GAMIFICATION IN CONTEST OF HIGHER EDUCATION

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ABSTRACT
The increasing application of new technological innovations has a great impact on educational procedures at universities. Information systems that facilitate the learning process are increasingly being used. On the other hand, there is an obvious problem with today's generation of students in terms of increasing and retaining attention during teaching. In the modern digital world, students are spending more and more time "on the screens" of smartphones, tablets and laptops. Also, the growing influence of technology results in a shift from classic lectures to integrated digital learning environments. Due to these facts, it is necessary to offer students new learning concepts that will result in better learning outcomes. The concept of gamification is set as one of the solutions. Basically, the concept of gamification uses elements of games in "non-gaming" areas such as education, health, marketing, etc. The paper explains the key concepts and frameworks of gamification. The paper focuses on presenting the concept of gamification in the context of higher education primarily as one of the ways to improve the teaching process by using interactive techniques that meet the needs of today's generation of students.

Keywords: *gamification, higher education, information technology.*

1. INTRODUCTION

The development of technology has led to the emergence of new forms of teaching in higher education institutions. One example is e-learning. Nowadays, e-learning is becoming one of the key segments of the student learning experience in higher education. In addition to the many advantages that this form of teaching brings, there are several factors that can be considered disadvantages. The fact is that in the field of education there is often a lack of interest, indifference, and teacher-centered teaching that leads to poor performance and unsatisfactory outcomes of the educational process. It is possible to identify several factors that cause low levels of effectiveness, efficiency, satisfaction, and motivation of students in e-learning systems, some of which are:

- The use of inappropriate motivational techniques
- Projects that are not properly managed
- Frivolous understanding of the main stages of e-learning development
- Inadequate technical implementation of e-learning
- Inappropriate graphical interface, etc.

Therefore, it is necessary to find concepts that will eliminate or mitigate the shortcomings that were previously listed, and one of the ways is to introduce gamification in e-learning systems. Effective gamification can be applied to daily teaching with outstanding results. Lam, P., Tse, A. (2022). The definition of gamification can to some extent argue why it is such a suitable strategy for educational programs. In summary, gamification involves the use of game-based techniques, aesthetics, and mechanisms in a non-game environment, in this case e-learning, to initiate certain behavioral patterns that favor the learning process. The term gamification was first used in 2008, but became known in the wider phase in 2010. The nature of gamification is contained in innovations in different learning conditions, choices and rewards, aimed at spreading inspiration and achieving a higher level of cooperation. As for the meaning and concept of "gamification", there are several definitions that consider gamification in a wide range. Definitions have been supplemented and changed as the use of gamification has expanded. Nick Pelling (2011) originally described gamification as the application of an accelerated game-like user interface design to make electronic transactions enjoyable and fast. "The term was later expanded to emphasize the use of game elements (Zicherman and Cunningham, 2011; Zerherman and Cunningham, 2011; Burke, 2012; Werbach and Hunter, 2012; Nah et al, 2014) in the off-field context (Deterding et al., 2011; Werbach and Hunter, 2012; Burke, 2012; Huotari and Hamari, 2012. Nah et al., 2014.) In recent times, gamification has been defined as the application of typical elements of the game, such as scoring and competition, to other areas of activity. (Hamari et al., 2014· Morschheuser et al., 2017) Another definition of gamification is the use of mechanisms, aesthetics and ways of thinking used in action mobilization games and in problem solving and fostering player commitment (Kapp et al., 2014). As reported by Lee and Hammer (2011). With the development of gamification itself, its definition was supplemented, so the following definitions can be found by studying the following literature:

