courses of higher education may be attractive to students. The article presents the main assumptions of gamification and its most commonly used mechanisms. The authors present implemented gamification solutions, as well as the prospects of gamification in Polish schools of higher education. The article is enriched with the results of research conducted among the students of Czestochowa University of Technology on the state of their knowledge about gamification, the scale of interest in gamification mechanisms and finally their wish to take part in the gamified e-learning course.

### **Keywords:**

gamification, e-learning gamification, higher education, student

**JEL Classification:** A00, A20

## Introduction

One of education elements is e-learning. It is a tool for the inclusion of students group into the educational process, by creating conditions for the transmission of knowledge from places that are far away from the place of functioning. Polish schools of higher education, seeing the undeniable advantages, use modern technologies in the educational process (Sroka & Ptak, 2015, p. 132). Relatively new mechanism involving students is gamification, which allows to combine elements of effective learning, competition and fun. According to Gartner research, gamification is currently at the top of popularity so called curve of the life cycle of new technologies. Gamification (with systems of points, badges, tables of results, levels) aims to encourage participants of e-learning course to get more involved, more frequent look into the course and to regular competition. Through solutions of this type schools of higher education are seen as innovative, favoring interaction and modern tools of interpersonal communication, motivating students to be active by the rivalry, competition and fun (Uroda, 2014, p. 322). At schools of higher education all around the world, many gamified courses has already been performed, for instance led by Lee Sheldon - a pioneer of gamification from Indiana University, USA. There are also schools where courses are made up mainly on the basis of the game, for example Playmaker School in the USA or Efterscole in Denmark. The example of completely gamified school is Quest to Learn in the USA. Rather than attend traditional classes, students take the challenges out there, go on missions while they seek solutions to complex problems. At the end of waiting for their final encounter, called boss fight, in which they face extremely difficult task, they must use their knowledge and experience. In Poland, the Polish Association of Gaming Research has been implementing a research project on gamification in higher education. The university entering gamification ideas into teaching programs is Kozminski University, Warsaw, which uses more than 140 games at all levels of study, from the bachelor to MBA. Gamified courses were also conducted, among others, at the Kazimierz Wielki University in Bydgoszcz, Adam Mickiewicz University in Poznań and the Jagiellonian University in Krakow.

## Gamification - a new trend of the XXI century

The concept of gamification for the first time was used by Nick Pelling, in 2002, by this time it meant the activities which have already entered into the sphere of action games (role-playing and computer), which one wanted to adapt to other areas (Burke, 2014, p. 5). The leader of the global gamification thought, Gabe Zichermann, stated that gamification uses games and their mechanisms in situations that are not games, to engage users in solving problems (Zichermann & Linder 2010, p. 85). Social games designer Amy Jo Kim defines gamification as the use of games techniques which make an activity more engaging and fun (Kim, 2006, p. 28). Gamification designers achieve their goals by increasing the pleasure felt by the game participants, which is why the idea of its operation perfectly reflects the less formal definition, proposed by Paweł Tkaczyk "gamification is an injection of elements of fun to actions, which so far,

have caused no fun"(Tkaczyk, 2012, p.14). The essence of gamification is the use of game mechanisms in contexts unrelated to playing. In general terms gamification is an adoption of techniques and mechanisms used in computer games in other areas of life, that influence behavior by increasing motivation and engagement in an activity (Biela et al, 2013, p. 101). Gamification can be used as a support for concrete real problems solutions by changing attitudes, moods, and processes objectification (Osyra & Bajdor, 2015, p. 114). The assumption of gamification is the targeting of the participants actions for a specific purpose, in line with expectations of the project author and their mobilization to take appropriate actions, even if they are considered boring or routine.

Mechanisms taken from computer games began to be used by many organizations, often the largest companies in the world. The development of the idea of gamification becomes visible in different areas of the business, eg. to reward customers' loyalty (mBank), to awarding bonuses and employees rankings (IntraBase), quick preparation the new employees to their jobs (Live Ops call center), engaging employees to upgrade their qualifications (Gamfi), staff recruitment (Hays Poland), enhancing innovation (Idea Street). Gammified it is also health (Fitocracy), housekeeping (Chore Wars), city traffic (radar lottery, Sweden) etc.

