KAPITEL 3 / *CHAPTER 3* [3]
THE POWER OF GAMES: WHAT, WHY AND HOW TO EMPLOY IT IN EDUCATION

Introduction

Games were exploited in education a long time ago, their ability to capture and hold attention of players were known to ancient civilizations. If those principles according to which game players develop their skills and enrich their experiences, were applied in real life, it would be possible to improve educational systems, increase productivity at work, create collaborative communities, and solve many other problems of human beings at a global scale. In order to achieve this goal, it is necessary to destroy the stereotypes about games and create a partnership of the main actors from various spheres of life (McGonigal, 2011, p.14). Combining games with learning, applying rewarding game elements to the educational content sparkles learners' interest, stirrs curiousity and competitive spirit, opening endless possibilities of learning in various spheres of human life (Arnold, 2014; Giang, 2013).

Innovation and technology of the 21-st century opened new perspectives. Human's basic needs and desires are the same, but the ways of motivating digital learners are drastically different from those which were effective before (Prensky, 2001; Qian & Clark, 2016). Ubiquity of technological advances, digital devices, new applications has given rise to the search for other approaches in education to meet learners' needs. Thus, game-based teaching methods gain theoretical foundations and prove to be effective for diverse learners in various educational environments. What makes games in education powerful is fusion between engaging students and technological opportunities, which open many ways of delivering and processing information efficiently. Immediate feedback, cost-effectiveness, students' autonomy lead to changing traditional teacher-centered classrooms into learner centered, turning teachers into facilitators, supervisors and designers (Gamification and the Future of Education, 2016, p.42). In addition, games enable access to education, a fundamental human right, especially in cases when traditional formal access is denied or not possible. Digital game-based learning ensures not just access but access and learning for those underprivileged students who otherwise may drop out, fail exams or not show

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progress during their study (Design and Approach to Digital Game-Based Learning, 2018).

However, it would be erroneous to consider games "silver bullets" which will automatically change education systems for better. Mechanical duplication of successful gamified practices may fail, stipulating learners' progress and even causing harm (Sheldon, 2020.) Therefore, gamification should be present at all the stages of teacher training, professional development programs, curriculum design in order to meet students' social needs in new changeable environments (Gamification and the Future of Education, 2016, p.42). It is possible to describe "digital divide" as reluctance of pre-service and in-service teachers to use digital games in their classes which is based on stereotypes (Blume, 2019, p.20). Destroying those stereotypical attitudes, applying the principles of game mechanics and game dynamics equips educators with the tools, which make students excited about their studies. Designing lessons like games engages students through unleashing their creative potential and empowering them. Presumably, getting started with using game elements may eventually lead to creation of multiplayer classrooms which accommodate a wide variety of learners' needs (Sheldon, 2020.)

2.1. Defining game as a system

Games belong to people like legend or myths. It is impossible to claim where exactly a certain game originated, as similar games were played in different places at different times. African and Balkan games were much more popular in the United Stated and Canada by the year 2000, because the games' countries of origin were overwhelmed by famine and war (Duckert, 1993, p.15). The evidence about games in ancient times is provided by archaeology. Various artifacts recovered from cemeteries, cathedrals and other places, graphic information like murals and paintings, prove the popularity of games. In addition, they provide details on what kind of games existed then and how they were played. There are other sources of information related to games: ancient writers mentioned the names of the games in their literary works, antigambling laws were imposed in Rome over 2000 year ago, and the ancient Chinese manuscripts presented controversial issues related to gambling of the workers, to name just a few. In fact, books and folklore sources mentioning playing games are abound (Avedon & Sutton-Smith, 1971, p.21–23).

There have been claims that traditional or so-called classic games are dying out. Moreover, that because of video and computer games, organized sport and television the ability of young people to play old school games is lost. However, it is far from the truth, rather than discarding classic games, children preserve them and adapt continually. Running and chasing games like competitive ball games, cops and robbers have been popular despite the fact that they go back to the ancient time, when humans had to hunt and battle in order to survive. Traditional card games are also adapted to the needs of digital natives, when players create their own cards, rules, and objects depending on situations, play online or offline, individually or in teams (Duckert, 1993, p.18).

There are many approaches to describing what a game is, it may be: a form of play, amusement, recreation, sport involving specific rules, sometimes using special equipment, requiring skill, knowledge and stamina; a condition of a leg when someone limps; wild animals, birds or fish hunted for sport or food. The explanations of etymologists relate the usage of the same word to describe behavior of humans as well as animals, which after many transformations resulted in the word "game" referring to a human activity, a twisted leg and a non-domestic animal (Avedon & Sutton-Smith, 1971, p.2–3).

It is important to distinguish between the notions of "play" and "game". While play is considered to be a type of behavior, therefore unique and individual, game is a structured activity which is possible to recreate by others in various environments. Play is seen as an exercise of voluntary control systems, which is open-ended regarding outcomes. In contrast, game is defined as an exercise of voluntary control systems in which the participant's control over procedures target a given goal (Avedon & Sutton-Smith, 1971, p.5–7, p.236–377). Some researchers use the terms "play" and "game" interchangibly, addressing humans as players first of all. Thus, Huizinga (2004, p.446), one of the most prominent researchers in the area of entertainment, disembarks the myths of play and games as non-significant and superficious, stating that play was invented earlier than culture (Huizinga, J. (1955). Another term "meaningful play" is also widely used, as three terms "play", "game" and "meaning" are closely connected (Salen & Zimmerman, 2003, p.47). In fact, play in the context of a game emerges from interactions between the players, so that is what makes it meaningful. The essence of interactions is making choices, which means that every action players take should have a result (Salen & Zimmerman, 2003, p.49). There are two approaches to define meaningful play: descriptive and evaluative. The descriptive approach focuses on the

relationship between players' actions and results, which exist in a carefully designed system of a game. The evaluative approach states that actions and results should be discernable (predictable) and integrated (interconnected) into the whole system of a game (Salen & Zimmerman, 2003, p.52). In fact, an action is discernable when players know what the result would be. Otherwise, actions taken by players, would be random and chaotic. The relationship between an action and its results is integrated if any move has not only an immediate outcome, but it changes the whole game and its overarching goals. Therefore, relationships between actions and results reveal the meaning of a game in general. Successful game design is based on meaningful play, but, at the same time it is important for single actions and results to be discernable and integrated into the whole game (Salen & Zimmerman, 2003, p.50–51).

The notions of game and play are defined using two approaches, typological and conceptual. Typological, which considers the forms of game and play in real life, considers play as a broad concept, whilst game as narrow. Indeed, comparing playful activities people are engaged on a daily basis, like playing in a sandpit or roundabout, with others, like backgammon, cards or Scrabble, only some may be considered as games. Play is not as formalized as game, the rules are less strict, there may be no winners, as far as players enjoy the process. However, conceptual approach considers play as being a fundamental, but still a component of game (Salen & Zimmerman, 2003, p.84).

Comparison of the definitions made by some prominent researchers indicates disagreement on game elements despite the fact that ten out of fifteen elements are chosen by more than one author. In particular, seven out of eight researchers agree on such game elements as rules, which limit players' actions, and five on the fact that games are goal-oriented. Three authors believe that games involve decision-making, various events or activities, some kind of a conflict, they also state that games are not connected to real life and not obligatory to play. Two definitions of games contain such elements as imaginary aspects, systems of resources, and no profit. Just one author thinks that games are not serious, definite or efficient, they constitute a form of art and create social groups (Salen & Zimmerman, 2003, p.91–92). Researches highlight the elements which are present in the majority of games: purpose, procedure, rules, number of players and their roles, patterns of interaction, results or rewards (Avedon & Sutton-Smith, 1971, p.422). Still, it is possible to focus on four basic game elements like objects, attributes, internal relationship and environment. Objects may be tangible or not, attributes are qualities of the system and its objects, internal and external contexts

the system belongs to. There are three levels of a game as a system: formal, experiential, and cultural, which are interconnected and should be taken into account when designing a game (Salen & Zimmerman, 2003, p.67–68).

