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Using Games to Build Social Emotional Learning Skills

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Abstract: This paper presents the results of a questionnaire-based study conducted at the "Vasile Alecsandri" University of Bacău, Romania. The study aimed at identifying students' perception of the impact of educational games on their social emotional skills. The objectives of the study are: O1. to highlight the connection between game-based learning and social emotional learning skills; O2. to identify students' perceptions of the effects of learning games on their social-emotional learning skills in the context of online education; O3. to systematise the main arguments for using learning games to build social-emotional learning skills. A questionnaire consisting of a series of closed questions answered by 200 students from different study programmes was used for data collection. The results obtained made it possible to determine both students' perceptions of the impact of educational games on their professional and personal development and to formulate suggestions for the use of games to build social-emotional learning skills in higher education.

Keywords: *social emotional learning; social emotional learning skills; higher education; games; game-based learning.*

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I. Introduction

Social and emotional learning (SEL) has been defined as a complex ability that enables emotion recognition and management, efficient problem solving, and building positive interpersonal relationships (Zins & Elias, 2006, p. 1). Viewed as a process, SEL implies acquisition and application of knowledge, attitudes and skills needed for emotion recognition and management, responsible decision-making, manifesting empathy and care for others, and handling difficulties successfully. SEL designates the "abilities to regulate one's thoughts, emotions and behaviour" (OECD, 2018, p. 15) that are essential to achieving academic success, employability, active citizenship and overall well-being. They include individuals' behaviour and feelings, approach to different tasks, and relationships with other members of the community" (OECD, 2021, p. 20). Learners acquire SEL skills similarly to how they acquire academic skills; having learners engaged in positive activities on a regular basis is essential to build and develop skills and use them in adapting to the increasingly complex academic, social, relational and health contexts that children face (Zins et al., 2007; CASEL, 2003). Recently, educators and parents have been paying increased attention to the relationship between academic performance and SEL as the latter designates a set of five key competencies that play a significant part in the learning process:

- *self-awareness* in terms of emotions, strengths, self-efficacy, and self-confidence;
- *social awareness* — empathy and respect for others, ability to apply multiple perspectives to various situations;
- *responsible decision making* — ethical reflection and assessment of alternative solutions;
- *self-management* — stress management, perseverance, goal setting and goal committment;
- *relationship skills* — communication, collaboration, asking for and offering help (CASEL, 2003).

Joynes et al. (2019) emphasize the inclusion of socio-emotional skills in the soft skills category, which are particularly necessary and useful for women and service sector workers.

The model that the OECD relies on to examine social and emotional skills is the "Big Five" model. It includes 5 categories of skillsets: "1. Task performance – self-control, organization, conscientiousness, reliability, persistence and setting high standards for oneself; 2. Engaging with others – tendencies to create and maintain connections with others, assertiveness and

positive engagement in life; 3. Collaboration – the quality of interpersonal relations; 4. Emotional regulation – understand and control their emotions, resilience and a generally positive worldview; 5. Open-mindedness – intellectual curiosity, creativity, a love of learning and tolerance, a tendency to self-reflect" (OECD, 2022, p. 25).

The report Global framework on core skills for life and work in the 21st century (International Labour Organization, 2019) systematizes studies showing that social and emotional skills are increasingly needed in the labor market in all economic categories, not just developed ones. However, they are important not only for the labor market, but also for achieving a decent standard of living, ensuring a deeper understanding in the learning process, stimulating the desire to study or for the psychological well-being of students" (OECD, 2021, p. 4). In the report 21st-Century Skills: What potential role for the Global Partnership for Education? A Landscape Review (Global Partnership for Education, 2020), the importance of socio-emotional competencies is highlighted 13 times in the text and the efforts that the world's nations are making or need to make on all continents to build them, including some examples of best practices from Latin America, Africa, Europe, and Asia. According to the document, the World Bank includes socio-emotional competencies in the category of transversal competencies and attaches particular importance to them in the 21st century competency profile, which is why it highlights some approaches that are having an impact in this area, both in pre-college education and in teacher education and training. In summary, SEL skills are "predictors of educational, labor and social outcomes" (OECD, 2021, p.7).

II. Problem statement

The COVID-19 pandemic has forced all educators to resort to online learning, with e-learning being a part of it for those students who are not able to participate in online classes in real time.

Besides the advantages (flexibility, time efficiency, and cost effectiveness) and disadvantages (lack of interaction, lower learner motivation, engagement and efficiency) of online education that the pandemic context has emphasized, there has also been a series of aspects that have come across as critical as a result of online education. These aspects are related to the students' dropping levels of emotional well-being and social-emotional skills. The lack of face-to-face interactions among learners and between learners and instructors is one of the major drawbacks of online learning (Islam et al., 2015). Student engagement is significantly

lower as students would rather work individually in online classes as compared to traditional classrooms because working in teams negatively affects their daily routine (Gilbert, 2015). Maintaining learner engagement and motivation in an online course is another major challenge for online learning. Highly self-motivated, independent learners with higher self-responsibility, self-organization, and technological skills have performed much better in academic performance in online education than low self-motivated students (Sarrab et al., 2013; Sarkar, 2012); instead, learners with poor self-regulation have submitted poor quality work or late assignments. Lack of face-to-face interaction during classes deprives learners of the stimulating context that provides them with the incentive to actively and creatively engage in the learning process, a process that involves exchanging information and ideas, building and negotiating new meaning, peer learning, building and maintaining relationships (personal and professional).

For these reasons, online education has severely impacted students' social-emotional skills and their emotional well-being.

The literature has highlighted increased relevance of socio-emotional learning skills to reduce anxiety and depression and enhance students' opportunities for personal and professional development and chances of professional integration; building SEL at young learners has been included among the finalities of a pedagogy for hope whose aim is to teach learners to adjust constructively to a changing, uncertain future and society (Marsay et al., 2021; Moradi & Chemelnezhad, 2021; UNESCO, 2021; UNESCO, 2019; Panayiotou et al. 2019; Feinstein, 2015; Zins et al., 2007).

The effectiveness of game-based learning (GBL) in relation to various learning goals and educational outcomes has been studied in different settings and pedagogical contexts. Results show that GBL tends to positively influence attitudes, promote better learning outcomes (Vogel et al., 2006) and cognitive gains (Young et al., 2012), positively affect motivation (Connolly et al., 2012) and the acquisition of problem-solving skills (Li & Tsai, 2013). There is strong evidence that GBL impacts 21st century skill development (Binkley et al., 2011).

Based on our previous research (Boghian et al., 2020; Mâţă et al., 2020; Boghian et al., 2019; Cojocariu et al., 2017; Cojocariu & Boghian, 2014) and the studies mentioned above (OECD, 2022; OECD, 2021; OECD, 2018), we propose the game-based approach to the teaching-learning process to help students build SEL skills.

III. Research questions

1. how does game-based learning foster social emotional learning skills at students (adult learners)?

2. how do students rate the effectiveness of game-based learning in building their social emotional learning skills in the context of online education?

3. what are the main arguments for and against the use of game-based learning to build social-emotional learning skills?

IV. Objectives of the study

O1. to show the connection between game-based learning and social emotional learning skills;

O2. to identify students' perceptions of the effects of learning games on their social-emotional learning skills;

O3. to systematise the main arguments for learning games to build social-emotional learning skills.