Gamification can be not only a great motivator for action, having a positive impact on behavior, acquiring knowledge and developing skills. Gamification also enhances the innovative thinking and innovative action. Harvard Business Review mentioned gamification as one of the most important trends of 2011. Gamification placed on 2nd place in the „10 e-learning trends for 2016” ranking (Aurion Learning, 2015). According to Gartner, by 2015, 50% of companies that manage research and innovation were using gamification to enhance innovative thinking among its employees (Grywalizacja24, 2013).

Games primarily teach decision-making and awareness that every move has its consequences. Players make decisions looking holistically, depending on the overall, after the analysis of available information on the basis of what they have and what they know. Summing the game teaches problem and systemic thinking. Steinkuehler notes one more remarkable aspect of educational games: players reveal their identity. Finding the answer to who you are is probably the best lesson for human (Grywalizacja24, 2014). Among the five mechanisms most commonly used in gamification one should mention (Kosiuczenko et al, 2015, p. 14):

- points are virtual prizes assigned to complete various tasks and allowing the player (system user) estimate possible courses of action (by varying by the game designer / system size of awards vested point for different types of activities),
- badges confirm the performance of the player's important to achieve the objective or particularly difficult tasks; their set creates a kind of historical description of the player (system user), shaping his reputation in the community (in well-designed systems players representing different approaches will gain a different set of badges),

- levels are recording, exceeding by the player (system user), relevant development thresholds; achievement by the player a higher level usually unlocks access to the next pool of tasks,
- rankings are very often used, eg. when creating lists of experts from the field, or people who are particularly involved in a certain activity. Thanks to them the hierarchy in the group is easily demonstrated, and the player - assessed whether by the manager ("master of the game"), whether by co-workers ("fellow players") - can both promote and fall on lower positions,
- challenges / missions are activities that typically require interaction of groups, which combine competitive and collaborative elements.

### **Gamification at schools of higher education**

It is nothing new to say that learning through play is the most effective form of learning. When we begin to treat it as a fun, we start to approach it with greater commitment, everything becomes easier and more interesting, even learning very difficult things comes to us with greater simplicity. Use of gamification mechanisms in e-learning courses is designed to teach and support the process of memory effectively by combining their knowledge with the fun experience. A very important issue, which involves the introduction gamification to teaching is to encourage students to gain practical knowledge on their own. A study conducted on a group of university students participating in gamified courses showed that after using gamification in science, they remembered about 40% more information than after the traditional classes (Grywalizacja<sup>24</sup>, 2014). In an educational context, gamification is based on the design of the teaching process and methods of measurement and evaluation of educational effects, to create a learning environment acting like the game and encouraging to gamified/strategic approach. It has to offer students the long- and short-term goals, clear rules of action, rules of results evaluation and rapid feedback mechanism on progress made (preferably immediate). Above all, this system must enable a choice between different options, allowing for scaling of the difficulty level to the level of skills and to develop their own strategy in achieving educational goals (Mochocki, 2012). By participating in games, students can acquire knowledge, develop specific skills and develop desirable attitudes and behaviors. Gamification can also help to motivate them and reduce the number of people giving up learning before finishing education at school of higher education. This is particularly important in the case of education in the form of e-learning, where there is an element of loneliness of the student learning, in front of the computer and having difficulty replacing traditional learning environment with real meetings, with the virtual world. Games used in education allow students to enjoy their time at the computer, supporting their engagement and interactivity. Elements of participation are the challenge for the participants. Games can also support teachers in managing, maintaining, and strengthening relationships in groups of students (Margulis, 2005, p. 83).

## **Gamification solutions at polish schools of higher education**

Selected gamification solutions, which were conducted at polish schools of higher education are presented below.

### *The game course at Jagiellonian University, Krakow.*

The aim of the course was to examine, if there is a difference between the efficiency of the gamified and traditional course.