- „ the process of changing the user interface to make online transactions more fun and faster " Zicherman and Cunningham (2011.);
- „ the process of using logic and game mechanisms to engage / activate users " Deterding & sur. (2011.);
- „ the use of game design elements in non-game environments " Burke (2012.);
- „the use of game mechanics and game design techniques in environments other than games to design behavior, develop skills, or involve people in innovation " Werbach & Hunter (2012.);
- „the use of game design elements and techniques in non-game related situations " Huotari & Hamari (2012);
- „ the process of improving the service provided by the gaming experience to support overall value creation " Werbach (2014.);
- „ the process of adding game elements to the activity " Nah & dr. (2014.);
- „ application of game machines (eg points, rankings, etc.) in environments and activities not directly related to games " Lands & Bedard (2010.);

- „ a business strategy that applies game design techniques in non-game environments by promoting user behavior “ Marczewski (2013.);
- „ applying player media transfers to real-life influences, behavior, improving motivation, and increasing complexity “ Graham (2012.).

Gamification is essentially a phenomenon created by appropriate frameworks and finds application in information systems related to health, education and recreation, with the immediate goal of increasing the number of users. Gamification provides motivation for the user of the information system, analyzing and processing each environment and its effects on the user. The term gamification refers to the word game although in essence it is not just a game but a game with rules and a game of thought and engineering in a fun context for actively engaging and solving user problems.

2. GAMIFICATION CONTEXT

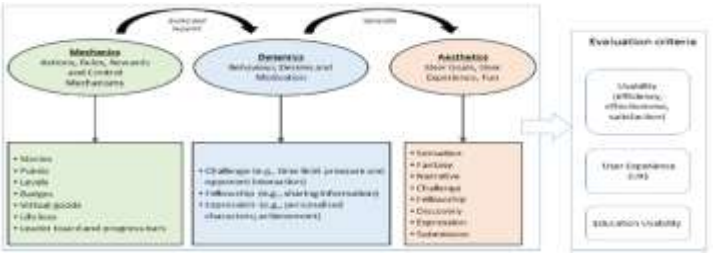
Gamification is not only used in games but also finds applications in the context of non-games:

- Internal stimulation: This is the process of increasing the productivity of employees in the company through its encouragement of innovation and interpersonal relationships of employees in the company, in order for the business to achieve its goals.
- External motivation: It is a process of customer participation for product design according to some of their guidelines in order to increase sales and improve the relationship of companies with their customers.
- Behavior change: It is used by non-profit organizations aimed at developing new habits for the benefit of people through actions such as promoting healthy eating, driving more carefully or redesigning lessons for more efficient learning and greater student engagement (Werbach and Hunter, 2012).

Simply put, gamification is the application of typical elements of a game (e.g., scoring, competing with others, rules of the game) to other areas of activity. Many businesses and companies use gamification without even realizing it (eg sales competition.)

3. GAMIFICATION COMPONENTS

Each gamification system is based on a set of rules so as to ensure its smooth operation and basic components such as the reward, scoring, and ranking system. These are a part of almost all gamification systems, viewed as individual elements or as a system as a whole. Some authors, such as Blohm and Leimeister (2013), list two main elements of gamification, ie dynamics, and mechanics, while most others, such as Zicherman and Cunningham (2011), add aesthetics to the game. Thus, the MDA (Mechanics, Dynamics and Aesthetics) framework of gamification was created, which is schematically shown in Scheme 1.



Scheme 1: MDA gamification framework

Source: Sholz, B., Raga, L., Baxter, G.: Design and Evaluation of a " Gamified " System for Improving Career Knowledge in Computing Sciences, The African Journal of Information and Communication, 2016.

- Mechanics: these are rules-driven structures and show similarities with mechanical structures in physics. When these two components come together then a complex structure is created that can, if necessary, be applied to many areas of life that do not have to be in the domain of the game. Mechanics itself is generally not visible but its effect can be felt and observed through interactions. Mechanics support dynamics.
- Dynamics: Dynamic structures are elements that characterize each type of game in a different way since the motivations of each game are different. To discriminate and categorize users into species known as exterminators, socialists, researchers, integrators are needed so that each personality type is treated differently. The role of dynamic structures requires that the

game gradually becomes more difficult and ultimately to maintain the interest of the user so that he does not get bored of the game as well as to prevent giving up the game.

