Best Practices guide on European game-based teaching

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Abbreviations

TEGA - Training the Educators to Facilitate the Teaching and Assessment of Abstract

CoP – Code of Practice

GBL – Game Based Learning

GBT - Game-based teaching

HE - Higher Education

HOU - Hellenic Open University, Greece

HR - Human Resources

LSBU - London South Bank University, UK

NA - The National Agency

SG - Serious Games

ULU - Lusófona University, Portugal

VU - Vilnius University, Lithuania

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Abstract

IO1 involves documentation of existing European GBT and assessment of such practises in HE. This output combines two steps.

First step (Chapter 1) identifies the skills gap in the GBT and assessment area in Business and Language schools in the United Kingdom, Greece, Portugal, and Lithuania. The information gathered will become a base for creating e-learning and CoP solutions in the following activities of the project.

The report includes a literature review of existing academic and white paper material in Europe, within the academic sector and other industries such as the third sector, where they use the game-based tools for teaching, training, and assessment of the learning output.

This analysis extracts the list of competences for GBT and assessment.

It was planned that second step (Chapter 2) will include the written and visually documented case studies of the existing practice in Europe within the education sector in the fields of business and languages learning and other industries such as the third sector where they use the game-based tools for teaching, training, and assessment of the learning output. This includes interviews, reports, and showcases of the existing practice from the experts within the industry.

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1. Analysis and review on the existing literature of the existing academic and white paper material on game-based teaching and assessment in Europe

Regarding OI1 plan the first task was to describe the definition of the game, which later on will be used for the further steps of the TEGA project.

1.1. Definition of the game

Taking into consideration the context of TEGA project, we are offering the following definition of a game:

An activity that is voluntary and enjoyable, separate from the real world, structured by rules, and defined outcomes or other quantifiable feedback that facilitates reliable comparisons of in-player performances.

This definition has been chosen considering the following factors:

- Information sent by the partners.
- a brief overview of game definitions (Caillois, 1962; Frasca, 2007; Juul, 2003; Salen, & Zimmerman, 2003).
- Homo Ludens (Huizinga, 1955, originally published in 1938).

To fully analyse the concept of game, another central concept must also be explored, the concept of play. Although in some languages these words are not grammatically distinct, as they are in the English language, there is a clear conceptual distinction between them, but also an intrinsic relationship that has been extensively explored in the field of game studies. Considering the vision of Salen & Zimmerman (2003, p. 96), the way we interpret the relationship between these two concepts depends on the way we frame it. If we frame "games as a subset of play", the category 'play' can represent a broad set of playful activities, some of them are games, some of them are not. On the other hand, if we frame "play as a subset of games", games are seen as a process that produces play when interacted with. There is no right or wrong answer to the question "what is the relationship between games and play?". The way we frame it depends on the object and the aim of our critical analysis

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and, possibly, of ideological aspects, associated to each researcher's field of study (Frasca, 2007, p. 41)

Johan Huizinga's study Homo Ludens (1938) emphasizes the central role of play in human culture; his statement was supported by R. Caillois (1962).
Huizinga assumes that:

- where there is play, there is also "meaning"; playing makes sense to the player.
- playing is a medium where lived experience is organized as a structured situation.
- play is "free", which means that the fundamental motive of play is the experience that it affords.

Huizinga describes play as a free and meaningful activity, carried out for its own sake, spatially and temporally segregated from the requirements of practical life, and bound by a self-contained system of rules that holds absolutely.
Huizinga defines play as 'a voluntary activity or occupation executed within certain fixed limits of time and place, according to rules freely accepted but absolutely binding, having its aim in itself, and accompanied by a feeling of tension, joy and the consciousness that it is "different" from "ordinary life"'.

Based on the definition mentioned above, the key words that describe the game are:

- voluntary activity.
- fixed limits of time and place.
- rules freely accepted.
- having a joy.
- different from ordinary life.

Regarding Salen & Zimmerman (2004), "a game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome".

The games can be defined following the context:

- a simulation in which people are part of the model and their decisions partially determine the outcome.
- as a probability-based play integrating linear narratives.

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- an activity that is voluntary and enjoyable, separate from the real world, uncertain, unproductive (in that the activity does not produce any goods of external value) and governed by rules.
- a voluntary activity structured by rules, with a defined outcomes or other quantifiable feedback that facilitates reliable comparisons of in-player performances.
- it is an activity that includes rules for a purpose and provides people with the opportunity to enjoy themselves and socialize by taking them away from the tiredness of daily hustle and bustle.
- games are systems that include artificial conflict spurring play, win scenarios concluding play, and a rule-based system governing play and providing interaction for players.