At the beginning of the course, each student was asked to select an avatar and name, which has been used till the end of the semester. Student's virtual alter ego was described by: knowledge charisma and experience. Each participant started the course with 10 points. During the course it could not exceed the limit of 100 points. The result of 60, 75 or 90 points respectively brings in obtaining brown, silver or gold badges within the given attribute. The player gets knowledge points for different tasks e.g. for practice tests from the literature, experience points for the presence in workshops, research or presentations, and points of charisma for projects. To get completion of the course, student has to earn at least one bronze, one silver and one golden badge in various dimensions of the chosen character development. The authors designed the course also to give an opportunity to gain additional rewards. These additional rewards are e.g. symbolic badge received achievements, like "Early Bird" for the appearance at the first class, or "Daredevil" for declaration for the individual project as first. Each student has an access to the current state of points through a dedicated website (Prokopowicz & Żmuda, 2011).

Conclusion. The authors of the experiment did not observe a significant difference between the students satisfaction that comes from participation in both courses. In addition, it turned out, that gamified rules are seen as less readable from rules of traditional courses.

### *The game course at Uniwersytet Kazimierza Wielkiego, Bydgoszcz.*

The aim of the course was to encourage students to attend optional lectures and motivate them to work regularly throughout the semester, which is not required during the standard mode.

The course ended with an exam at the end of the semester. The current course content has not been modified, only the rules of passing the subject were modified. Students had a choice - they could give up 'fun' and be among the subject in standard mode, they could also chose a new concept and study under new rules. In the second option the exam at the end of the semester was replaced by the weekly tasks to perform. These tasks were divided according to the degree of difficulty, the higher, the more points was to earn. The student was to solve at least one arbitrarily selected task in each set. At the beginning of the semester each student received three lives, attempt of fraud or lack of the task solution resulted in losing a life. Students, who have lost six lives, automatically did not pass the course. In addition to standard tasks also additional ones appeared, they were more demanding and compelling creative

thinking, but to be able to measure them, one should first do the obligatory part. Solving some tasks allowed to regenerate lost life, as well as completing all standard tasks, available in a given week. For each presence at the lecture student received 1 point. During the course the student could earn up to 100 points and accumulated points were clearly converted into the grade. For passing the subject it was required to get at least 30 points. An additional condition was to have at least one life at the end of the semester. Individuals who did not collect the required number of points, or had less than one life (but more than -3) could take the exam, so as to fight for the completion of the course. To course management were used mainly the Google Docs and Google Forms, having the flexibility to implement rules designed (Sobociński, 2013)

Conclusion. Gamification encouraged more than 60 percent of the students to work systematically during the semester, compared with 10 percent of the whole, not working regularly within the framework of the traditional lectures. In addition, students presence on optional classes significantly increased.

### **Research methodology and research results**

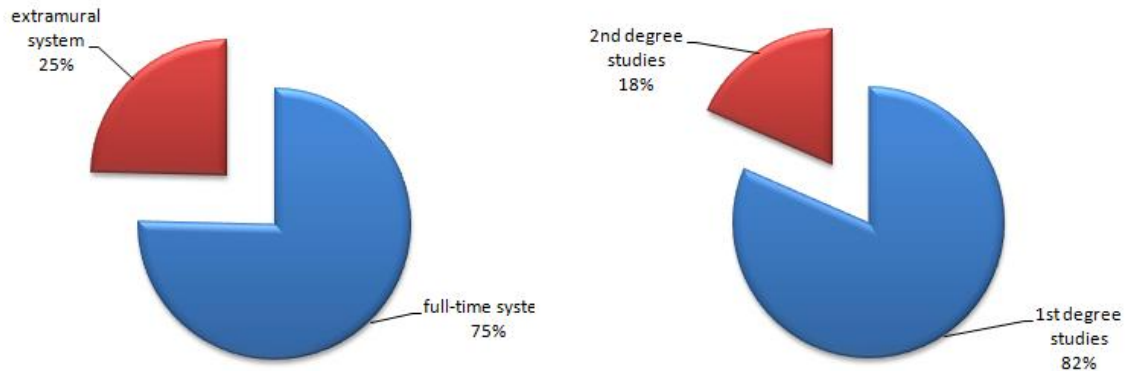
Faculty of Management, in which the survey was conducted, is the most developed faculty of the Czestochowa University of Technology in the aspect of e-learning. On the many fields of study on the faculty, each semester there are e-learning courses, organized for both full-time and part-time students.

