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GAMIFICATION IN HIGHER EDUCATION: EXPERIENCE OF POLAND AND UKRAINE

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Open access to modern information technologies generates a new type of society that increases the productivity and competitiveness of any country in the world market and requires significant changes in the education system. One of the most innovative approaches in education is gamification of learning which has considerable capabilities to increase students' enjoyment, interest and engagement in the study. In this regard, the aim of our research is to analyse the use of gamification in higher education institutions of Poland, Ukraine and to study the effectiveness of using Kahoot as one of gamification technologies in teaching English for specific purposes (ESP) to students in a technical university. As shown by the results of the study, Poland has considerable experience in the use of computer games in higher education, whereas Ukraine is only beginning to implement these technologies in learning. An experimental study of the use of Kahoot platform in ESP classes at university level, which employed the methods of testing, observation and questioning, showed the effectiveness and expediency of this technology, as the students demonstrated a higher achievement rate, more active engagement and deeper motivation for learning.

Keywords: gamification; motivation university students; Kahoot; Poland; Ukraine; ESP.

Introduction

Open access to modern information technologies generates a new type of society that increases the productivity and competitiveness of any country in the world market and requires significant changes in the education system. In recent years, one of the priority areas of IT development is gamification, particularly, its implementation in the education sector through the improvement of existing educational platforms and the creation of new game-based learning programmes for use in an open information and education environment. Gamification has become an integral modern tool of education in the 21st century which can be used by teachers in the classroom, serve as a means of enhancing motivation and engaging students to learning. Thus the study of the possibilities that this technology opens in the learning process is of considerable interest in the field of education.

In this regard, the aim of our research is to analyse the use of gamification in higher education institutions of Poland, Ukraine and to study the effectiveness of using Kahoot as one of gamification technologies in teaching English for specific purposes (ESP) to technical university students.

Theoretical framework

In recent years the gamification industry is intensively growing and developing as also finding new fields for implementation of its products. Gamification services are distributed in a variety of spheres, especially entertainment, retail, manufacture, media, publishing. In the last decade, this innovative technology has been implemented in education with the aim to increase the participation of students in classroom activities, make the learning process more attractive to learners. The term “gamification” means the use of dynamic and game mechanics to engage people in a system. It is also defined as the use of elements of video games outside the context of the games (Deterding, 2011); Gamification is a manifold social-technological phenomenon with considerable potential to provide a multitude of benefits such as enjoyment and social interaction (Deterding, 2011).

The technical components of games are feedback system – scores, social networks, comments, etc. (Hamari & Koivisto, 2015), – rules, aims, and interface. Zichermann, as cited by Giang (2013), argues that the use of game technologies improves the abilities to learn new skills by 40%.

Gamification is not directly associated with knowledge and skills. It influences students' behaviour, increases their commitment and motivation and thus can lead to improvement of knowledge and skills (Hsin-Yuan Huang & Soman, 2013). It is notable that prizes, loyalty programmes and elements of game patterns have been used in business for a long time, but from the scientific perspective the gamification method was first viewed only in 2010 in the United States of America (Zichermann & Linder, 2010).

Studying the use of gamification in higher education of different countries we paid particular attention to the successful experience of Polish universities which can be useful in the development of this trend in Ukraine. In Poland, gamification has different names: *gamifikacja*, *gryfikacja*, *grywalizacja*. Nevertheless, elements of gamification appeared at Polish universities much earlier. Some academics, especially at economics colleges, organised market games that simulated the behaviour of business units. Others introduced elements of gamification into the evaluation systems in their classes. In the recent few years, however, a wider use of gamification at universities can be assumed as a factor which contributed to further commercialization of the product by enterprises. The market of customers as well as producers is quickly expanding. The most well-known company that produces computer games in Poland is CD Projekt Red. The company debuted in 2007 with the game *Wiedźmin* (Eng. *The Witcher*) which turned out to be a success not only in the country, but also abroad. The game collected very good reviews and a number of awards (Juszczak, 2017). Board games also experience renaissance since their sales have been growing rapidly in recent years. The market of this type of games is worth about 100 million USD and grows by approximately 15 – 20% a year. This context has made the conditions for creating learning games in Poland favourable.