One of the key characteristics of a game is interactivity, as a player makes choices taking explicit actions which involve a game system, another person or people, an object, or an idea. At a formal level a player interacts with objects, at the social level with other people, and the cultural, which includes other contexts beyond the play. Interaction between people means that they take turns to initiate reciprocal actions within a game system. Evidently participants should actively listen, think, and then react by saying or doing something in response, therefore, this process is cyclic and may be repeated many times (Salen & Zimmerman, 2003, p.69–70).

Game design is a process of creating a particular context for the participants to have meaningful interaction, which may be done by a single person or a team of people. In some cases it is not possible to clearly indicate the designer as games may originate from traditional folk or fan culture a long time ago. "The context" is the environment presented by various location, items, narratives and modes of behavior (Salen & Zimmerman, 2003, p.54). The concept of structure or rules is basic in understanding the context, as it provides understanding of various combinations and interactions between signs and game elements (Salen & Zimmerman, 2003, p.60). "The participants" of a game are players who interact with each other or other elements of a game within various contexts. "Meaning" is closely connected with the players' actions and results throughout their play. The study of the processes related to making meaning is called semiotics, for which "sign" is one of the key concepts (Salen & Zimmerman, 2003, p.55–56). According to Peirce (1958), the term "sign" is something, which means something else for somebody in some respect or capacity. The concept of a sign suggests its basic characteristics: representation of something else than itself; its interpretation results in acquiring some meaning; its interpretation, and, therefore, meaning are strongly influenced by context (Pierce, 1958, p.37). These characteristics are crucial for understanding of games, as the meaning of signs depends on their interpretation, and the outer environment which is created by people. Thus, a sign has its value only in case the participants of a game agree on its meaning (Pierce, 1958, p.59).

There are numerous possible ways of classifying games. According to the usage, games are classified into six main groups:

1) games used for recreational purposes (gambling games, board and table games,

sports);

2) military usages (games in military science);

3) business and industrial games (games in business and industry);

4) games in education (games in teaching different subjects);

5) games in diagnostic and treatment procedures (games in psychiatry, physiatry, general medicine, etc.);

6) games in social science (games in political science, economics and sociology) (Avedon & Sutton-Smith, 1971, p.237–376).

Another classification consisted of seven genres was approved by academicians who implement gamification in higher education:

1) action games are video games which require response;

2) adventure games create obstacles for a player to overcome;

3) fighting games suggest winning or losing battles;

4) role-playing games when players try different identities;

5) simulations look like real world where players complete various tasks;

6) sports games remind of real kinds of sports;

7) strategy games require players to survive in fictional settings (Gros, 2007).

Games are classified according to their dimensions, which are preconditions of players' behavior influencing the process and results. Therefore, by selecting suitable dimensions it is possible to make a gamified experience more controlled, enjoyable and educational. There are some dimensions typical for the most widespread games:

1) body contact (pushing, touching, using props, competitive or not);

2) bodily activity (static vs. mobile, rigid vs. fluid, vocal expression);

3) skill requirements (imagination, manipulation, language, reaction time);

4) chance determination of success (luck games using dice, spinners);

5) competition (winning or losing, goal or opponent directed, team or individual);

6) use of space (amount and space usage);

7) time considerations (natural termination, well closured steps);

8) prop usage (playing, obstacle and goal props);

9) role-taking (function differentiation, control position, imagination roles);

10) rule complexity (progress making, special rules);

11) interdependence of players (Avedon & Sutton-Smith, 1971, p.408).

Summing up, a game may be defined as a system in which players engage in an artificial conflict managed by rules, the result of which is quantifiable. Game design is the process of creating a game, from which meaningful play emerges when

encountered by a player (Salen & Zimmerman, 2003, p.93). Gamification is understood as using the mechanics of games in various spheres of human life to make learning more engaging. However, one should remember that any definitions are open for interpretations and debates (Apostol et al., 2013).

2.2. The driving force: why to play games

Compared to games, real life does not always motivate people, provide pleasures and challenges, develop close connections with others or bring ultimate happiness. The word "phenomenon" is used to describe the popularity of games, which is indicated by hundreds of millions who spend more and more time playing games. While some may devote to games just one or two hours per day, for "active players" this number is as much as thirteen hours per day. Remarkably, spending at least twenty-two hours a week equals a part-time job (McGonigal, 2011, p.4). Considering all the varieties of games, it is possible to claim that most people enjoy playing at least few kinds of games (Hägglund, 2012, p.3).On the other hand, there are non-gamers, who are sure that playing games is a waste of time and parents, educators and politicians call for action in order to stop the expansion of this addiction. However, playing games belongs to basic human needs and desires like surviving, having a family, being happy, reaching the goals, which has remained the same since the ancient times (McGonigal, 2011, p.5–6).

There have been many attempts to define human motivation, when Greek philosophers considered motives to be related to physical needs like eating or drinking, and the needs of human mind like curiosity or partnership. In the 20th century human motives were considered to belong to ether those looking for pleasure or avoiding pain. There is another division of motives, one category called drives associated with extrinsic motivation, examples of which are hunger, thirst and pain avoidance, while another category called intrinsic motivation (IM), examples of which are curiosity, autonomy and play (Reiss, 2004). Intrinsic motivation, self-regulation and well-being are considered to be in correlation with three main human needs: competence, autonomy and relatedness. In case of satisfaction of these needs intrinsic motivation, self-regulation and well-being are enhanced, which is significant for many spheres of human life, especially health, education and work (Ryan & Deci, 2000). However, proponents of multifaceted theories argue that human nature is too complicated to fit

the prescribed number of categories. Indeed, those individuals, who are motivated by the need to play, may lack motivation by curiosity or autonomy. Therefore, the hypothesis that play, curiosity and autonomy constitute a desire for competence, is undermined. Highly motivational are also values like social contacts, revenge, social status, to name just a few (Reiss, 2004).

According to McGonigal (2011), all human beings are divided into two categories: gamers now and gamers in the future (p.12). Therefore, it is necessary to get understanding of how games work, influence societies and lives of people, why so many people are addicted to them, what to do in order to use all the opportunities provided by games. Those who develop games, know how to motivate people to work hard and reward their efforts, how to build cooperative and collaborative networks, how to encourage players to challenge their abilities on a larger scale. Obviously, game design is not just a clever trick, but the twenty-first-century way of thinking which may change the world for better (McGonigal, 2011, p.12–13).

Critics of games claim that the reason of their popularity is that people escape from reality. However, there are games, which have strong connections with real life and may be called antiescapist games (McGonigal, 2011, p.125). Alternate reality games (ARC) create a special environment for players who, in order to win a game, solve real life problems, work with enthusiasm, built strong relationship with other people and become more confident in their success. "Chore Wars", which is another version of "World of Warcraft", involves family members, groupmates, neigbours or colleagues, who compete with each other and, as a result, do their house chores with enthusiasm and inspiration. Indeed, everyday routine duties are not obligatory anymore, because they are adventures the players are looking forward to. Thus, the players become heroes leveling up their avatars' power, being satisfied by reaching the aims, getting rewards and having real benefits from their virtual gold (McGonigal, 2011, p. 120–121).