IV. Research methods

This article is based on a mixed methodology consisting, on the one hand, of a qualitative review analysis of the literature and, on the other hand, of a quantitative-qualitative analysis of empirical data collected by a questionnaire-based survey conducted by the authors between February and July 2021 at the "Vasile Alecsandri" University of Bacău, Romania. Given the research methodology used, namely a literature review and a survey-based approach, with data collected from participants by means of a self-report questionnaire, an ethics committee approval was not required. The questionnaire was elaborated and revised by the authors in collaboration with experts in the Sciences of Education from the "Vasile Alecsandri" University of Bacău, and the final form was distributed online as a Microsoft Forms questionnaire to students of different majors at the five faculties (Engineering, Letters, Natural Sciences, Economics, Exercise Sciences, Sports and Health). The questionnaire comprised 17 items on respondent data (3 closed items on gender, age, study program), 6 closed items on respondents' professional background, work experience, access to electronic learning devices and time spent in learning online, and 11 closed items on respondents' opinion regarding a series of statements and ratings of skills in relation to our current research topic. Of these, we have selected and interpreted the data from 6 closed items (10, 11, 12, 13, 14, 15) that are most relevant for the objectives of this study. The students gave their informed

consent for participating in the study, having been previously informed of the purpose of the study, the use of the data collected, and the withdrawing possibility, with no other consequences on their status. The responses to the questionnaire came from 201 respondents aged between 18 and 65 years, with the highest percentages reported for the age groups 18-23 years (22.4%) and 36-41 years (21.9%), followed by the age group 30-35 years (18.4%) and 24-29 years (15.4%); the gender distribution of the respondents is 16.4% male and 83.6% female. The data collected were analyzed using Jamovi 1.6 data analysis software.

V. Findings

V.1. The connection between game-based learning and social-emotional learning skills

Regarding O1, to show the connection between game-based learning and social emotional learning skills, the literature reveals that game-based learning fosters the building of the 5 key SEL skills (component elements of the Big Five model – OECD, 2022, p. 25).

Games may be defined as systems that engage players in an artificially created conflict and is organized according to rules that ensure an assessable result (Salen & Zimmerman, 2003). To understand how games may help build SEL skills, we must consider the main game elements, namely:

1) a *story* - the simulated context of the game;
2) *goals* that players must achieve, and challenges to overcome;
3) *rules* that guide players and challenge them additionally;
4) *interaction among players*;
5) *conflict* or *competition* that define the relationship among players;
6) *a sense of control* that players experience regarding the course of game events, and that motivates them to pursue goal achievement;
7) *player-responsive environment* to provide feedback on player's actions.

Many authors have identified the key features that games must have in order to be useful in educational contexts. Gross (2013) argues that educational digital games support learners' cognitive and intellectual development by their specific learning objectives. The educational relevance of digital games is ensured by: visual and auditory images/stimuli, the simulated environment, challenges and curiosity, all of these integrated to provide interactivity, challenge and competition, leanring, progressc and feedback (Garris, 2002; Malone, 1981). The learning objectives of a game may be formulated in terms of verbs such as: communicate, collaborate,

identify, decide, choose, analyse, interpret, select, prioritize, solve, find. The positive feedback offered to players as reward (e.g., upgrading to a new level, joy, sense of accomplishment) ensures motivation to keep playing. Some games engage players in a complex, experiential, multi-faceted social environment that require self-learning skills, learning transfer and multiple senses (Baptista et al., 2015). According to Van Eck (2006), educational games are efficient learning tools if they engage players in decision-making, achieve goals by overcoming difficult obstacles, and stimulate interaction.

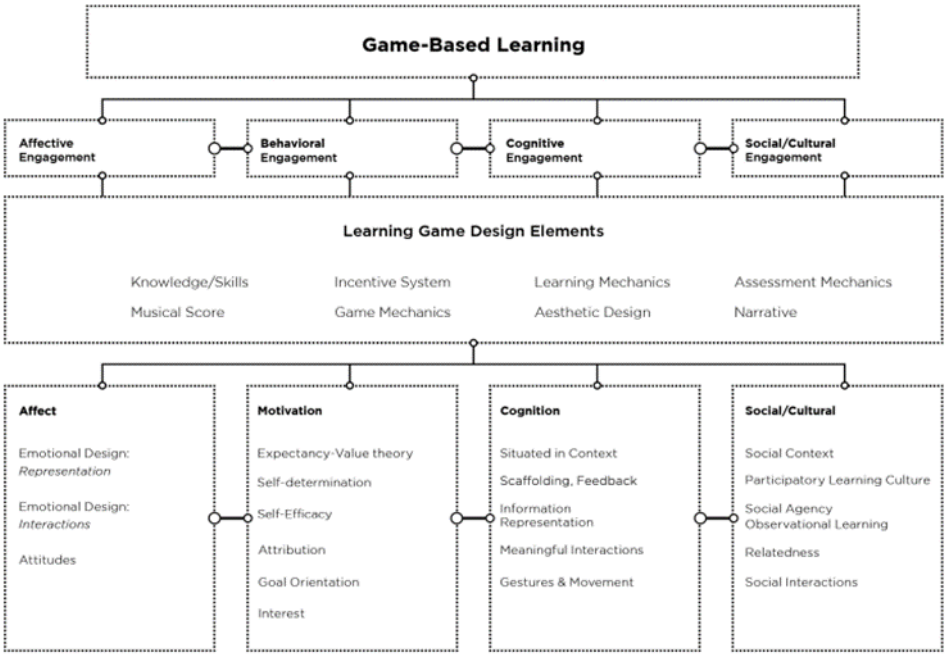


Figure 1. The game-based learning framework developed by Plass et al. (2015)

When discussing the use of games in education as a pedagogical approach, game-based learning (GBL) has been defined as a situational context that fosters knowledge and skills acquisition by problem-solving activities (gameplay) and accomplishment (game content) (Qian & Clark (2016).

For Prensky (2001) and Gee (2003), game-based learning implies learning through digital games. They stated that games can motivate learning and thus increase the chance of achieving the desired learning outcomes. Plass et al. (2015) define GBL as a collection of activities in which a learning task is redesigned to be more interesting, meaningful and ultimately more effective for learning than a non-game or gamified task. Plass et al. (2015)

developed a game-based framework that provides the theoretical basis for the approach (Figure 1).

There are a number of arguments in favor of using gamification in the learning process. These arguments highlight the skills and abilities that gamification promotes when used in teaching-learning activities, the five main SEL skills being among them:

(1) *Skills related to the thinking process*: a. Creative thinking (approaching a question or problem from different angles); b. Analytical and reflective thinking (analyzing and making judgments about what is happening);

(2) *Practical/organizational skills* (work planning, task accomplishment, resource management, handling crises and risks, making decisions, and solving problems, progress assessment);

(3) *Self-related skills (focusing for extended periods of time and thinking critically about the purpose and goals of* learning; acquiring, processing, and assimilating new knowledge and skills; and seeking guidance and support; self-management skills (being self-motivated, acting with confidence, directing and evaluating one's own learning, showing flexibility, taking initiative);

(4) *Skills related to others*: collaborating during the learning process; b. improving social skills and communication skills; c. interpersonal skills: Empathy, consensus building, negotiation, diplomacy, conflict management - resolving conflicts, respecting others, being a team player; d. Cultural awareness and expression skills (Boghian et al., 2020; Ince, 2018; Rugelj, 2018; Cojocariu et al. 2017; Vlachopoulos & Makri 2017; Rugelj, 2016; Clark et al., 2015; Faiella & Ricciardi, 2015; Rugelj, 2015; Tsekleves et al., 2014; Bellotti et al., 2013; Erhel & Jamet, 2013; Charlier et al., 2012; Connolly et al., 2012; Keesee, 2012; Young et al., 2012; Whitton, 2012; Milczynski, 2011; Anderson et al., 2009; Connolly & Stansfield, 2006; Sawyer, 2002).