A good example of professionally created didactic game is *Coffee Noir*, which was produced by Doji Educational Innovations – a company associated with the Poznań University of Economics. The game combines economic strategy, crime novels and comic visuals. The new version has an intriguing storyline, enlivened interface, enhanced with new audio-visual materials and investigation mechanics. *Coffee Noir* was initially developed as a serious game for learning purposes and targeted primarily higher and corporate education. However, due to many positive feedbacks from the players and the prizes obtained at video games fairs, the creators decided to expand the project.

Gamification has not only become part of higher education, but also an important element of corporate education. Since both of these spheres are seeking for ways to improve the quality of professional training they are trying to establish closer links with each other (Lytovchenko, 2016). Companies design newer and more interesting formats of games to train their employees and develop their professional skills. One of such examples is Red Bull program. The plot is related to aerobatics demonstrations. The participants are sales representatives and the purpose of the game is to increase the involvement of sales representatives in work through play. There are many initiatives of this type in Poland and they are becoming more and more sophisticated.

At present there are platforms which can be easily integrated into the education process by the creation on their basis of interactive games, quests and quizzes: Socrative, Kahoot, FlipQuiz, Duolingo, Ribbon Hero, ClassDojo, Goalbook etc. Kahoot platform, used as a service to create online quizzes, tests and surveys, is particularly popular in educational institutions. Students can answer questions created by the teacher using tablets, laptops, smartphones, that is, any devices that have access to the Internet. Tasks created on this platform allow including photos and videos. The tempo of performing the tasks is regulated by setting a time limit for each question. If necessary, the teacher can award bonus scores for correct answers and speed. All answers are displayed on the computer monitor. To participate in the quiz, students simply have to open the service and enter the PIN provided by the teacher from his/her computer.

In recent years, IT companies in Ukraine are actively working to improve existing educational platforms and create new game-based educational programmes for use in an open information and education environment. Currently, the most popular in Ukraine are Classcraft, Minecraft: Education Edition, Power Point Quick Starter, Paint 3D, LinguaLeo, Lego Education, WeDo 2.0., SimCity, etc. These products have become an extremely useful modern tool for teachers.

“Minecraft: Education Edition” platform is used in the Institute of Information Technologies and Learning Tools of the National Academy of Educational Sciences of Ukraine. It is a common universal educational platform used by teachers of different disciplines for the purpose of formation and development of the 21st-century skills, in particular, digital literacy, inventive and creative thinking, productivity of actions and effective communication of participants of the educational process. Teachers who actively use the “Minecraft: Education Edition” believe that this resource is excellent both for teachers and students (Konevshchynska, 2017).

Some Ukrainian universities, for example, Odessa National Polytechnic University, take part in the international project ERASMUS+KA2 “Cooperation between Universities and Enterprises in Game Industry

in Ukraine – GameHub”. The aim of the project is to combine different areas of professional training into a single educational process with the introduction of computer games into learning, taking into account the skills and interests of students, as well as providing young people with the knowledge and skills they need to find a job. In Odessa National Polytechnic University this project has been implemented in the study of computer science and the learning process at the Department of Atomic Power Plants. Within this project, each student creates a computer game in which simulates different situations, thus mastering the methodology of system analysis of physical protection systems (Maslov, 2018).