- Aesthetics: The term aesthetics describes leisure and fun in the game, two components that are essential in the playfulness system. Everyone has a different way of playing games and that way brings the right results. These can be different ways:
    - feeling: it is an internal process that causes relaxation through fun;
    - imagination: in the case of this term the game looks like a story and its goal is to convince the user;
    - narration: the play takes on a different mentality because it is reminiscent of a differently complex story;
    - challenge: a key component that causes the user to overcome obstacles and continue playing;
    - cooperation: reveals the social role of the game;
    - discovery: with discovery and constant enthusiasm the user never enters the game routine;
    - expression: represents self-discovery through play;
    - Submission: achieves the user's entertainment during his free time.

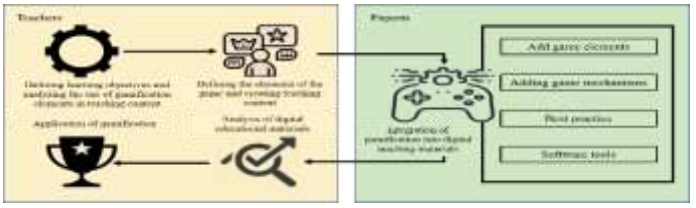
In order for the above-mentioned ways of entertainment in the game to be applied to the user, it is necessary to approach each type of user in a different way through appropriate mechanisms.

4. THE APPLICATION OF GAMIFICATION IN THE CONTEXT OF HIGHER EDUCATION

In the new and challenging context of the digital society of the twenty-first century, the labor market increasingly requires flexible, creative professionals with extensive experience in skills and competencies (van Laar et al. 2017). Higher education institutions must not ignore this tendency but must adapt to them in a way that introduces innovations into the teaching process that will enable the acquisition of new skills and competencies. One of the important innovations is gamification, for which many authors such as Subhash and Cudney (2018) point out that it has huge support for numerous benefits for both teaching staff and students. The implementation of gamification in education is a logical step because educational systems, including higher education systems, already contain many elements of gamification. Students enter the system as freshmen, attend lectures (mission) during their studies, solve problems/tasks (badge), and master skills that are then tested (challenge) in order to succeed in taking the exam (boss) with the aim of moving to the next year level). The ultimate goal is to complete your studies and obtain a diploma (badge). According to a study by Urh et al. (2015) on the use of gamification in distance education noted several advantages but also disadvantages. Numerous authors (Osipov, Jupiter, etc.) have conducted fundamental studies to evaluate the effectiveness of gamification in distance education. The commitment characteristic that characterized participants in gamification in distance education was also noted by Muntean (2011) while at the same time some authors also conducted similar experiments while Domínguez et al. (2013) record higher success rates in practical work. The emergence of playfulness in education is a very important change in the search process to achieve relevant goals online. The way of e-learning with gamification has significantly improved the way students learn, improved active participation and enabled them to gain greater knowledge of computer work. Through gamification, most students were satisfied with their learning, while it turned out that a high level of knowledge and behavior change was maintained. Many academic programs today involve the use of gamification strategies to encourage students to accept lessons and to include them in human resource training programs, as the result is up to four times more effective than retaining knowledge in the traditional way. Distance education through play is a key component that definitely leads to the achievement all teacher goals and that enables the completion of the training process through activities that provoke interaction. Difficult subjects such as mathematics, economics, computer science,

etc. through continuous interaction through the elements of the game, encourage changes in the educational process from the simple transfer of information to fun interactive learning experiences. Distance learning through play is in a way to transform learning through a combination of traditional learning mechanisms and dynamic gamification structures. The basic problem in today's education at higher education institutions is related to insufficient engagement and motivation of students and a low level of active participation in the learning process. In the educational context, high-quality motivation, for example intrinsic motivation, is associated with better outcomes than low-quality motivation, e.g. motivation through extrinsic rewards (Ryan, Children 2020). One of the ways to solve this problem is to increase motivation and engagement through a system of rewards, ie by using elements of the game in the production and delivery of digital educational materials. Digital games have a significantly high ability to keep users engaged, which is a potential that can be used to motivate students to interact more deeply with their learning environment and thus improve their performance (Bawa 2020). A favorable environment for the application of gamification in the learning process in higher education institutions is e-learning based on modern information and communication technologies.