The most powerful features of games appealing for players are called "four freedoms of play". The freedom to experiment is related to many opportunities a player has to choose the best strategy for completion of the task. The freedom to choose identity is not only about exploring and observing the environment, but about trying various identities and patterns of behavior for a player. The freedom of effort suggests variations between intense and relaxing modes of play. The freedom of interpretation is related to unique experiences of players because of their individual, social and cultural characteristics (Klopfer et al., 2009, p.4–5). Having the ability to make

personal choices, try different identities, alterate their playing mode, draw their own conclusions makes players think that their actions and decisions matter, which is empowering and engaging.
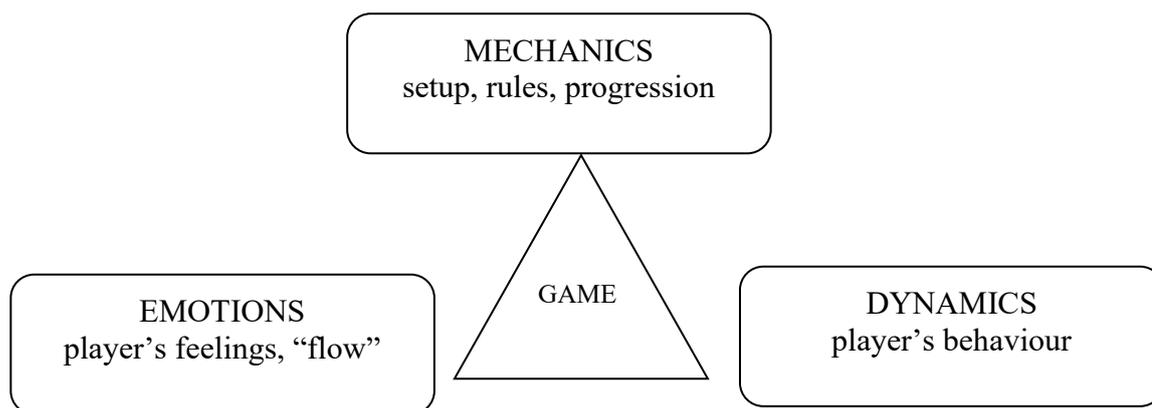
Game mechanics, game dynamics and emotions are driving forces which motivate behaviour and satisfy human needs. Game mechanics are systems regulated by rules following which players interact and improve their practice receiving immediate feedback. By combining game mechanics like building blocks it is possible to create various ways to motivate players. Movement is an example of game mechanics, when either players change their location, or cause something else to move. Resource management is involved in many games, when players manipulate with tokens, ammunition, money, eventually changing the results of the game. Spying is a part of many games, when players should collect information from conversations of others, break into someone's homes, or cheat. However, situations which tempt players into rescue operations, are also common (Hägglund, 2012, p.3–4).

Game mechanics works better combined with game dynamics, which ensures that players act in a predicted way. In addition, it provides equal opportunities for anyone to succeed (Hägglund, 2012, p.4). Four player personality types, often represented as Clubs (Killers), Diamonds (Achievers), Hearts (Socializers), and Spades (Explorers), ensure that balance. As defined by Bartle (1996), their behaviour is determined by their distingushed features. Apparently, killers look for fighting, achievers collect rewards, socializers rely on communication with other players, explorers descover something new and share their findings with others. Killers act on other players demonstrating their strength over other players, they use their accumulated knowledge to practice their fighting skills and show their superiority. Achievers focus on acting of the world, they take pride in their status in the game and in the time needed to achieve it, whilst socialisers look for interaction with other players, treating the world of game as a setting for communicative activities between various characters existing there. Their primary goal is to learn more about others and introduce themselves. Explorers look for interactions with the world, they appreciate something new they learn as the result of that communication (Bartle, 1996).

It is possible to sustain constant interest to a game by balancing four dimensions: players vs world, and acting vs interacting. Thus, in order to focus on players, connectivity between the rooms, the number of facilities for communication, simultaneous players should be increased. On the contrary, to emphasise world, building facilities should be easy and intuitive, and building priviliges should be

encouraged, keeping just basic communication facilities (Bartle, 1996). Finally, emotions of players determine direction and outcomes of their actions, creating atmosphere of competition and cooperation. The concept of the "flow" reflects the emotional state when a player is totally focused on the task and cannot stop moving towards the goal enjoying this process. (Csikszentmihályi, 2005). Needless to say that driving forces of a game are interconnected and balanced (Figure 1)

Figure 1. Driving forces of a game

(Robson et al., 2015, p.416).

Mechanics represents goals, rules, context, which engage players. Dynamics is related to players' behavior when they are on the way of reaching the goals of the game. Emotions represent players' feelings and reactions during a game, which contribute to engagement and learning (Robson et al., 2015, p.416). Therefore, but keeping these forces interconnected and balanced, it is possible to create an engaging gamified environment in any sphere of human life.

2.3. Using games in education

Playing games has been considered a form of learning since ancient times, as in order to play a game and have enjoyable experience children have to follow the rules, otherwise, it does not work (Avedon & Sutton-Smith, 1971, p.322). The researchers define the concepts of games and gamification, exemplify both and highlight their importance, they also investigate the problem of applying gamification to education (Apostol et al., 2013; Barata et al., 2013; Dichev & Dicheva, 2017; Ilhan, 2021).

Enjoyment is highlighted as the most prominent feature of using games in education, regardless of the amount of the material which may be the same or even less than usually. Two aims are reached by using games at the lesson: motivating students and preventing management problems, which are especially acute in high school and at college levels (Avedon & Sutton-Smith, 1971, p.315).

Positive impact of gamification on academic performance is proved by many researchers who, first of all, highlight boosting students' motivation, at the same time describing the difficulties of planning and implementing the ideas in practice (Dominquez et al., 2013; Sera & Wheeler, 2017; Dichev & Dicheva, 2017; Turan & Goktas, 2015; Cameron et al., 2019). Using games is not limited by age, it is an inseparable part of tertiary education in general, and professional training, corporate education in particular (Lytovchenko, 2016). The research in the 1960s mainly focused of four hypotheses: students show more enthusiasm and interest by participating in gamified activities, they learn more and retain information longer than when involved in traditional activities; and, finally, their attitudes change drastically. According to Avedon (1971), the first hypothesis was accepted at that time, the one about student's genuine interest in games compared with traditional activities in class. The researcher came to the conclusion that games in simulations are useful tools for getting and keeping students interested in the activities at lesson (Avedon & Sutton-Smith, 1971, p.321). One of the studies of gamified learning, which involved 13,000 students and more than 900 teachers from fifteen countries, indicated success rate 71% of students obtained A, B or C, while game-based approach success rate reached 93% of students received an A, without a B, C, or D. Moreover, students completed twice as much of the material in a shorter period of time (Sheldon, 2020). The main idea of using games in education is that the subject matter, be it for a history or language lesson, is offered in the form of a game. There is a notion of a "good" game in education as the one which helps the learner to learn. For example, at the beginning of a new academic year students play a game "Bingo" to learn each other's names, which has a practical value and creates a friendly atmosphere at the lesson (Avedon & Sutton-Smith, 1971, p.315).

Using games in education starts in nursery school, but with leaving primary and secondary school for higher education establishments, "games" may be referred to as "simulations", or these terms may be used separately, as "games and simulations" (Vlachopoulos & CMakri, 2017). Some educators claim that "simulations" in higher education reflect real life situations and drastically differ from "games". Anyway, expanding from business and industry to economics and political science, games have

become an integral part of university curricula. Thus, it is possible to talk about games with simulated environments, research and development of which is performed by sociologists, anthropologists, economists, and many other experts. These "good" games develop problem solving and decision-making skills in a wide range of contexts such as business management, economics, international relations, political science, to name just a few (Avedon & Sutton-Smith, 1971, p.319–320).

The unique feature of games as simulations is that players learn by going through some experiences of witnessing the consequences of their actions, which is impossible in case of using traditional teaching methods. Having the hands-on experience allows the players to learn decision-making and problem-solving techniques in a contemporary society. Using games in education promotes development of communication and cooperative skills, changes players' attitudes towards learning, creating a friendly atmosphere by lowering affective filter, removing fears of doing something wrong (Avedon & Sutton-Smith, 1971, p.320).