The main goal of the survey was to define the level of knowledge of participants/students on the use of gamification mechanisms in courses, and determine whether they would be interested in participating in the gamified course.

The survey was conducted on a group of  $n = 195$  students of three fields of study at the age of 21 to 48 years. They were students of 1<sup>st</sup> degree studies (159 respondents) and 2<sup>nd</sup> degree studies (36 respondents), studying in full-time (147 respondents) and part-time (48 respondents). It was a one-off survey, it involved 141 women and 54 men. The questionnaire had a form of paper, and it was handed over to fill the respondents in the classroom, all the survey questions were closed questions of a single choice. Entire groups were surveyed, all of questionnaires were filled out correctly, all respondents previously took part in more than two e-learning courses.

Figure 1 shows the percentage of respondents' form of study, and the studies degree.

**Figure 1: The percentage of respondents form of study and the studies degree.**

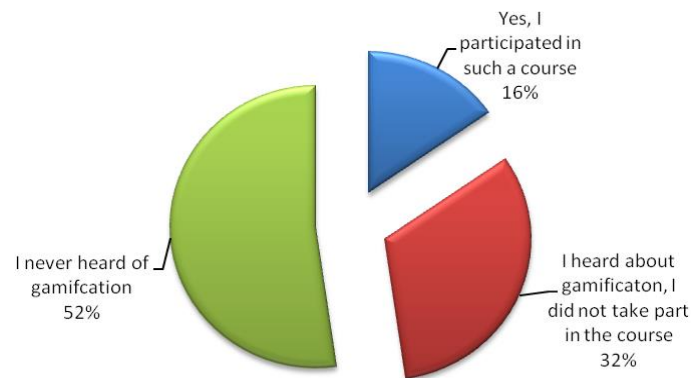


*Source: Authors' own elaboration*

As shown in Figure 1, the highest percentage of respondents were full-time students, first-degree (75 percent and 82 percent). 25 percent of respondents were part-time students, and 18 percent of the respondents were students of the second degree studies.

The condition of entering the study was the participation in at least two courses conducted in the form of e-learning course. Such a condition was aimed at selecting people who have experience in participating in e-learning courses and on the basis of their experience are able to determine whether the introduction of gamification mechanisms to e-learning course can be attractive in terms of acquisition knowledge and learning. The first point of the survey was to give an answer to the question of whether the students have ever met, while participating in e-learning course, elements of games. It turned out that many of the respondents before the survey have never heard of the concept of gamification. So that they could comment on another question, we asked them to refer to the annex attached to the questionnaire. The mentioned annex contained general information about gamification (definitions, general assumptions), the characteristics of the exemplary gaming platforms and a brief description of an exemplary course functioning in the framework of the gamification mechanisms.

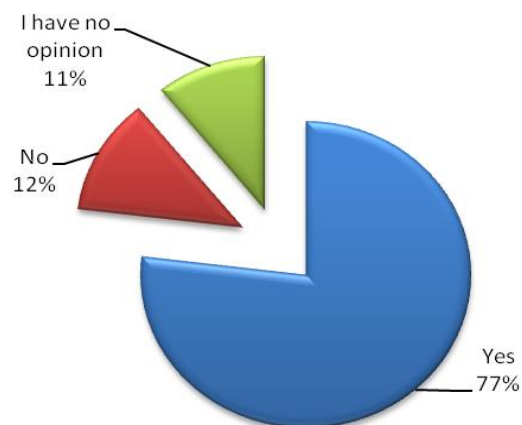
Figure 2 shows the graphical presentation of answers to the first question of the questionnaire on students' awareness of the gaming mechanisms in the context of learning.