V.2. Students' perceptions of the effects of learning games on their social-emotional learning skills

Regarding O2, to identify students' perceptions of the effects of learning games on their social-emotional learning skills in the context of online education, the students' perspective is that the game-based approach to teaching-learning fosters the building of the same 5 key SEL skills. As already noted, the data presented here are part of a larger survey in which some of the items were used for the purpose of collecting and analyzing other data. We present here only the results for the items that correlate with the O2 target in our study.

The answers to the item 14 *Online learning means a lot of stress to you* show that online learning causes some level of stress, or an average level of stress, as the high and very high options account for only 13.4% and the very low and low options account for 49.8%, or half of the options, plus the to some level option accounts for 36.8%. The correlation between item 14 and the age of the respondents reveals an interesting aspect: namely that the highest stress levels due to online learning are observed in two age categories: 18-23 (youngest students who do not cope adequately with this type of learning despite the digital literacy they claim to have acquired) and 42-47 (mature students with high self-expectations due to their professional, personal, and social status).

The results for question 10: *Which of the teaching methods used by instructors in online courses and seminars did you find most attractive*, showed the game method is in the top three methods appreciated by students, as follows: 1. the students' interest in the debate and conversation methods is highest (57.2%). 2. The didactic games, methods with game elements, are ranked second in order of interest (55.7%), while 3. the exercise method is in the third place, with a greater difference in attractiveness from the first two (38.3%).

Data collected for the item 15 *Do you think gamification of education through the use of learning games, teaching methods with game elements (scoring, competition, problem solving with rewards, etc.) is a way to reduce the stress associated with online learning?* has revealed that for almost half of the respondents, gamification of education can reduce the stress of online learning to a high and very high degree. Only 15.5% of respondents do not believe in the value of gamification to reduce learner stress.

Item 11 aimed to determine the impact of the use of educational games and gamified teaching and learning activities on building a range of 21st century competencies and skills: *Regarding games of any kind, didactic teaching methods with game elements, please rate the effectiveness of the use of teaching methods with game elements in online teaching in the formation and development of the following competencies and skills on a scale from 1 to 5, where 1 - to a very small extent, 2 - to a small extent, 3 - to some extent, 4 - to a large extent, 5 - to a very large extent).* The majority of the respondents' answers indicate that games of any kind and didactic teaching methods with game elements help learners to acquire all the competences and skills listed in the questionnaire, to a very high and high extent. The competences and skills included in the questionnaire have been selected based on the latest European official recommendations on lifelong learning key competences (Council of Europe, 2018; Council of Europe, 2017). From the list of competences and skills that students had to

evaluate in terms of how effective didactic games and methods with game elements are to build them, the following received the highest score for option 5 - to a very high degree: IT competences (47.3%); creativity and innovative thinking (44.8%); teamwork (36.8%); flexibility and prioritization (36.3%); working with deadlines (35.3%); creative thinking (34.8%); stress management (31.8%). For these competencies and skills, the next highest score is for option 4 - to a high degree, which means that students believe that didactic games and teaching methods that include game elements are very effective in building and practicing these skills. The highest score for option 4 - to a high degree was calculated for a number of competencies and skills; option 5 also represents the second highest score for these competencies: analytical and research skills (41.8%); autonomy and decision making (39.3%); communication (oral and written) (38.8%); critical thinking (38.3%); foreign languages (36.8%); negotiation skills (35.3%); human resource management (34.8%); domain specific competences and skills (33.3%); problem solving (33.3%); self-regulation (33.3%); entrepreneurship (31.3%); leadership (29.9%). For some competencies and skills, the difference between the score for option 5 and 4 is very small: stress management, leadership, self-regulation, domain-specific competencies and skills. The competence with the lowest score for options 5 (18.4%) and 4 (20.9%) is physical stress management: online learning does not promote the building of competencies and skills that require physical strength or effort.

In item 12, respondents were asked *to rate the effectiveness of the use of educational games and didactic methods with game elements in online teaching in the formation and development of a number of cognitive, skill and attitude dimensions of the educational act on a scale from 1 to 5, where 1 - to a very small extent, 2 - to a small extent, 3 - to some extent, 4 - to a large extent, 5 - to a very large extent).* The responses show that the highest percentage for option 5 - to a great extent was obtained from the effectiveness of learning games and gamified teaching-learning methods in increasing student engagement in the learning process (41.8%), followed by their effectiveness in helping learners acquire new domain-specific processes and procedures (40.3%), understanding and acquiring domain-specific knowledge (39.3%), promoting collaboration and cooperation (38.3%), promoting the communication of a large amount of information (35.3%); for all these items, the second highest percentages, quite close to the first, are the percentages for option 4 - to a large extent. The highest percentages for option 4 - to a great extent were obtained for the effectiveness of learning games and gamified teaching-learning methods to efficiently convey domain-specific knowledge (37.3%), to increase

learners' motivation (34.3%) and to increase learners' self-esteem (33.3); for all these items, the second highest percentages, quite close to the first ones, are the percentages for option 5 - to a very great extent. Therefore, according to the respondents, learning games and game-based teaching methods are very effective in building all the cognitive skills and attitudes mentioned above. Respondents' answers to item 12 also reveal their assessment of the potential of learning games and gamified teaching methods to reduce or eliminate feelings of alienation. According to the data collected, the highest percentages in this regard are for the fairly neutral option 3 - to some extent - with corresponding percentages for the other options as well. We may conclude that respondents do not think that games and gamified methods are very effective in reducing or eliminating feelings of *alienation* exacerbated by online education

The data collected for item 13. *Do you consider gamification of education through the use of didactic games, didactic methods with game elements (scoring, competitive spirit, problem solving with rewards, etc.) a must in the context of online education?* support us in stating that even though 47% of respondents think that gamification is a necessity in online education, we cannot judge whether this opinion reflects the view of the research group. This is because the 36% of students who do not think gamification is a necessity in online education are joined by the 17% who do not know how to deal with this issue. Therefore, the data on this aspect of our research is not sufficient to form a definitive opinion.