However, the assumption that any game-based learning environment fosters students' problem-solving skills is erroneous. Motivation and engagement are necessary preconditions for reaching the goals of an educational game. According to the results of the research, problem-solving competence may be enhanced in case of creating an environment which provides attainable challenges, autonomy for students to take decisions, and tasks which require solving problems (Eseryel et.al., 2014, p.51). Creating educational games, which are as attractive as commercial games, collecting the data of students' attitudes and emotions, assessing their cognitive, decision-making and other self-regulation processes is extremely challenging (Eseryel, D. et.al., 2014, p.52).

Pedagogical potential of games is yet to be explored, considering their impact on students' lives. Application of games could be much more than just replacing a textbook by online flashcards, breaking away from the traditional approaches in education based on memorization. Instead, students could have their own educational paths in a maze of science and art by exploring, interacting, experimenting, sharing, creating, assisting others in achieving their goals. One scenario aimed at leveling up science and engineering education of high-school students used a curriculum consisted of electronic and physical games. The role of a teacher was to monitor activities of students, adapt the rules of the games to their needs, design contested spaces. Students worked in heterogeniuos groups named gaming communities, solving problems together and sharing what they learnt from their experience with others. Eventually,

students achieved such a level of autonomy that the interference of teachers was minimized, and using critical thinking, experimenting, learning on their own mistakes, students developed competencies which are needed in real life, far beyond gameplay (Squire & Jenkins, 2003). Using games in education, which fosters motivation and engagement, greatly influences students' problem-solving abilities and critical thinking, but it depends on design features of a game. Complexity of problem-solving tasks in a game should be combined with students' autonomy in order to reach their goals (Eseryel, 2014; Cicchino, 2015).

Considering the issue of using games in education, it is necessary to take into account gaming experience of schoolchildren and students. In fact, most of them are game players from an early age, therefore having access to online games and virtual reality their entire lives. Consequently, they have high expectations of active participation, immediate feedback and positive encouragement. However, in traditional classrooms they have to overcome obligatory obstacles and experience mostly negative feedback without an opportunity to have another try. The gap between real and virtual world is growing causing disillusions, apathy and discouragement (McGonigal, 2011, p.127). In order to sparkle students' interest to their subjects, more and more educators use or create their own games, combining game elements with the educational material. At the same time some researchers and educators claim that including games in traditional lessons is a positive improvement, but not significant enough. Thus, the first school "Quest to Learn", where all educational experiences were designed like games, was created in New York, serving as a model for other projects all around the world. Lessons turned out to be quests, home assignments looked like secret missions, and textbooks contained coded messages, which meant that completion of the tasks was a self-chosen goal had to be achieved in a highly competitive environment, better or quicker than others (McGonigal, 2011, p.128–129). Assessment policy allowed several attempts to complete a "mission" and level up, accumulating the desired number of points and getting positive encouragement. The focus shifted from grades to the process, motivating learners to strive for another educational experience. Each student who demonstrated a particular achievement became an expert and designed quests for others, generously sharing with them their intellectual superpowers like problem solving, strong collaboration and innovative thinking (McGonigal, 2011, p.130).

Games have three basic characteristics, which are widely exploited in education: rules, which guide a player's actions during the game, feedback systems, which insure interactivity, and clearly defined. Game elements, which are crucial for engaging

students to the extent that fosters effective learning, may be classified into three categories: mechanical, personal and emotional (Gamification and the Future of Education, 2016, p.4–5).

Mechanical elements include incremental progression, goals, onboarding and instant feedback (Figure 1). Incremental progression consists of presenting gradually increased challenges to players so that they are neither bored not overwhelmed by the problem. Challenges called missions, levels or quests are sub-goals on a way to the ultimate goal, and offer immediate rewards. Moving from one problem to another has a cumulative effect, and players gradually develop their skillsets. Rewards or badges visualize success and encourage players to achieve the ultimate goal. Onboarding aims at supporting players at the beginning of a game, providing instructions and guiding them through the first minutes to ease grasping the concept of a new game. Onboarding in education ensures engaging students in a new activity, and saves time spent on lengthy explanations of a teacher, which are time-consuming and too general. Instant feedback is insured by publicly displayed achievements so players can see the dynamics of their progress. Short feedback cycles let students know if they met expectations, what they should do to improve the situation until it is too late (Gamification and the Future of Education, 2016, p.6–7).

Personal elements comprise avatars, collective responsibility and leaderboards (Figure 1). Avatar is a visual representation of a player's identity which range from 3D models to symbols. Usernames, handles or tags allow players to try new identities in order to have another approach to solving problems, taking decisions in-game, communicating with other players (Gamification and the Future of Education, 2016, p.8). Collective responsibility is the basis of teamwork and cooperation. Playing individually, it is tempting to quit at any point of a game, but in case of multiplaying, teammates depend on each other and keep on playing because they do not want to disappoint others. This element has been widely used in education, when with social responsibility students' emotional investment, and, therefore, motivation, increases. Secondary schools in the XIX-century English-speaking world used "house" system, when individual inputs of students accumulated and their teams (houses) were awarded at the end of the year. By encouraging increased efforts, schools, which employed "house" system, demonstrated better results compared to those which did not (Gamification and the Future of Education, 2016, p.8). Ranking is common in competitions and games. Leaderboards visualize the progress of players by means of points-based system according to players' abilities or achievements. However, public

display of students' points is not recommended in education because of ethical reasons. Those students who have poor performance may suffer of social exclusion or depression. In some cases the results of top participants may be on display (Barata et al., 2013).

Emotional elements are based on the concept of "flow" (Figure 1). The concept of flow describes the state of mind when a person is totally focused on the task. In gamification it serves dual function, of a technique and a goal. There are three preconditions for such a state of mind: a clear goal, immediate feedback and balance between challenge and skill. Goals determine the chain of actions aimed at achieving them, feedback helps to check if a person is on the right track. A person should neither be bored when the task is too simple, not anxious when solving the problem is too challenging (Csikszentmihályi, 2005). Quest chains used in games are employed in education providing a context for teaching individual concepts, when one task or quest leads to another. Such introduction of problems helps learners to visualize the whole picture of the task and retain it for a long time (Sheldon, 2020, p.130). Game designers use incremental progression to keep players' interest and reach the state of flow which is illustrated by dynamic difficulty adjustment (DDA), when some game parameters change according to a player's performance. The state of flow is desirable in education as well, but it is difficult to achieve in a noisy classroom. Using game elements may break the routine and engage students into a series of tasks which are novel and unusual, and, as a result, increase their focus on the educational content (Gamification and the Future of Education, 2016, p.12).

Using games in education aims not only at engaging students, but teaching them more effectively. There are several ways of doing that: using existing commercial or applied games, and using games created for specific classes by outside developers, teachers or students (Sheldon, 2020, p.9). An opportunity to provide critical feedback on the performance or outcomes of others increased intrinsic motivation. If students know that others will judge what they create, they will be more tolerant and supportive (Sheldon, 2020, p 95). Error correction is one of the basic differences between traditional teaching practices and games. Focusing on mistakes creates a situation when assessment becomes more important than content, while games provide plenty of opportunities to succeed whatever tries a player has. While mistakes are punished in a traditional classroom, playing games is impossible without making mistakes which are seen as a source of information and an opportunity to learn. A player is not to blame, as it is not him or her, but their avatar who makes mistakes. Learning how to solve a

problem by failing several times, avatars survive and get rewarded for their efforts. It is not surprising that students may play games round the clock, while fearing to submit their home assignment because of the risk to fail without having a second chance (Sheldon, 2020, p.11–12).