**Figure 2: Have you ever met the mechanisms of gamification in the course?**

Source: Authors' own elaboration

As can be seen in figure 2, only 16 percent respondents (31 students) participated in a gamified course. On the one hand, this is a fairly weak result, but taking into account the fact that gamification entered the Polish academic courses relatively recently, one may be tempted to say that this is a promising result. 62 students (32 percent) heard about gamification, but never participated in such a course. The largest part of the respondents, as many as 52 percent (102 surveyed people) never heard of gamification – so that this group of students could answer next questions, the annex with information on gamification and gaming mechanisms in academic courses has been prepared.

Figure 3 shows the graphical representation of answers to the next question in the questionnaire on students' interest in participating in the gamified course.

**Figure 3: Would you be interested in participating in a course designed to use the games mechanisms?**

Source: Authors' own elaboration

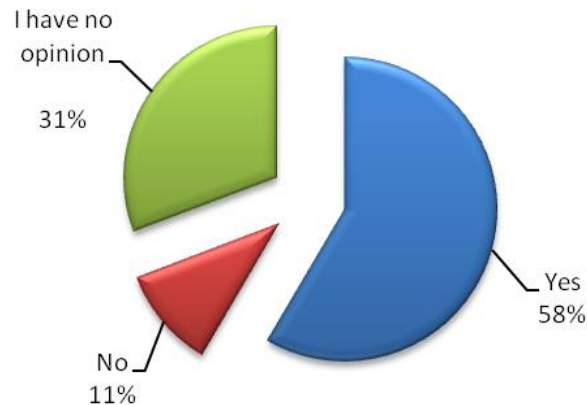
As shown in Figure 3, 77 percent of the respondents (150 students) are interested in participating in the course using games mechanisms. Of no opinion is 11 percent of



respondents (22 students), lack of desire to participate in the gamified course stated 23 students – 12 percent of respondents.

Figure 4 shows the graphical representation regarding the responses to the question on students' opinions about whether gamified rules of the course would be more readable than the rules of traditional courses

**Figure 4: Do you think that the gamified rules would be more clear for you than the rules of courses in which you have participated so far?**



*Source: Authors' own elaboration*

As shown in Figure 4, 58 percent of respondents (113 students) are of the opinion, that gamified rules of e-learning courses are more readable than rules of courses, in which they previously participated in. 31 percent of respondents have no opinion on this matter (60 students), 22 students – 11 percent of respondents do not believe that rules of courses based on the mechanisms of games are more legible than other courses.

Figure 5 shows the graphical representation of the survey question regarding students' opinions about whether the use of gamification mechanisms in e-learning courses (challenges/missions, levels, earn points, badges, etc.) encourage students to be more active in the course.

**Figure 5: Would the use of gamification mechanisms in e-learning courses encourage you to be more active in the course?**

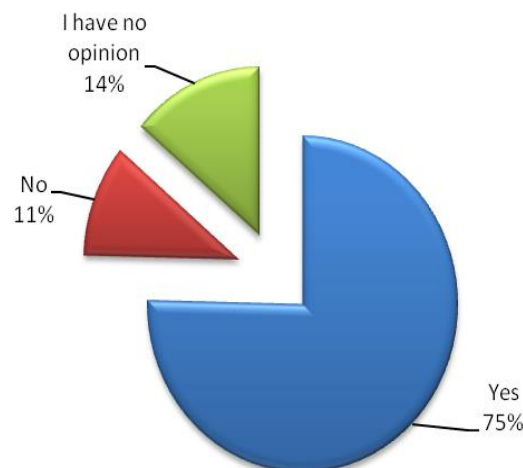


*Source: Authors' own elaboration*

As is apparent from Figure 5, 68 percent of students (132 respondents) are of the opinion, that the games mechanisms would encourage them to increase their activity in the course. Of no opinion is 21 percent of respondents (41 students), lack of desire to participate in the gamified course stated 22 students – 11 percent of respondents.

Figure 6 shows the graphical presentation of answers relating to the fifth question of the questionnaire to determine whether the students would feel motivated to expand their knowledge by participating in the gamified e-learning course.