V.3. Using games to build social-emotional learning skills

Regarding O3, to systematise the main arguments for using learning games to build social-emotional learning skills, gamification is widely used because it works, and it works because it increases both intrinsic and extrinsic motivation. Gamification builds *intrinsic motivation* by providing an activity that *is fun*: learners like it, so the learning effort is voluntary and the outcomes are more significant (Dzeng et al., 2014). Gamification also builds extrinsic motivation because it means working on a task to get a reward. Both intrinsic and extrinsic motivation are important in learning: while extrinsic motivation serves the pedagogical purpose of sparking learners' interest and curiosity in the new topic/idea, intrinsic motivation is a catalyst for long-term engagement. The use of gamification strategies should be according to the dynamics of the teaching/learning activity: for example, badges and stickers can be efficient to encourage participation, and leaderboards create a competitive dynamic (The National Youth Council of Ireland - NYCI, 2020, p. 19; Rugelj, 2018; Rugelj et al., 2018; Rugelj, 2015).

The first thing to consider when implementing gamification is the structure of a gamified learning experience; this should include the following elements (European Youth Foundation - EYF, 2018, pp. 13-14):

- *Action*: the learner's activity is connected to the learning objectives; thus, a first step in gamifying a learning activity is to set the learning objectives and then select/design the activities for achieving them; the activities should motivate the learner;
- *Challenge*: a certain mission, quest, or challenge is assigned to the learner; this should be completed within a certain timeframe; this also implies a healthy dose of competition;
- *Reward*: upon achieving specific goals, learners are rewarded with either points or the possibility to progress one level, or positions on leaderboards; the reward/feedback is offered as soon as the task has been accomplished to foster motivation, self-confidence, and other feelings associated with achievement (pride, courage).

Other resources highlight the „recipe for meaningful gamification", namely (Reiners & Woods, 2015, p. 5):

- *Play:* this provides the opportunity to explore and fail within safe boundaries;
- *Exposure:* on the one hand, stories are created for learners and on the other hand, they are encouraged to create their own stories;
- *Choice:* giving learners the opportunity to choose for themselves during the activity is an important stimulus for their intrinsic motivation, reinforces self-esteem and autonomy;
- *Information:* game design and game elements should be used to encourage and support learners to discover and acquire new information;
- *Engagement*: learners are encouraged to learn from each other;
- *Reflection:* helping learners connect to their interests and life experiences to promote learning and engagement.

There are other "prescriptions" for the principles of gamification of the learning process (NYCI, 2022, p. 19):

- *Encouraging curiosity* as a means to increase learner motivation and engagement: Curiosity drives learners to find answers to a question, solve a problem/task, or figure out how to do something;
- *Stimulating imagination* through a story associated with an activity (e.g., humanity is threatened by an alien invasion).
- *Tracking progress and providing feedback* to show learners how far they have come in achieving a goal; "youth workers can track and visually represent accomplishments, which gives youth something to be proud of" (idem., p. 20) by using badges, stickers, and playing cards; to avoid making

stickers seem childish or school-like, stickers can be adapted to learners' ages and areas of learning;

- *Creating a sense of time pressure*, urgency, and even panic to make the activity more enjoyable, encourage them to focus on the activity and meet the deadline; unlimited time to complete a task can cause distraction and boredom for some learners, whereas giving a limited time frame for the work to be done and using huge ticking timers creates urgency and promotes a sense of efficiency;
- *Encouraging competition* to make activities more enjoyable and social, thus motivating learners. However, competition should not be used regularly because not all learners are equally competitive in all situations (e.g., some find competition more appealing when working in a team, while others find competition more stimulating when working individually);
- *Encourage discovery and adventure* to increase learner motivation and engagement through game elements such as treasure hunts or field trips (e.g., Geocaching14, a great outdoor activity where learners use a global positioning system on their smartphones or other navigation techniques to hide and search for containers called 'geocaches' at specific coordinates; or a city game where learners follow a route through the city to discover clues) (Bieszczanin, 2020);
- *Enhance teamwork* to balance skill levels, promote collaboration, and build teamwork skills; team-based competitions encourage learners to help each other: Each team should have time to build their identity as a team by establishing roles, a name for the team, and an identifying mark (badge, hat, armbands, etc.);
- *Sharing knowledge*, i.e., learners have the opportunity to share their knowledge and learn from others; many learners enjoy helping others learn;
- *Problem solving* in a group helps learners develop a range of skills depending on the task: artistic, general knowledge, athletic, logical, interpersonal, math, knitting, etc.;
- *Create challenges* to motivate learners to apply their knowledge to achieve the goals, even if they have difficulty achieving their goals. Challenges should be neither too difficult nor too easy, as either extreme will cause engagement to wane due to a sense of defeat or boredom;
- *Create a sense of ownership* by allowing learners to customize certain elements of the activity: individual end product, trading cards, badges, rewards;
- *Designing an avatar*: learners can be given the opportunity to design their avatar and use it for one activity or a series of related activities;

- *Learning through collecting and trading* to encourage learner motivation, engagement, and acquisition of knowledge and skills: e.g., collecting and trading cities that have certain characteristics to learn about geography, economics, literature, art, politics, tourism, etc. However, rewards should be used in moderation, as extrinsic motivation can hinder voluntary learning if used excessively. In other words: If learners expect to receive a reward every time they learn something, they will refuse to learn without a reward;
- *Engagement over time* can be achieved through the use of *leaderboards that show progress* on a particular activity or over a period of time. Scorecards can be physical or digital: To avoid demotivation from being too low on the leaderboard for a learner or team, a division can be made through competition, or simply different goals (different tasks but similar difficulty levels) can be set for each team;
- *Involvement in ongoing decision making*, as being able to vote on what should be done in the group gives learners a sense of choice: Learners could vote on which activity to work on from a set of tasks; voting counters, cards, or flags can be used.

As shown above, the principle of gamification of learning revolves around game elements that increase intrinsic and extrinsic motivation, and thus learner engagement, and help develop a variety of skills such as leadership, teamwork, working with deadlines, and improved self-awareness (self-efficacy and autonomy) (Prensky, 2001).

To analyse or design games, we should consider these four different game elements: *the narrative*, *the mechanics*, *the dynamics*, *and the aesthetics of the game*.

The *game narrative* is the story of the game. The story of the game attracts learners, connects them to the game activity, and motivates them. The story can be presented graphically or in words by the teacher or a team member. The mechanics of the game are represented by the rules of the game: rolling dice, moving pieces on a board, paying assets, trading pieces, etc.

The *game mechanics* must be logical: when designing a new game, it is safest to take inspiration from the mechanics of well-known existing games such as Monopoly or Activity.

Game dynamics refers to the action of the game: a race, a competition for assets, points, or avoiding penalties (going to gaol or having to sit out a round). The action of the game requires strategic thinking, discussion, and negotiation as learners think and talk about the consequences of the choices they make during the game.

Game aesthetics triggers learners' emotional responses: excitement, relief, panic, etc. In terms of emotions, games should help build empathy, mutual respect, solidarity, etc.

Simple games usually have manageable mechanics and dynamics, while in strategy games, such as Monopoly, new and more complex rules come into play as the game progresses (NYCI, 2020; Bevčič et al., 2020; Rugelj et al., 2018).

The quiz games used in schools with points, prizes, and leaderboards that incentivize winning and build healthy competition are an early example of gamification in learning (International Training Centre - ITC, 2022, p. 5). Gamification is not synonymous with games. Gamification borrows tools and techniques from the field of games to make experiences that are not game-like, and thus encourage players/learners to engage in certain behaviours with the ultimate goal of developing and practicing the skills that underlie human desire: socialisation, learning, mastery, achievement, and status.