Learning how to communicate with others is crucial in the context of a game and in real life as well, a career advancement in particular. There are three main ways to communicate in a multiplayer classroom: through writing, speaking to a teammate and presenting to a number of people. As shy students need an assistance of a teacher before speaking in public, it is advisable to extend their exposure gradually (Sheldon, 2020, p.57). It is important to group students carefully: close friends should be in different teams in order for players to learn how to collaborate and negotiate in a new environment, the skill which is useful in any workplace (Sheldon, 2020, p.36). Students' engagement in collaborative and competitive activities is crucial as doing so, they focus on helping others in order to achieve common goals for their guilds. Shifting attension from their individual grades gives students an opportunity to overcome their fear of failure and be more confident by learning from their peers (Sheldon, 2020, p.57; İlhan, 2021).

Monitoring and observing players is crucial. MMO can track players' activities automatically and indicate their engagement by marking clusters, which mean enjoyment, and empty spaces, related to boredom. Teachers in real classrooms do not have such possibilities and should rely on monitoring and observing their students to prevent their failure at the exam (Sheldon, 2020, p.39). Playing games in self-selected groups differs from playing games in more structured situations. There are three leadership roles in case of organized games: teachers, coaches and negotiators. Teachers should know how to play the games they use in the classroom, they share the aim and the rules with the players and follow them. In fact, the rules belong to the game, but the teacher takes into account the participants' abilities, preferences and skills that need to be developed. When the players are familiar with the rules of the game, the coach monitors the activity, if necessary, suggest playing another game or two games in groups. The coach should support both winners and losers, select the games requiring different skills, balance the number and variety of games. The negotiator introduces the art of peacemaking, aiming at fair play, using various strategies for choosing games, the order of players, the ways of finishing a game, and, if necessary, changes the rules or stops the game (Duckert, 1993, p.20–21).

Multiplayer classrooms suggest exploiting usual activities which are coded using

gamer jargon, e.g. "taking quizzes" means "defeating monsters", "individual reading" becomes "solo quest", and "team" is replaced by "guild" (See the Table 1).

Table 1. Conventional and Multiplayer classroom terminology

Conventional classroom	Multiplayer classroom	Conventional classroom	Multiplayer classroom
Student	Player	Real-world abilities	L33t skillz
Teacher	Game Master	Section of the classroom	Zone
Student name	Avatar name	Quizzes / Midterm	PvE
Team	Guild	Student competitions	PvP
Take quizzes / exams	Defeat / fight monsters / mobs	Class fails a quiz	Wipe
Write	Craft	Copy editing	Farming
Presentation	Quest	Midterm exam	Boss mob
Designer	Mage	Programmer	Warrior
Writer	Ranger	Artist	Healer

(Sheldon, 2020, p.43–44, 84).

It is important to set tight parameters of an assignment while keeping the scope of projects manageable. At the same time, the multiplayer classroom should be flexible in order to give students agency and enable them to make meaningful choices. Rewarding students for attending a class is more effective than punishing for skipping it. Once given away, tokens may be sold, swapped, or spent in any other ways imaginable. For example, it is possible to submit an assignment later or use notes in a boss fight for one token, but changing team name requires twelve tokens (Sheldon, 2020, p.44). One more distinguished feature of the multiplayer classroom is the number of assignments like in an MMO, which has enough repeatable tasks for trying as many times as possible and levelling up (Sheldon, 2020, p.55).

2.4. Playing games and learning English

Instructional ESL planners, while prioritizing effective approaches and tools, should be sure to exploit the power of games that create a naturally playful environment for using the target language and retain the learning material. Game-based Learning

(GBL) is a technique used in education in order to achieve better learning outcomes (Saha & Singh, 2016, p.31). Foreign language learning includes not only grammar and vocabulary knowledge, but developing communicative competences. Digital game-based learning provides such opportunities for rehearsing and experiencing practical usage of the target language in situations, which are close to real life (Casañ Pitarch, 2018, p.1147; Liu, 2021).

Combination of GBL and Cooperative learning leads to better results if ESL practitioners follow certain principles in their classrooms concerning grouping, cooperation, competition, leadership, discussion, and use of a target language. It is advised to create heterogeneous groups as students help each other and learn better in that way. Before playing a game, the participants should agree on the guidelines of cooperation which they follow consistently. Cooperating within their groups, students compete with other groups, which is the driving force of any game. It is important for each member of the group to improve their leadership skills, therefore, dominance of one or few participants and passive observation of others should be avoided. That is why discussion of the game and, if necessary, language issues, should be encouraged in groups. In this way all the participants become responsible for the outcomes of the game. However, language learners often switch to their native language during discussion, especially those who lack the vocabulary needed for negotiations. In this case teachers should turn to scaffolding and encouraging using the target language. Needless to say that effective cooperation may be possible by following the principles of collaborative interdependence and individual accountability, which has a positive impact on achieving better results (Bado & Franklin, 2014, p.12–13).

Recommendations based on the findings of the study on an educational video game "Trace Effects" cover grouping, principles of cooperation and competition, leadership, discussion and using target language. Despite the fact that students were free to form teams, heterogeneous groups proved to work more effectively than homogeneous. Students need clear guidelines to follow the principles of cooperation, creating a friendly atmosphere. Keeping balance between cooperation and competition, mutual support and desire to win is important as it fosters motivation of students. Each player should control the keyboard in order to avoid boredom and passive participation, discussions also contribute to taking collective decisions and achieving better results. Using an educational video game demonstrated its positive impact on high school students' learning outcomes, vocabulary and writing in particular (Bado&Franklin, 2014, p.12–13).

The use of one of gamification technologies named Kahoot platform in teaching English for specific purposes to technical university students, according to the results of the experimental study, showed its effectiveness, as students demonstrated not only a higher level of achievement, but also more active engagement and deeper motivation for learning the language. Using Kahoot platform in ESL class for technical university students proved its effectiveness influencing academic performance, engagement and motivation. The researchers claim that it was possible to engage those students who were quite passive in their language class before the experiment (Głowacki et al., 2018). Presumably, playing games in class ensures the shift from teacher-centered to learner-centered environment. Vocabulary games may be used in an ESP class aimed at learning or revising key terms. Moreover, considering the difficulty of finding commercial games in a certain area, students may create their own games based on their major. Any traditional game like "Snakes and Ladders" may be modified according to the needs of an ESP class. Creating games in groups, students then swap them with other teams, providing meaningful feedback. The role of a teacher is to observe students, facilitate the process of creating new games and encourage them to use target vocabulary (Chugai, 2020, p. 447).

Using GBL in teaching English increased students' academic achievements and interest in learning English. Visually attractive games in structured lessons which consist of instruction, presentation and reflection add fun and challenging aspects of learning, which sparkle students' interest in the classroom activities. As a result, students are fully engaged in their foreign language lessons and demonstrate their enthusiasm. Reflecting on their experiences allows students to assess their performance and understand the benefits of gameplay (Ghazy at al., 2021). Besides enhancing learners' motivation to learn English, games extend time of exposure to the resources in the target language. Using gadgets, which became a reality in classrooms, makes it possible to use a digital game-based approach in various educational environments. In addition, it is possible to combine individual and cooperative learning for classroom activities or home assignments (Casañ Pitarch, 2018, p.1155).

Games are usually welcomed by students in ESL class, but still there are some who are reluctant to playing games at the lesson. Stereotypical view of games as the source of fun, not learning, maybe one of the reasons. Another reason may be the necessity to cooperate with others, which can be challenging for those students who have difficulties with socializing (Herrera Rodriguez, 2018, p.72.) The research demonstrated that practically all teachers of English in an Albanian high school often

employ games during their lessons (Bendo & Erbas, 2019, p.55). However, some teachers admitted that it was time consuming to adapt the materials for such a class (Bendo & Erbas, 2019, p.58). Summing up, using games in learning foreign languages, English in particular, offers a lot of possibilities yet to be explored and developed.