At Kyiv National Linguistic University, in the study of the English language, students use open platforms to create interactive games, quests and quizzes on their basis. For example, using Content Generator platform (<http://contentgenerator.net>) and selecting one of 15 templates, a teacher creates a series of interactive exercises and games for teaching vocabulary. The game is then placed on the Moodle platform, which is currently available at many higher education institutions in Ukraine, and used in learning. Games are predominantly based on questions of multiple choice, contain various types of prompts (sometimes wrong) and levels based on a storyline chosen by the author. The main task of the teacher is to create as many questions as possible in order to make the game interesting and diverse (Pasichnyk, 2018).

The University of Educational Management of the National Academy of Educational Sciences of Ukraine uses the MMORPG game, a computer network role-playing online game where a large number of players interact with one another in the virtual world. Participants in a team and under the guidance of the teacher perform tasks, and the teacher notes students' achievements in an online system. According to the results of the day, week, month, each student collects a set of achievements, which is an adequate assessment of his / her activities. The lesson can be built in the form of CTF (capture the flag) – a match where two teams compete trying to find a solution to a big task (Sergejeva, 2014).

In context of the analysis of gamification in higher education establishments of Ukraine, we would like to share the experience of Kahoot application in teaching ESP at the National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”.

Methods

In order to study the effectiveness of the use of gamification in the educational process, we conducted an experiment in which 43 second year students of the Instrument Building Faculty of the National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” took part.

The students were divided into a control group (21 students) who studied the traditional programme and an experimental group (22 students) who were taught with the use of Kahoot platform in ESP classes.

The main methods of experimental work were:

- testing, which was used to test students' language skills before and after using Kahoot platform;
- observation which helped to collect information;
- questioning which included open questions which had to be answered by students.

The experiment consisted of two stages. At the first stage, which was aimed to experimentally verify the effectiveness of Kahoot, a diagnosis of the level of formation of certain language skills in the control and experimental groups before and after the use of this technology was conducted. In the experimental group, Kahoot was used to study lexical (Information Technology Engineering, History of Engineering) and grammatical (Passive Voice, Conditionals) topics. In the control group, when studying the same topics, traditional methods were used which were not based on Kahoot platform. To check the students' level of relevant lexical and grammatical skills the same test was given before and after learning the above topics in the control and experimental groups.

The second stage, aimed at identifying students' attitudes towards using Kahoot technology, involved questioning students. They had to answer two questions in writing:

1. What particularly did you like about using Kahoot platform in ESP classes?
2. What difficulties did you have in learning with the use of this technology?

Results

Data obtained from the results of the testing showed that at the beginning of the experiment, the levels of formation of relevant lexical and grammatical skills in the control and experimental groups were almost the same. After the students of the experimental group performed the tasks using Kahoot platform, their levels of these skills formation increased significantly compared with the students of the control group. The overall results were summarised in Table 1.

Table 1

The Effectiveness of Kahoot Application

Levels of skills	Control group		Experimental group	
	Number of persons	%	Number of persons	%
Before the use of Kahoot				
Low	7	33%	8	36%
Sufficient	10	48%	11	50%
High	4	19%	3	14%
After the use of Kahoot				
Low	6	29%	1	5%
Sufficient	13	62%	16	73%
High	2	10%	5	23%

As can be seen from the table, only 1 (5%) student of the experimental group showed a low level of achievement, while in the control group there were 6 (29%) such students. In the experimental group, if compared with the control group, a greater number of students had a sufficient level of formation of the relevant skills (16 (73%) vs 13 (57%), respectively). It is indicative that high level after the completion of the experiment was achieved by 5 (23%) students of the experimental group and only 2 (10%) students of the control group. Thus, the results of the experiment showed a better dynamics of the relevant lexical and grammatical skills development in the experimental group than in the control group, which in our opinion shows the effectiveness and feasibility of using Kahoot platform in teaching ESP to technical university students.