Depending on the level of engagement and learning outcomes, gamification can be approached at three different levels (ITC, 2022; Rugelj, 2018; Rugelj et al., 2018):

- one can target individual game mechanics or use a specific isolated gamification element sporadically during activities;
- at the next level, one can use gamified experiences by implementing several game mechanics into a new or existing application throughout activities;
- at the next level up, there are the full-fledged learning games, which are in fact games designed to achieve a specific learning outcome.

The difference between games and gamification is that gamification is a non-game activity designed using game principles; real games teach players to successfully complete a specific activity, while gamification requires effort to solve more complex tasks; game-based learning is learning with and through games; gamification is learning through learning content organised according to game principles and rules (EYF, 2018, p. 13).

The tools for gamifying the learning process should be approached from three perspectives:

(1) tools for motivating learners;

(2) tools for designing a game or gamified teaching-learning activity, and

(3) the game as a learning tool (ITC, 2022; EYF, 2018; Macklin & Sharp, 2016; Reiners & Woods, 2015).

The tools of game design are the principles that help us understand the parameters of game design, much like colour, shape, position, and lines establish the basic parameters of visual art. From the literature, the tools for gamification of teaching and learning activities are tools that motivate learners; furthermore, games, game elements, and computer-based tools are tools used to gamify teaching and learning and increase learner motivation, engagement, and participation.

Many gamification applications in learning, education, personal growth, and development aim to increase learners' intrinsic motivation through the use of extrinsic motivational tools such as prizes, medals, avatars, and conquests (Reiners & Woods, 2015, p. 221). Game-based learning platforms have been used for years in various sectors to teach skills such as social awareness, negotiation skills, cultural knowledge, and awareness: *Food Force*, *Merchants*, *Our City*. By leveraging available technology, such games have a greater impact than other media and allow for quick and easy game development and dissemination (ITC, 2022, p. 7). There are already a number of digital applications that teachers and trainers can use to make their teaching-learning assessment activities fun: *Kahoot*, *Quiz*, *Wordwall*, *Padlet*, *LearningApps*, etc. Most of them are easy to learn and use in the classroom, and suitable for almost all age groups and learning subjects.

In our previous work, we elaborated a framework (Table 1) to help teachers identify and select the best games and game elements to gamify teaching-learning activities depending on their learning objectives (Boghian et al., 2020, pp. 189-190).

Table 1. Framework connecting games and game elements to learning objectives (Boghian et al., 2020, pp. 189-190)

Games/ gamified activities	**Pedagogical goals/learning outcomes**		
	Cognitive outcomes	**Behavioral outcomes**	**Affective outcomes**
Icebreakers	comprehension	participation; communication/interactivity; collaboration/coordination; reflection; feedback	engagement; enthusiasm; interest; satisfaction; recognition

Role-playing games, role-play (digital and classic) Computer games Board games, card games Current affairs quiz	experiential learning; knowledge acquisition; metacognitive skills (self-awareness, self-assessment); critical and analytical thinking; problem-solving and decision-making; spatial orientation;	perceptual motor skills; participation; team work; project management; leadership skills; organizational skills; adaptability; ability to solve conflicts; transfer of learning; social skills, further classified as immersion, scaffolding, communication/interactivity, collaboration/coordination, reflection, feedback	engagement; enthusiasm; interest; satisfaction; challenge; motivation particularized as self-efficacy, effort; self-assessment; recognition; emotions; attitudes
Colonization timeline	problem solving	Cooperation	challenge
Picture-to-story games	content understanding; critical thinking; knowledge retention; creativity	organizational skills; adaptability; reflection, feedback	engagement; satisfaction; challenge; motivation; recognition

To select the best applications, game elements and mechanisms for gamification of the learning process, we can refer to several models proposed and tested by researchers: these help us find the right way to gamify the learning process to ensure learner engagement and motivation without changing the learning outcomes and/or the level of task complexity.

One such gamification tool is the SAMR model, which was developed to help educators gamify their teaching-learning evaluation activities by incorporating technology, resulting in higher learner engagement, productivity and retention; it implies four lines of action that teachers should pursue to gamify the teaching-learning process through the use of technology:

- *Substitution*: technology is a tool, it does not functionally change the lesson; for example, the teacher instructs students to use Google Earth or Google Maps to locate a place instead of an atlas; therefore, what is the benefit of using technology instead of traditional tools?
- *Augmentation*: technology acts as a tool substitute and functionally enhances instruction by increasing learner productivity and potential in some way. For example, the teacher instructs students to use Google Earth to

measure the distance between two locations on a map instead of using a calliper or estimating using a scale;

- *Modification*: technology allows tasks to be redesigned, which also changes the learning objectives; modification means that the lesson is redesigned; for example, students are given the task of researching locations on a map using Google Earth layers;
- *Redefinition*: technology allows teachers to redefine a traditional assignment in ways that would not be possible without technology. For example, students used Google Earth to create annotated tours of a place and share their final product with other students (ITC, 2022, pp. 9-10).

The use of technology as a tool to gamify teaching-learning activities is not essential for effective gamification of teaching-learning activities. However, it is highly recommended to use technology-based tools in the classroom to help learners build digital and computational skills, which are key 21st century competencies.

In addition to technology, there are a number of game elements that can be incorporated into task design. The teacher can select one or more game elements to use depending on the learning objectives. For example, to ensure that the game elements work effectively, we should consider their impact on learners, the learning process, and learning outcomes (ITC, 2022, pp. 14-15):

(1) *storytelling*: adding a story to a teaching-learning task motivates learners to complete real-world tasks to achieve a story-related goal; stories make learning more lifelike and memorable and promote learner engagement; stories help develop creative, divergent thinking; an "Escape Room" game pattern, for example, implies that learners urgently need to complete a series of tasks to prevent a disaster (e.g., a flood, being trapped in a room, etc.);

(2) *roles*: by taking on a role, learners are immersed in the story of that character; role-playing encourages various skills and abilities in learners: creativity, empathy, resourcefulness, coordination, autonomy, time and task management, task sharing with members of the same team, out-of-the-box thinking, solidarity, etc.

(3) *points/scores*: points are a form of feedback offered to learners as a reward for accomplishments or desired behaviours, or a way to track progress; points can be used to motivate learners and keep them focused on the task (point deduction for errors or failure to meet deadline), to quantify performance levels, to record progress;

(4) *badges/certificates of achievement*: badges and certificates of achievement are another form of feedback that can be used for similar

purposes as points and assessments (e.g., as a requirement for learners to unlock additional content; badges and certificates of achievement can motivate learners to learn new skills (sewing, cooking, making fire, etc.);

(5) *collaboration/teamwork*: teamwork can be used to have learners work together to complete a task; teamwork promotes mutual learning, peer learning, and healthy competition; it motivates learners by creating a sense of belonging and striving toward a common goal; it helps foster each learner's unique personality by highlighting their role within the collaborative group; learners solve challenges together by learning new content and compete against others in terms of knowledge and skills.