2.5. Survey: students' attitudes to playing games and learning English

With the aim to reveal technical university students' attitude to playing games and learning English, quantitative and qualitative data was obtained from an online survey. The participants of the survey are first-year students of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". All the respondents (N=25), who volunteered to participate in the survey conducted in December 2022, had to study distantly because of the wartime in Ukraine. The students stayed in their hometowns, some were temporarily displaced within Ukraine or abroad. The survey consisted of sixteen items regarding students' attitudes to playing games in general, their English language proficiency, emotional and organisational aspects in particular. Using the Likert scale from strongly disagree (SD) to strongly agree (SA), the researchers calculated the median (Mdn) and Inter-Quartile Range (IQR) of each item. Therefore, it was possible to demonstrate what was a typical response (MdN) and measure of spread of various responses (IQR). The last item of the survey was a request to describe student's favourite game, therefore the task was to produce a short written text.
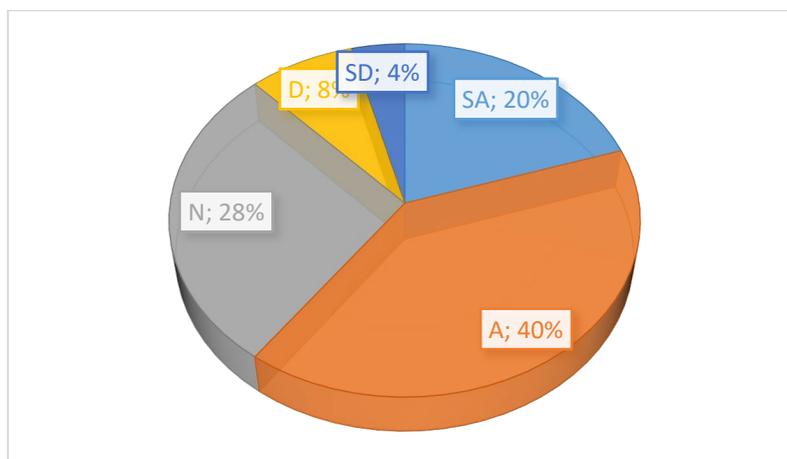
Responding to the statement about playing games in general, students analysed various aspects, which were important for them like visual gains, communication with others, immediate feedback, freedom of choice and freedom to fail. According to the results of the survey, respondents mostly agree with the statement that playing games is their favourite activity (Mdn=2, IQR=1) (See Table 1).

However, twelve percent of respondents do not consider playing games their favourite activity (Disagree or Strongly Disagree) (Fig. 1).

It is possible to suggest that these negative responses may indicate students' engagement in other activities more actively. Moreover, about thirty percent of students cannot decide, either to agree or disagree with this statement. Respondents are also indecisive about their attitude to such important features of games as social engagement and rapid feedback (Mdn=3, IQR=1). Respondents demonstrate the same

Table 1. Attitudes of technical university students to playing games and learning English

N	Statements	SA	A	N	D	SD	Md	IQR
1	Playing games is my favourite activity	5	10	7	12	1	2	1
2	The most important for me in games is visual status / points	2	6	9	6	2	3	2
3	The most important for me in games is social engagement	1	6	13	4	1	3	1
4	The most important for me in games is freedom of choice	7	14	3	1	0	2	1
5	The most important for me in games is freedom to fail	4	12	5	4	0	2	1
6	The most important for me in games is rapid feedback	2	4	17	2	0	3	1
7	Playing games in English develops my speaking skills	6	7	9	3	0	2	1
8	Playing games in English develops my listening skills	9	6	6	4	0	2	2
9	Playing games in English develops my writing skills	4	9	10	2	0	2	1
10	Playing games in English develops my reading skills	8	12	5	0	0	2	1
11	Playing games in English expands my vocabulary	10	11	3	1	0	2	1
12	Playing games in English levels up my grammar	2	11	6	5	1	2	1
13	Playing games relieves stress / fear	6	10	5	3	1	2	1
14	Playing games helps me with my studies	2	7	11	4	1	3	1
15	Playing games helps me with time-management	2	4	9	10	0	3	1
16	Playing games develops my cognitive skills	3	12	10	0	0	2	1

Figure 1. Technical university students' attitudes to playing games
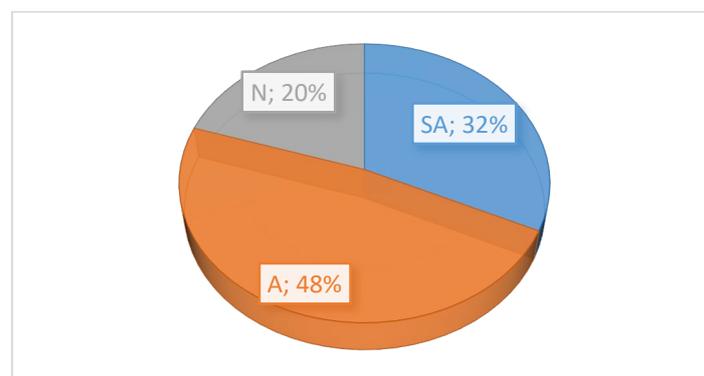
neutrality regarding visual status or points, but the opinions are more polarized (Mdn=3, IQR=2). However, their opinions about freedom of choice and freedom to fail are positive and less dispersed (Mdn=2, IQR=1) (See Table 1). According to the findings of another research, most students think that reward system helps them to learn new vocabulary in a natural way as it is motivating and changes their behavior (Herrera Rodriguez, 2018, p.65).

Considering skills development aspect, respondents reflect on their gaming

experience in terms of English language proficiency. Most respondents express agreement regarding positive impact of playing games on development of English speaking, reading, writing skills leveling up grammar and expanding vocabulary (Mdn=2, IQR=1), but opinions are more polarized concerning listening skills (Mdn=2, IQR=2) (See Table 1). The results of another research show that most students are sure that games help them to learn new words and expressions (Herrera Rodriguez, 2018, p.65).
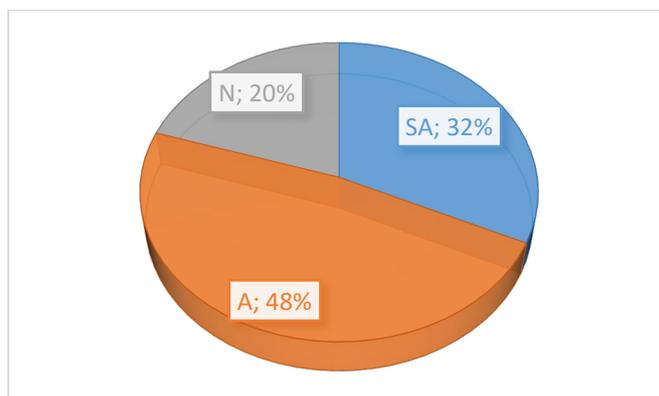
Analysis of the responses of students on development of their reading skills shows that more than two-thirds express their agreement, with twenty percent being neutral (Fig.2).

Figure 2. Technical university students' attitude to playing games and developing reading skills.

Regarding emotional and organizational aspects, students thought about their range of feelings related to playing games and the ability to keep "work-life" balance. Respondents neither agree nor disagree with the statements that playing games helps them with their studies and time management (Mdn=3, IQR=1). However, respondents indicate agreement with statements that playing games relieves stress, fear and develops their cognitive skills (Mdn=2, IQR=1) (See Table 1). Indeed, sixty percent of students indicate agreement with the positive influence of playing games on their cognitive skills, while the rest are indecisive about that (Fig.3).

The obtained results are in line with another research which states that using educational games improves students' English proficiency, influencing learners' positive attitudes intrinsically and extrinsically. Creation of a relaxing atmosphere alleviates cognitive loads and leads to lowering anxiety level (Li et al., 2021). The results of a similar research show that half of the students admitted that games were effective, whereas 35 percent had doubts about effectiveness of games as they were distracted and did not focus on learning. At the same time, practically all students

Figure 3. Technical university students' attitude to playing games and developing cognitive skills.

assured that games helped them to develop new skills (Bendo & Erbas, 2019, p.56). Being asked about games at their English lesson, a vast majority of students responded positively (Bendo & Erbas, 2019, p.58).