The second stage of the experiment showed that in answering the question “What exactly did you like about using Kahoot platform in ESP classes?” all the respondents found some positive aspects of this technology. Most (15) students noted that while performing the tasks they established very good relations with the teacher. Some of them (9) enjoyed the spirit of competition, the music which was played while they were answering the questions. Four students answered that studying in a form of game was very pleasant. Two students liked it because they could use gadgets. One student mentioned that the interface was very good and the tasks were easily perceived visually, since each shape had its own colour. Also, one student noticed that this type of activity made it possible to think in English. Students also offered to prepare tasks on Kahoot platform themselves.

Answering the question about the difficulties they encountered in using Kahoot seven students mentioned that they could not complete some tasks because the time limits were too small. Four students indicated that they were sometimes nervous doing the tasks, because they were afraid to lose in the competition. Five students indicated that they had problems with the Internet connection, which distracted them from work and sometimes did not allow them to complete the tasks. Two students answered that the tasks were not varied enough. One student said that he was sometimes confused by pictures on the monitor because, in his opinion, they did not match the questions properly.

We should also note that, quite unexpectedly, the best results in performing the tasks on Kahoot platform were always achieved by students who had rarely demonstrated initiative in class before and did not have the highest performance rates. From our point of view, this indicates a significant motivational impact of this technology and its effectiveness in active engagement of students in educational activities.

Discussion

This paper confirmed and added to the findings of other researchers on the use and features of gamification. We fully agree with Yap (2016), who in her paper on transforming conventional teaching classrooms into learner-centred, multimedia-mediated ones, pointed out that many lecturers are still using conventional teaching and that in such classrooms while the teacher is explaining the material and making notes on the board, students are surfing the Internet, some day-dreaming and some sleeping.

Our experience, as well as that of other scientists (Dominquez at al., 2013; Sera, & Wheeler, 2017; Dichev & Dicheva, 2017; Turan & Goktas, 2015) emphasises the effectiveness of gamification in the academic context, shows that games engender motivation, at the same time indicating that it is not always easy to achieve those effects, and an effort is required to design and implement a system, which would be able to fully motivate the students. Our research is also in line with those studies which are specifically

related to game based learning and gamification in higher education (Zarzyeka-Piskorz, 2016) and illustrated that the educational process becomes more engaging when learning incorporates any form of gamification.

We strongly agree with a recent study on Kahoot application by Wang and Lieberoth (2017), involving almost 600 students, which reiterated the benefits of using game-based platforms for learning. The authors reported that variation in the use of audio and competition element affected engagement, enjoyment and concentration. Kahoot's audio and music features affected classroom dynamics in a significant and positive way. In support of their observation and that of Leaning (2015) who similarly emphasised that the use of gamification does seem a useful activity, which increases students' interest and motivation at the prospect of winning, our study also showed strong positive effect of the spirit of competitiveness created by this technology on students' motivation and engagement. However, unlike these researches, we would also like to point out a negative impact which competition may produce, particularly, the feeling of stress and nervousness at times experienced by some of our respondents.

Finally, it is important to say that we completely agree with Thomas (2014) who recommended Kahoot for educators because it allows fast and easy access and is particularly convenient for the revision of content of previous lessons. Also, in spite of the limitation of our study which was focused on the use of Kahoot only for the development of lexical and grammatical language skills, the reflection on our experience gave us ground to support the arguments made by Bicen and Kocakoyun (2018) who considered gamification in a broader learning context and recommended it as applicable for various educational purposes and in various lessons because it helps students to learn the content more easily and have fun even when tackling with difficult material.

Conclusion

Based on the results of our study, we can conclude that gamification of different spheres of life has become a trend of the 21st century. One of the spheres, where it is implemented particularly rapidly, is education. Among the first countries to start using this technology in higher education was Poland. We believe that its positive experience may be useful for study and creative use in Ukraine, where the process of introducing computer games into the education sphere is just beginning. The use of one of gamification technologies – Kahoot platform – in teaching English for specific purposes to technical university students, according to the results of the experimental study, showed its effectiveness and expediency, as students demonstrated not only a higher level of achievement, but also more active engagement and deeper motivation for learning the language.

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