Macklin & Sharp (2016) summarise a set of *game development tools* that can be used for gamification of teaching-learning activities. The 10 basic tools for gamification rely on combinations of the six elements of a game (actions, goals, rules, objects, game space, and players) to create endless possibilities for the learner experience: constraint; direct and indirect actions; goals; challenge; skill, strategy, chance, and uncertainty; decision-making and feedback; abstraction; theme; storytelling; and the context of game. These can be used individually or in combination to develop new learning activities.

(1) *Constraints*: the actions, goals, and rules of the game impose constraints on the players/learners, making the activity more fun and challenging; constraints promote a particular game experience that learners enjoy and find both challenging and satisfying; to better understand constraints, we can think of golf: hitting the ball with a stick to direct it into a hole, rather than simply taking it with the hands and playing it into the hole; "much of the satisfaction we get from playing comes from well-designed constraints" (Macklin & Sharp, 2016).

(2) *Direct and indirect actions* create the unexpected in a game; direct actions are those actions that allow the player to interact with objects and the space of the game; indirect actions occur without direct contact from the player or the objects used to perform the activity; for example, in a pinball game, hitting the ball with the flippers is a direct action, while hitting the ball against walls, ramps, holes, and other features are indirect actions; in other words, indirect and direct actions within a game or game-like activity can be considered as cascading actions that are more or less under the control of the player; direct and indirect actions give the game-like activity a lifelike image; another example would be to associate the learner's movements or direct actions with certain sounds (e.g., certain sounds for a correct or incorrect movement/action/response);

(3) *Goals* shape game experiences by giving purpose to player/learner actions; goals can be quantifiable, strong, and/or experiential, loose, and provide the reasons for players to follow the rules; both quantifiable and experiential goals motivate the player; for example, players changing the way a story progresses or the rules of the game based on a specific achievement;

(4) *Challenge* is the difficulty of achieving the goals or by the concepts embodied in the game; challenge is often approached with reference to Csikszentmihalyi's idea of the flow state, a state of high concentration and enjoyment; Csikzentmihalyi's flow chart describes what the relationship between your skill level and the degree of challenge feels like (Figure 2).

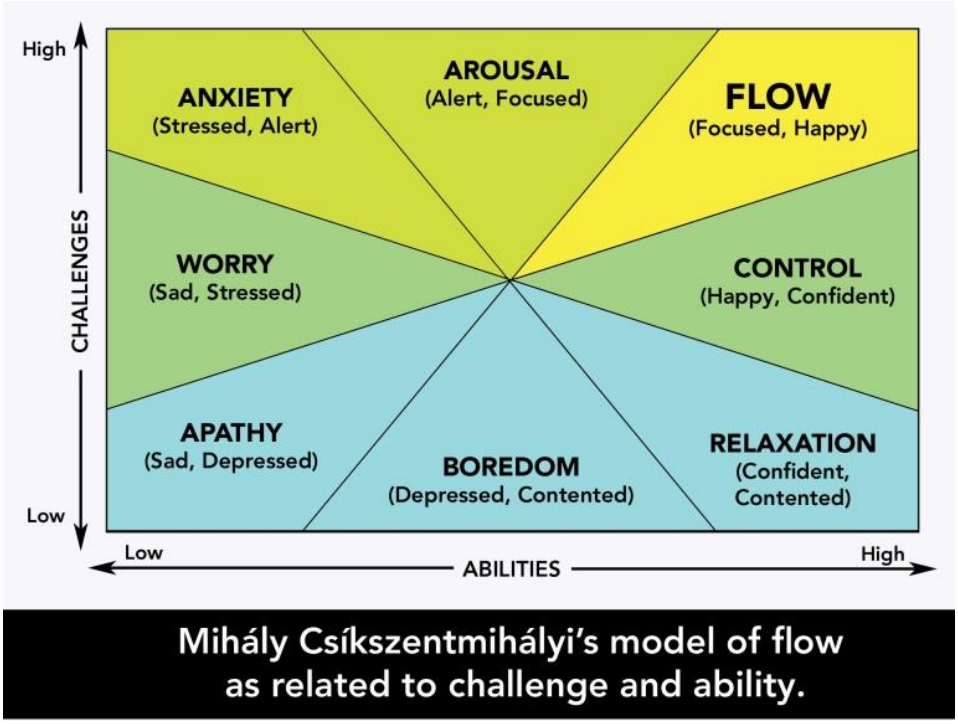


Figure 2. Csikszentmihalyi's flow chart (2013)

Flow theory is useful not only in the design of games, but also of educational activities. For example, an activity in which the challenge is high and the learner's skills are also high leads to a flow state; however, if the difficulty of the activity is high and the learner's skills are low, this leads to worry or anxiety (Sillaots, 2016; Sillaots, 2014) (Figure 3; Figure 4).

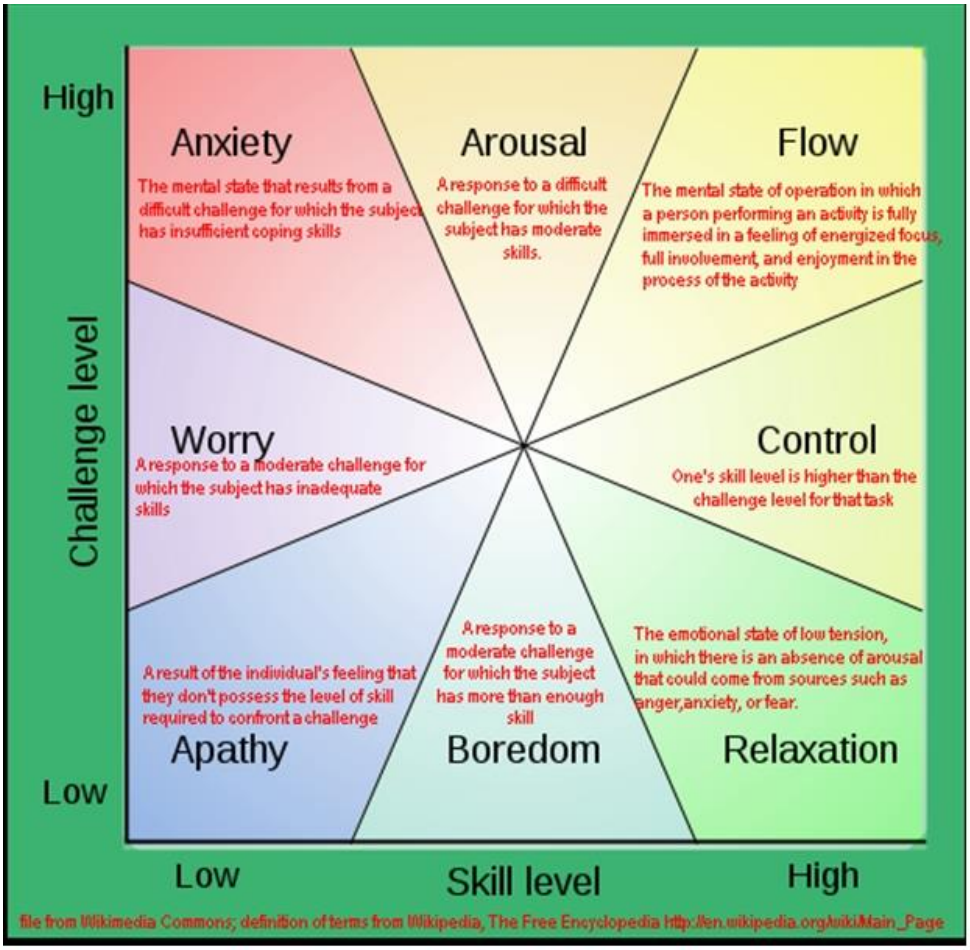


Figure 3. The flow states explained (Sillaots, 2016)

In the 1970s, Csikszentmihalyi began studying people who would engage in hobby-like activities on a regular basis: dancing, painting, gardening, etc. He concluded that such activities have intrinsic value which makes people focused, happy and relaxed, while progress is achieved effortlessly; the people involved in these so-called *flow activities* had higher levels of overall happiness and life satifaction (Csikszentmihalyi, 2013).