**Figure 6: Do you think that the course conducted with the use of games mechanisms would be a better/more interesting solution conducive to knowledge acquiring, than previous courses, in which you have participated?**



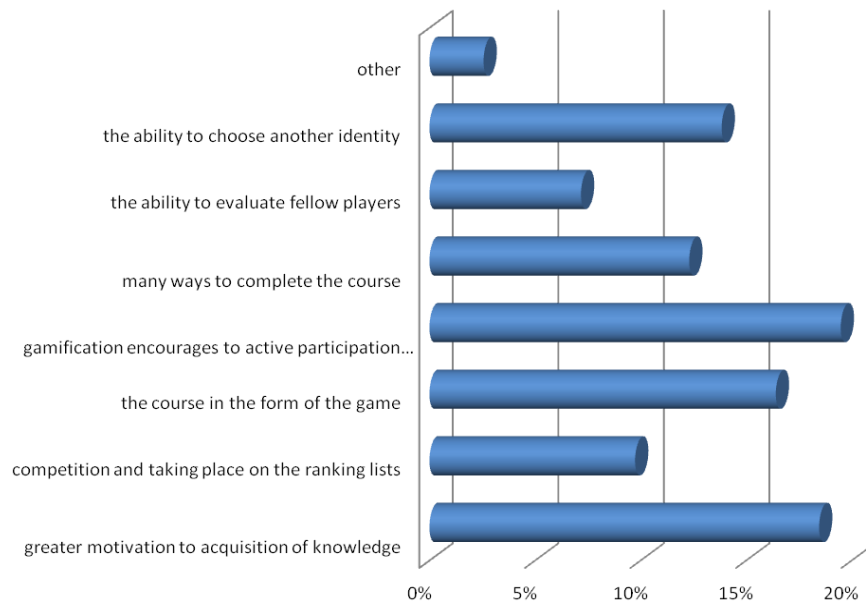
*Source: Authors' own elaboration*

As shown in Figure 6, 75 percent of respondents (146 students) believe, that gamified course would be more interesting than traditional e-learning course, it could positively contribute to the desire to expand their knowledge in the particular subject, they would

feel motivated to greater work and involvement in the acquisition of knowledge. Of no opinion is 14 percent of respondents (27 students), 11 percent (22 students) think the game courses would not be more interesting than the courses they have been participating in.

Figure 7 shows graphic illustration of the sixth, the last survey question. In this question, respondents were asked to try to determine, on the basis of the already possessed knowledge concerning gamification and gamified courses (necessary information has been presented in the annex attached to the questionnaire), which element of the gamified course in their opinion, would constitute its biggest advantage.

**Figure 7: What in your opinion is the biggest advantage of the gamified course?**



Source: Authors' own elaboration

As shown in Figure 7, as the biggest advantage of the gamified course students chose "encouraging to active participation in the course" (19 percent of respondents, 38 students). As the next big advantages of the gamified course, students chose: "greater motivation to acquisition of knowledge" (18 percent of respondents, 36 students) and "the course in the form of the game", which is interesting, different from traditional courses (16 percent of respondents, 32 students). As the less attractive features, respondents chose: "the ability to evaluate fellow players" (7 percent of respondents, 14 students) and "competition along with taking place on the ranking lists" (10 percent of respondents, 19 students).

## Conclusions

More widespread interest in using gamification in e-learning results from its potential in terms of awakening motivation and increasing its involvement in science. Designing effective gamification course requires detailed knowledge about the future players, defining for them effective motivators, and their skillful use to achieve clearly defined goals. Gamified courses at Polish schools of higher education are not the common

practice. Analyzes show, that in the Polish realities we deal only with the courses at the micro level - teachers gamify their individual courses. In Poland people approach to the game with less enthusiasm than, for instance, in the USA, many Polish young women do not identify as players. Unfortunately, there is a large reluctance of academic teachers to increase the time for teaching, because this would mean reducing their time for research and publications. Analyzes also show, that the big downside is the technological backwardness of many schools of higher education, lecturers and also students (Mochocki, 2012, p. 49). Research conducted at the Czestochowa University of Technology have indicated students' strong interest in courses based on games methods. Most of the respondents expressed their willingness to participate in the gamified course, believing that this kind of activities could contribute to their greater motivation to gain knowledge and an increased willingness to participate in the course in the active way.

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