Gamification as a relatively new concept is one of the modern opportunities whose application in the field of e-learning would enable its increasingly demanding community better and more modern courses (Ćosić, Zajmović 2019). Also, learning management systems (LMS) due to their characteristics such as automated data processing and monitoring student progress are conducive to the implementation of gamification. Docebo LMS already has a built-in "Gamification" application that allows administrators to create badges or awards that students can win after successfully completing a task within the LMS. The Blackboard LMS has a built-in achievement tool and allows students to win a reward for their learning engagement, while the Accord LMS directs students to collaborate with other team members. Rewarding students can motivate them and involve them in learning courses. Teachers can specify the criteria for issuing badges and certificates (Blackboard). The introduction of the concept of gamification into the educational process in higher education institutions must be taken seriously and implemented systematically on the basis of a previously agreed strategy. Scheme 2 shows a proposal of steps for the practical application of gamification in the teaching process in higher education institutions.



Scheme 2: Proposed steps for the practical application of gamification in the teaching process in higher education institutions

Source: Author's own research

The main steps of the proposed strategy include:

1. Defining learning goals and analyzing the use of gamification elements in teaching content, involves defining learning goals, student profiles, the appropriateness of gamification techniques and tools and their compliance with learning goals. Learning objectives must be well-balanced to avoid student demotivation and negative outcomes.
2. Defining the elements of the game and creating teaching content: the choice of elements to be included depends on the defined goals from the previous step.
3. Integration of gamification into digital educational content: A crucial part of gamification refers to the integration of tasks that students must accomplish. Each successfully completed task leads to collecting points, receiving rewards (eg badges), and ultimately to moving to a higher level. The scoreboard contributes to greater motivation of students because they try to be better positioned. The implementation of this step is the responsibility of information technology experts who will do the gamification integration using some of the gamification tools (eg FlipQuiz, BadgeStack, etc.)

4. Analysis of digital educational materials: teachers in this step analyze digital educational materials in order to check the success of the integration of gamification elements.
5. Application of gamification: the use of digital educational materials with integrated elements of gamification in the teaching process.

The integration of gamification into the educational process in higher education institutions does not necessarily imply the use of information and communication technologies, but in practice it has been shown that many gamification projects require the support of these technologies. Therefore, the previously described strategy relies on the strong support of information and communication technologies.

CONCLUSION

In order to improve the performance of education systems, it is necessary to adopt new teaching concepts. These new concepts aim to make teaching content interesting, modern and to be delivered in a way that will meet the requirements of modern students. Gamification as a relatively new concept is emerging as one of the possible solutions. Basically, gamification involves the use of game-based mechanisms, techniques, and aesthetics in a non-game environment to initiate certain behavioral patterns that favor the learning process. Gamification can be applied to many areas such as health, marketing or education. When it comes to the application of gamification in the context of higher education, there are several possibilities for its integration into the teaching process. One of the most appropriate ways is integration into e-learning systems which, due to their characteristics, favor the implementation of gamification. Also, learning management systems, due to their characteristics such as automated data processing and monitoring student progress, affect the implementation of gamification.

This paper presented key concepts, contexts and frameworks of gamification. A detailed overview of gamification definitions is offered and its main elements are presented. The main contribution of the paper is reflected in the presented proposal of the strategy for the implementation of gamification in higher education with an explanation of the steps for its practical application in the teaching process in higher education institutions. The proposed model aims to help gamification practitioners in activities aimed at increasing student motivation and engagement. Future research will focus on practical examples of the implementation of gamification and on examining students' attitudes about whether and to what extent curricula with elements of gamification facilitate learning.

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