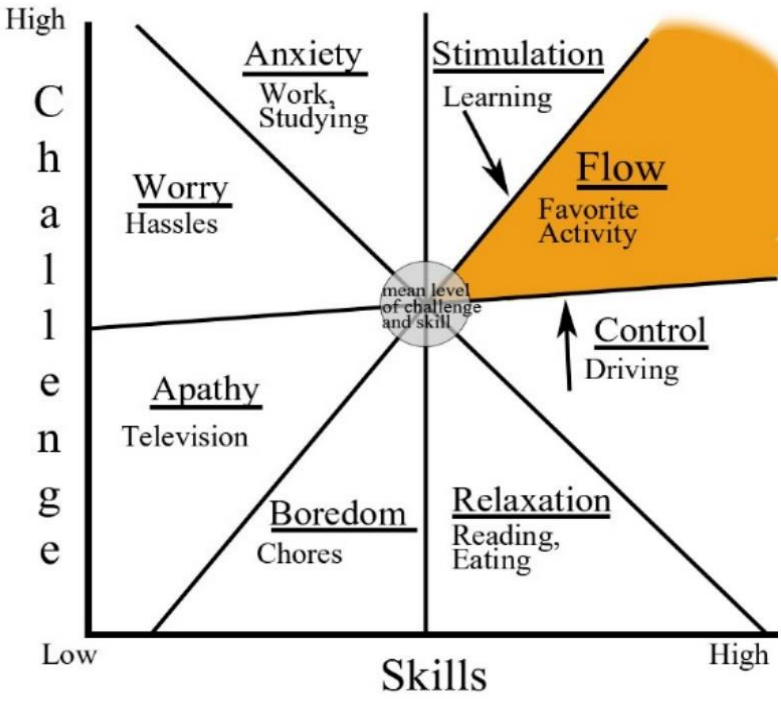


Figure 4. The flow states illustrated (Sillaots, 2016)

The flow chart reveals what learners need to stay motivated, focused, and engaged, which is to enjoy learning. In gamifying a teaching-learning activity, teachers determine the ideal level of difficulty for learners. It should be noted that flow does not guarantee a good gamification design, but it does contribute to a very satisfying experience for the learner that is linked to long-term memory. Flow can be experienced in a learning activity, but it is not the only type of experience learners can have. An alternative concept to flow that comes from challenge is absorption: players can become deeply engrossed in their gaming experience. The point is to use challenge while making the learning process playful to create flow and/or absorption in learners to foster skill development.

(5) *Skill, strategy, chance, and uncertainty*: Skill is the mastery of actions, while strategy is the learner's ability to achieve the goal(s); chance is the use of randomness in a game, and uncertainty is the feeling created by the unpredictability of what will happen during the game; an example would be giving learners the opportunity to draw cards, roll the dice, or hit a target with a ball and continue the activity, making their strategy dependent on the outcome of the card drawn.

(6) *Decision making and feedback*: during the game/game-like activity, learners make decisions about their next move/action based on the feedback the game/activity gives them. Games and game-like activities require learners to constantly evaluate what is happening as they continue to perform their tasks. This means that in a game-based learning activity, learners make decisions based on their actions and progress; one way to provide learners with the opportunity to practice their decision-making skills is to include turn-taking in the activity; another way would be to have learners make decisions against the clock. The decision-making- feedback loop gives learners an idea of the status of the activity.

(7) *Abstraction*: involves giving complex phenomena the form of a game by reducing the real game to an essential form, e.g., simplified maps of the world/city/region, player tokens, identity cards, color codes, decks of cards, rules;

(8) *Theme*: provides the logical framework for the representation of a game; for example, is it a war game, a parlor game, or a nature game? The answer cannot necessarily be deduced from the tasks, but from the roles that embody real-life occupations, positions, and functions.

(9) *Storytelling*: traditional narrative structures are often used as tools to create a game/playful activity. Storyworlds make learning more interesting and increase learner engagement by having learners play roles and perform activities through their character/avatar; sometimes learners develop their own story as they play/perform the activity.

(10) *Game context*: the context (when, where, with whom) in which the game is played; will the players/learners use their phones/tablets, will the activity be done in the classroom or in another location (lab, classroom and hallway, library, museum, etc.); the context frames the game and can change the nature of the game and create new variations and forms.

Learning is a process of meaning production through the acquisition of new information, the processing of experience, the linking of new information to prior beliefs, and the modification of behavior (Damon, 2004), therefore gamification of the learning process should be made meaningful. According to Mezirow (1991), transformative learning engages learners in searching for meaning, a process that depends on learner needs, interests, and abilities. Helping learners search for meaning in non-game learning activities (Kotini & Tzelepi, 2013).

By considering the principles and tools for gamification of the learning process presented above, we ensure that learners design their own learning process and take responsibility, as well as credit, for achieving learning goals; furthermore, gamification of the learning process ensures that

all learning styles are covered. Offering external rewards as a behavior control lever is not a student-centered function; it may generate negative feelings and gamification may prove to be meaningless. In order to select the most effective tools for meaningful gamification, the teacher should always ask the following question when designing the gamification process: "What does the student achieve?"

When designing meaningful gamified learning activities, the assessment dimension is also essential: the game score itself cannot be considered an assessment of the extent to which learning objectives have been met. In addition to the game score, the learner should be provided with a descriptive formative assessment of his or her learning process so that he or she can chart his/her learning route and goals; goals may be constrained to ensure that they are achievable based on the learner's knowledge and skill level (Chen et al., 2011). Compliance with the indications above ensures meaningful gamification as opposed to meaningless gamification. In meaningless gamification, the activity considers curriculum goals and needs, and disconsiders those of learners. One threat to meaningful gamification is the overuse of extrinsic rewards, which is in fact based on achieving a certain learning outcome within a small time interval. Another threat to meaningful gamification is the focus of the design on what is easiest to apply without consideration of the needs and goals of the learners (Nechita et al., 2019; Reiners & Woods, 2015, p. 224-226).

To ensure meaningful gamification, there are several design values worth considering. Design values are defined as the qualities and characteristics we want to embody in the game and in the game experience. According to Nicholson (2015; 2012), the design values for meaningful gamification are those listed below; indeed, upon closer examination, these are the tools we have identified as most effective for gamifying the learning process:

- *Experience*: what can the player/learner do and how does it make them feel physically and emotionally?