Writing about their favourite games, respondents shared their gaming experiences and preferences. It was impossible for some of the respondents to complete the task because they could not choose one out of many games. Some respondents claimed they do not play electronic games, only sport games, some were not sure if the activities they enjoy may be called games. Anyway, one of the reasons of playing games for respondents was "releasing negative emotions and communicate in English". Respondents shared a variety of favourite games, which could be divided into five broad categories: multiplayer games, single-player games, sport and logic puzzles, party games, and English games. The borderline between these categories is quite vague, as some party games may become English games if players choose the target language for communication (See Table 2).

Table 2. Favourite games of technical university students

No.	Category	Name of a game	Main features
1	Multiplayer Games	Counter-Strike: Global Offensive	Players are match-made into two teams, terrorists and counter-terrorist, who try to kill each other.
		Dead by Daylight	An action horror game, in which players choose a role of a killer or survivor, aiming at destroying others or staying alive. Violent content.
		Dota 2	An action real-time strategy game which involves hundreds of

No.	Category	Name of a game	Main features
			characters taking part in a battle.
		Rocket League	A player controls a car aiming at scoring more goals than the opponents.
2	Single-player games	The Witcher	Players identify themselves with various characters whose behavior is determined by the environment.
		Oxygen Not Included	A survival game, which requires application of scientific principles in order to create and maintain a space colony.
		Death Stranding	A survival game, which is set in a post-apocalyptic world where a player has to deliver necessities for people who live under ground.
3	Sport and logic puzzles	Sudoku	A player should fill the grid 9x9 spaces using numbers from one to nine.
		Nonograms	A player should fill squares in black and complete a picture.
		Dodgeball	The aim of this game is to hit your opponent with a ball.
4	Party games	Mafia	Players act according to their roles keeping their identity in secret, defending allies and destroying enemies.
		Alias	Players should define as many words as possible using descriptions, synonyms, miming, etc., to get more points and reach the finish space.
5	English Games	Quizlet live	Players should match the cards as quickly as possible, competing in teams or individually.
		Kahoot!	Players compete in teams doing quizzes on various topics.
		One sheep out	Players should guess a word according to its definition. One sheep is gone as soon as a player makes a mistake.
		What fit in a three-liter jar	The task is to name as many objects as possible which fit in a three-liter jar, each round starts with a new letter.

1. Multiplayer Games. Counter-Strike: Global Offensive (CS:GO) was chosen by the respondents because playing it provided an opportunity to communicate with their friends. Another reason was to kill the enemies and imagine that they are Russian soldiers who attacked Ukraine. CS:GO is a multiplayer shooter popular with both amateur and professional gamers. Players may be match-made into two teams, terrorists and counter-terrorists. It is also possible for players to choose teammates among people they know. The format of CS:GO is perfectly suitable for competitive gaming competitions with considerable prize pools (https://www.dictionary.com/e/pop-culture/csgo/). Another multiplayer game, chosen by respondents, is "Rocket League", which is possible to win by scoring more goals than the opponents (https://www.rocketleague.com/). One respondent loves "Rocket League" so much that confessed that the description of its various aspects "would take ages". A player has to control a car and it may seem to be childish, but with time the true sense of the game is revealed. "Rocket League" is described as "competitive and catchy", having "a friendly community and active developers". "Dead by Daylight", is a multiplayer action horror game the aim of which is to play a role of a killer or survivor. There are warnings about age limit as well as about the scenes not appropriate for some people because of the violent content (https://deadbydaylight.com/game/). "Dota 2" is a multi-player action real-time strategy (RTS) game which is free to play, millions of players take part in a battle discovering new strategies (https://www.dota2.com/home). "Dota 2" was often mentioned by students as an excuse for being late because they could not stop and played it all through the night. An explanation for that is that it involves hundreds of characters and requires learning "the gameplay for each hero", which is challenging to do, stressful and time-consuming. Nevertheless, a respondent loves it because he or she "can become the best" and be a winner. According to another respondent, "Dota 2" makes players waste their time and shatters down their nervous system, which may be somehow compensated by "friendly atmosphere and loyal attitude".

2. Single-player games. A Role-Playing Game (RPG) "The Witcher" assumes players to identify themselves with different characters and act accordingly in fictitious environments (https://www.thewitcher.com/en). It was ranked high by one of the respondents because a player has the freedom of choice when they develop the world filled with various characters, both positive and negative. Playing "The Witcher 3" it was possible to experience "friendship, love and separation". In addition, "an incredibly well-developed combat system" created an illusion that a player "becomes"

the main hero called Geralt. "Death Stranding" is a single-player survival game set on a mountainous terrain (https://www.ign.com/articles/2019/11/01/death-stranding-review). A player has to survive in a post-apocalyptic world delivering goods to people who are locked in shelters. Respondents list the reasons why it is their favourite game: the main idea of uniting humans, perfect visuals and music. One response provided explanation for the game "Oxygen Not Included" being the favourite: "there are countless systems that I build and have to keep running". Being responsible for what they created makes a game special for a player. "Oxygen Not Included" a single-player survival game the aim of which is to create and maintain a colony in space which requires applying basic scientific principles (https://metro.co.uk/2019/08/05/oxygen-not-included-review-deep-space-survival-10518351/).

3. Sport and logic puzzles. "Dodgeball" was chosen because respondents love ball games, and the main idea of this game is to hit your opponent with a ball (https://www.summercamppro.com/my-favorite-18-dodgeball-variations/). Some respondents started playing "Sudoku" and "Nonograms" because of the power cuts in Ukraine during the wartime, when there was no power, Internet connection for a couple of hours of even days, and even offline usage of gadgets was limited. Playing "Sudoku", an individual should fill the whole grid consisted of 9x9 spaces using numbers from one to nine. Skill levels of Sudoku players range from beginners to advanced (https://sudoku.com/). "Nonograms" look like grids of squares, they are logic puzzles which require a player to fill squares in black and complete a picture (https://www.puzzle-nonograms.com/).

4. Party Games. Another game mentioned by some respondents, "Mafia", was special for them because it has an intricate plot, develops communication skills, speaking and listening, besides, it "makes players think". The aim of this game is to win by killing others. The main roles are civilians, mafia, a narrator, detective and doctor, but all players should keep their identity in secret. The traditional rounds are called nights and days, each player acts their roles, developing strategies to defend allies and destroy enemies, which makes a perfect game for parties and holidays (https://www.kqed.org/pop/10178/how-to-play-mafia-an-in-depth-guide-to-the-perfect-holiday-game). A party game "Alias", which is also called "Tactic classics", is usually played in teams. The goal of the game is for each player to explain as many words for their teammates as possible, using descriptions, synonyms, antonyms, miming, etc. The players move forward as many steps on the game board as guessed words and the first team to reach the finish space wins (https://alias.eu/about-

alias/rules/). At the lessons students play in pairs or teams and consider this game a fun way of recognizing and memorizing words in English. They also play "Alias" at parties, but they usually use their native language.

5. English Games. One of the respondents was not sure what to call a game, sharing that they especially enjoyed doing exercises with "My Grammar Lab" Pearson Education, and "Quizlet live" (https://quizlet.com). English language learners use Quizlet sets of flashcards individually for learning vocabulary, but it is possible to play "Quizlet live" in teams of at least 4 players. The task is to match flashcards, for example, a word and its definition. In case of face-to-face lessons players are divided randomly into teams, find their teammates and play interdependently, because only one player has the correct answer at a time. However, playing in teams is not possible online. Instead, players compete with each other and as soon as one player completes all the tasks, the game is over and the winner celebrates the victory. "Quizlet live" game was favourite for some other respondents claiming that it develops their speaking skills and improves vocabulary. Following simple steps "create", "host or share" and "play", "Kahoot!" games are user-friendly in various educational environments (https://getkahoot.com). According to respondents, "Kahoot!" quizzes provide possibilities to compete with others, testing their knowledge and learn something new.