- *Theme*: what the game/activity is about and how it is presented to the player/learner; the concepts, perspectives, or experiences and how they are communicated to the learner (story, metaphors, systems modeling, etc.);

- *Point of view*: what the player sees, hears, or feels; the cultural reference point? The way the game/activity and information are presented (simple graphics, stylized geometric shapes, detailed models, etc.);

- *Challenge*: the challenges that the gamified activity presents to the learner (mental, physical, perspective, topic or theme challenges);

- *Decision making*: the choices the players/learners must make, how the choices are presented, how many choices the players must make over the course of the activity to complete the task;

- *Skill, strategy, chance, and uncertainty*: the skills the learner practices and builds during the activity; whether strategy development, chance, and uncertainty are present and relevant to the learner's experience;

- *Context*: who is the player/learner; where, when, and why do learners engage in the gamified activity; and who developed the gamified activity;

- *Emotions*: the emotions that the gamified activity may evoke in the learner.

The design values described above are guidelines that the teacher designing the gamified learning activity must consider. They are tools to ensure that the process of gamification of learning is focused on the learning objectives and the needs of the learners.

A good example to illustrate how educational games can contribute to building the 5 social-emotinal learning skills described in the introductory section based on the literature and discussed based on the students' answers to the questionnaire we have applied is the *Planet Hexagon* board game created as an intellectual output in the GameIT Erasmus+ project.[1]

The game *Planet Hexagon* is a board game that engages team members in cooperation, and teams in competition. Each team has to build a community by accumulating hex tiles representing Fields, Forests, Water, Houses, Public Buildings, Farms, and Factories. Various combinations of hexes result in a different number of points. The team with the most points wins.

Planet Hexagon introduces us into social problems of communities living in the imaginary world in a distant galaxy, which by metaphor, resembles our earthly contemporary reality with its vices and virtues, ups and downs. Each team takes on the role of one of the civilizations in the game: the Lupidians (engineers and inventors); the Arboretans (live in harmony with nature); the Harvesters (farming, relaxing, festivities) and the Urbanides (in pursuit of art, culture and high fashion). Each civilization develops its colony on their own board, but all players use one common Supply Centre and exchange Main Assets. Every community implements their own plan, however, its success is mainly guaranteed by sharing and cooperation with others.

[1] http://game-it.net/boardgame.html. Web 23rd of August, 2022.

The game also involves a series of roles that players in each team have to assume and perform: the Supplier (the most important role in the game, as the supplier is the one that chooses which tiles to bring to the colony from the Supply Centre), the Emissary (checks what other teams are doing and help plan the team's strategy) and the Builder (manages the resources supplied by the Supplier); each player in each team gets to play all roles as these change with every new round.

We have systematized the most important learning outcomes achieved by playing Planet Hexagon in relation to the 5 social-emotional learning skills aimed by our research (Table 2).

Table 2. Connection between Planet Hexagon learning outcomes and building ocial-emotional learning skills

Planet Hexagon learning outcomes	Social-emotional learning skills (OECD, 2022)	Social-emotional learning skills (CASEL, 2003)
making players sensitive to intercultural issues and stressing advantages of balanced development and cooperation between various cultures and teams characterized by diversity; making players aware of their strengths and the strengths of others	task performance – self-control, organization, conscientiousness, reliability, persistence and setting high standards for oneself	self-awareness
raising intercultural awareness and tolerance for differences: understanding other cultures, working in intercultural teams, representing different civilizations in the game, various points of view, observation, empathy	engaging with others – tendencies to create and maintain connections with others, assertiveness and positive engagement in life	relationship skills
improving collaboration skills: working together in a team, discussing the following move, deciding on where to put the tile, what to observe while looking at other teams' boards	collaboration – the quality of interpersonal relations	social awareness
developing communication skills in English and	emotional regulation – understand and control	self-management

communication and negotiation skills in general; building perspective shifting, perseverance and a sustainable development mindset	their emotions, resilience and a generally positive worldview	
improving decision making and negotiotion skills; developing strategic thinking: building strategy during the game, thinking about where and why to put the next tile, when to use special skill	open-mindedness – intellectual curiosity, creativity, a love of learning and tolerance, a tendency to self-reflect	responsible decision making

Conclusions

Our study aimed to (re)demonstrate the correlation between two interconnected realities: an educational one - the didactic method of the game and a psychological one (SEL). The connection between them was thought of and studied in terms of a relationship between cause and effect, trying to find out how the game method (through its characteristics and component elements) can contribute to the formation of socio-emotional learning skills. In addition, other very recent studies show that where it is more difficult to build/develop soft skills in traditional ways, we can succeed through games (Jaccard et al., 2022). After the conducted mixed research, we believe that we have systematized a set of arguments that: 1. underpin the relationship between game-based learning and social-emotional learning skills (O1); 2. illustrate students' perceptions regarding the impact of educational games on their social-emotional learning skills (O2); 3. show the main arguments for and against the use of educational games to build social-emotional learning skills (O3). All results obtained and presented are consistent with professional research data and with our observational data. The five key areas of SEL skills were selected from the literature and tracked under objectives O1, O2, and O3 to highlight the impact of game-based learning on their formation and development, both at the theoretical level and at the level of students' perceptions of this relationship.

In relation to O1 - the relevance of game-based learning on the development of emotional skills - we identified/systematized a number of aspects that develop as a result of game activities relevant to socio-emotional skills: 1. skills related to the thinking process: a. creative thinking (Jääskä & Aaltonen, 2022); b. analytical and reflective thinking; 2. practical/organizational skills; 3. self-referential skills; 4. skills related to

others: a. collaboration during the learning process; b. improving social skills and communication skills (Jääskä & Aaltonen, 2022); c. interpersonal skills: empathy, consensus building, negotiation, conflict management, team work; d. Cultural awareness and expression skills.

As for O2 - students' perceptions of the impact of educational games on their social-emotional learning skills in the context of online education, the data collected confirm their impact on the development of the same five key areas of SEL skills (Jääskä & Aaltonen, 2022; Riar et al., 2022). The high evaluation of the game method by the students also correlates with their recognized impact of this method on the development of the following skills: IT competences (47.3%); creativity and innovative thinking (44.8%); teamwork (Jaccard et al., 2022; Riar et al., 2022) (36.8%); flexibility and priority setting (36.3%); working with deadlines (35.3%); creative thinking (34.8%); stress management (31.8%)(data that has also been confirmed by other quite recent studies - Jaccard et al., 2022). The data collected also underscores the very large impact that gamified teaching and learning methods have on various dimensions of socio-emotional skills: increasing students' engagement in the learning process (41.8%) (Jääskä & Aaltonen, 2022), promoting collaboration and cooperation (38.3%), promoting communication of a large amount of information (35.3%).

Regarding O3 - the main arguments for using educational games to build social-emotional learning skills - we can state that both through the analyzed models, through some defining elements that were highlighted for a meaningful gamification (experience; topic; point of view; challenge; decision making; emotions), and through the presented application, they were brought to the fore connection between using eductional games, learning outcomes and building social-emotional learning skills.

The limitations of this study are connected to the sample size; the relevance of the study findings may be enhanced by further research to include larger samples of participants from domestic and foreign universities. This would also enable a comparative approach to findings across domestic and foreign samples. Also, further research directions may include an evaluation of the participants' social-emotional learning skills prior to having them answer the self-report questionnaire and drawing correlations between levels of objectively measured SEL skills and the self-report data.

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