Other respondents' favourite game is "One sheep out", a vocabulary game, which is possible to play online when a teacher uses "Active Teach Speak Out", Pearson Publishing House (https://www.pearson.com/english/digital-tools/activeteach.html). Players should guess the word according to its definition and type it in the box. There are nine sheep and a dog in the background. If a player makes a mistake, one sheep is gone, therefore, each player has nine tries. The winner is the player who can guess more words and make fewer errors than others. The reason for playing a game "What fit in a three-liter jar", according to one of the respondents, is that because playing it "develops vocabulary and recharges the brain". The game starts with a player choosing a letter, task is for players to name an object which may fit in a three-liter jar. The winner is the player who manages to name the largest number of such objects.

To conclude, students are mostly fascinated by multiplayer and single-player online games, but other kinds of games like sport, logic puzzles, party and language games are also chosen as their favourite. According to another research, students enjoyed playing competitive online games in class more than the traditional ones (Herrera Rodriguez, 2018, p.64).

Conclusions

The potential of using games for learning has been recognized since ancient times. Using the principles, games designed according to, in various aspects of human life creates collaborative communities, increases productivity and empowers people. Technological advances opened other approaches in education to meet learners' needs and fully engage them. However, gamification is far from mechanical duplication of successful practices, it should be part of teacher training and curriculum design. It is impossible to use games effectively without understanding the driving force, which makes them so appealing for players.

Game elements, namely mechanical, personal and emotional, constitute the basis for engaging players. Needless to say that these three driving forces of a game are interconnected and balanced. Game mechanics like movement, resource management and spying, are regulated by rules and combined in different ways to motivate learners. Game dynamics, or personal elements, focus on by four personality types, who possess particular features and patterns of behavior. Constant interest of players is sustained by fixing the balance between four dimensions of a game: players, world, acting and interacting. Emotional elements determine direction and results of the actions, creating the state of "flow", when players are concentrated on the task being determined to achieve the goal.

Positive impact of using games in education is determined by the fact that besides learning the subject matter, students develop decision-making, problem-solving, communicative and cooperative skills, which are crucial in the 21st century. The importance of such game elements as incremental progression, when challenges increase gradually, onboaring, which is scaffolding, instant feedback, let alone of personal approach, collective responsibility and emotions of students is recognized and widely exploited by educators all over the world.

Learning foreign languages requires not only mastering grammar and learning vocabulary but developing language skills. A naturally playful environment is precondition for purposeful usage of the target language, developing communicative competences and achieving better learning outcomes. The results of the survey completed by technical university students demonstrated their positive attitude to using games in learning English, its impact on speaking, reading and writing skills. In this context students especially appreciate freedom of choice and freedom to fail. Respondents indicate agreement with the ability of games to relieve stress, fear and

develop their cognitive skills. Writing about their favourite games, students are mostly fascinated by multiplayer and single-player online games, but other kinds of games like sport, logic puzzles, party games and language games are also chosen as their favourite. To conclude, using games in education, in learning foreign languages in particular, offers a lot of possibilities yet to be explored and developed.

Glossary

Agency is a possibility of players to have meaningful choices which involves them into the game (Sheldon, 2020, p.38).

Alternate Reality Game (ARG) is a pervasive game which uses multiple multimedia to tell a story which depends on players' decisions (Sheldon, 2020, preface XXII).

Augmented Reality Games (AR) add digital elements to the real world which become visible by means of devices (Sheldon, 2020, p.8).

Avatar means an online representation of a person (Sheldon, 2020, p.12).

Backstory is the description of a character's life before the beginning of a game (Sheldon, 2020, p 116).

Boss Raid is an attempt of players to fight against a strong opponent (boss) (Sheldon, 2020, p.12).

Buff is permanent or temporary player's empowering by leveling or spells (Sheldon, 2020, p.81).

Camping means that a player stays in the same location to farm a mob as soon as possible (Sheldon, 2020, p.60).

Collateral learning happens when players are curious about a story while playing a game and learn something new without realizing that (Sheldon, 2020.

Downloadable Content (DLC) or Extension Pack means additional materials, items, areas to explore, etc. (Sheldon, 2020, p.81).

Dynamic Difficulty Adjustment (DDA) is the process of automatical changes on some parameters and behaviours in realtime which are based on the player's input or ability (Gamification and the Future of Education, 2016, p.12).

Edutainment is a combination of education and gameplay, which does not require monitoring of a teacher (Sheldon, 2020, p.13).

Extrinsic motivation inspires players to do something in order to get concrete

rewards, not fun (Sheldon, 2020, p.64).

Farming is fighting against the same mobs multiple times in order to gain levels and loot which are possible to sell in real world (Sheldon, 2020, p.41).

Fiero (pride in Italian) means the state of happiness caused by an ability of a person to overcome obstacles (Sheldon, 2020, p.12).

Flow is a player's mental state of total focus at hand; it is a technique and a goal of gamification (Gamification and the Future of Education, 2016, p.12).

Game Master (GM) is responsible for a gameplay in a multiplayer analog game: orginazes sessions, imposes rules, solves conflicts (Sheldon, 2020, p.36).

Gamification is the introduction or application of elements of games into non-game contexts (Gamification and the Future of Education, 2016, p.3).

Gamification is using game mechanics in other environments aimed at increasing engagement (Sheldon, 2020, p.5).

Guild is a community of online RPG players who have the common goals and play style (Sheldon, 2020, p.32).

Intrinsic motivation inspires a player to do something because they believe it is a right thing to do (Sheldon, 2020, p.66).

L337 or l33t speak is the name of the simplified language used by players, initially misspelled words, and then recognized as means of coding the words not nallowed in multiplayer gaming and messaging, e.g. "c" as "see", "u" as "you", "l337" as "elite" (Sheldon, 2020, p.28).

Leaderboard is a scoreboard for displaying the results of the players preface (Sheldon, 2020, preface XIX).

Massive Multiplayer Online game (MMO) refers to games that involve a great number of players from different countries who play interacting with each other and completing tasks (https://www.applovin.com/glossary/mmo-games)

Minecraft is a fantasy adventure game which had been used to teach a variety of subjects (Sheldon, 2020, p.88).

Mob stands for "mobile" which means an opponent generated by a computer, but not another player (Sheldon, 2020, p.4).

Modification (MOD) means an experience that is built from the assets and programming of another game (Sheldon, 2020, p.88).

Name, Physical description, Current life (NPC) is a brief description of a three-dimensional character, an individual player or a guild (Sheldon, 2020, p 113).

Onboarding is introduction or tutorial aimed at guiding a player at the beginning

of a game (Gamification and the Future of Education, 2016, p.7).

Pervasive game creates an illusion which turns reality into fantasy so that they look alike (Sheldon, 2020, preface XX1).

Player Versus Environment (PVE) is a gameplay when players fight against mobs which are called AI (Artificial Intelligence) (Sheldon, 2020, p.36).

Player Versus Player (PVP) is a gameplay when players fight other players (Sheldon, 2020, p.36).

Quest Chains are sets of quests logically connected (Sheldon, 2020, p 125).

Stalking is observing a person out of obsession or the desire to learn more about human characters (Sheldon, 2020, p 123).

The multiplayer class is a game played in real time in a classroom by students as players and a teacher as the Game Master (Sheldon, 2020, p.6).

Virtual Reality Games (VR) create imaginary worlds using 3-D devices (Sheldon, 2020, p.8).

Virtual world is a digital world experienced by many people simultaneously, which may be a game or it may contain games (Sheldon, 2020, p.55).

Wipe is a disastrous event in PVE or PVP when the players lose their points because of their opponents attack (Sheldon, 2020, p.39).