However, we believe, that together with rules, separation from the real world it is important to emphasize voluntary involvement and enjoyable nature of the game. All this includes the definition given at the beginning of this section:

An activity that is voluntary and enjoyable, separate from the real world, structured by rules, and defined outcomes or other quantifiable feedback that facilitates reliable comparisons of in-player performances.

This initial definition will be revised throughout this paper to construct the best possible version.

1.2. Definition of the game: extended version

Regarding what definition of "game" to use as an exclusion criterion in carrying out a literature review of educational analogue games, the main issue is the vast number of research, scholarly, and industry projects and initiatives that are 'game-adjacent' and likely to present themselves as games, without being truly games in ways that fit the scope of the review and TEGA's purposes – big field, lots of nuance within it.

Given TEGA's intended use for the definition, we find the following considerations relevant:

- Serious games, including educational games, are either built from the ground up around instrumental outcomes or put in

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service of instrumental outcomes through means such as session-scheduling and a briefing and debriefing.

- The effect of what is genuinely a serious game as opposed to something that is 'game-adjacent' or 'game-seeming' and has incidental educational outcomes is that serious games educate through their rules and structure – the outcomes (in our case educational outcomes) are not incidental but instrumental, and integral to the game at the level of rules and player goals.
- A Commercial off-the-shelf entertainment game such as "Pandemic" (Leacock, 2008) is educational because of the qualities of its system design (goals and rules) and can be easily put to use in more formal educational settings.

In the literature review, initial results will likely include a sizable share of artifacts that claim to be games but are only interactive, or only playful. We propose that the literature review should pertain only to artifacts which are integrally rule-driven – that is artifacts/activities that are rule-driven, interactive, and playful, but not artifacts that miss the rule-driven aspect (even if they are playful), where this aspect is integral to the design and experience of the artifact.

We believe that we should use Juul's (2003) multidimensional definition of game as a checklist for filtering results of the review. This definition is syncretic (bringing together and answering multiple previous attempts to define 'game') and has a general scope (more recent definitions have narrower uses or are an explicit reaction to this seminal definition). Note that while the cited text emphasizes computer games, there is nothing in the definition to exclude analogue games (we present a criterion for analogue games at the end of this document).

The definition (Juul, 2003) comprises the following dimensions:

1. Fixed Rules: the playing of a non-electronic game is an activity that in itself involves trying to remove any unclearness in the game rules. A non-electronic and "folk" (i.e. non-commercial) game tends to drift towards becoming unambiguous, not in the sense that they don't require ingenuity to play, but in the sense that it doesn't require ingenuity to uphold the rules.

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2. Variable and quantifiable outcome: for something to work as a game, the rules of the game must provide different possible outcomes, and the game must also fit the skills of the players.
3. Valorisation of the outcome: some of the possible outcomes of the game are better than others, which creates useful, meaningful conflict (between players or between players and the system). This also means that the game has meaningful (in the game's own terms) explicit goals.
4. Player effort - games contain a conflict: it is a part of the rules of most games (except games of pure chance) that the players' actions can influence the game state and game outcome. The investment of player effort tends to lead to an attachment of the player to the outcome since the investment of energy into the game makes the player (partly) responsible for the outcome.
5. Attachment of the player to the outcome: attachment of the player to the outcome is a psychological feature of the game activity which means that there is a convention by which the player is attached to specific aspects of the outcome. It depends on the player's attitude towards the game; it is part of what we may term the "game contract" or lusory attitude that the player agrees to by playing.
6. Negotiable consequences: a game is characterized by the fact that it can optionally be assigned real-life consequences. The actual assignment can be negotiated on a play-by-play, location by location, and person to person basis. Even though the rules governing the stock market or elections could be used for game purposes, we do not consider them games, and though soccer is played professionally, we consider it a game because we are also aware that it is being played in non-professional settings.

Taken together, these six 'features' of dimensions will let us select games that are useful to our purposes, in the sense of games that educate through what they are as games (learning about things outside the game instrumentally), rather than learning being incidental to the activity (learning about the game, learning about things outside the game orthogonally to the game). Dimensions 1-5 exclude activities that are merely interactive or merely playful, and the educational outcomes consisting solely of learning about the

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game. Dimension 6 implies a degree of separation from real-life, and lets the game meaningfully exist as learning as opposed to the transposition of a non-game activity to a game-like or game-seeming context, where this constitutes learning as orthogonal to the game.

Regarding the 'analogue' game aspect, we believe that a simple criterion of excluding games that are fully digital or fully electronic, and that somehow require players to run game procedures through any extent of direct assembly of game materials will suffice; this excludes for instance VR games, but includes board games, locational games, and mixed-media and tangible games.

Another relevant aspect to be considered, even if not mentioned in Juul's (2003) definition is the notion that the relationship between play and meaning is crucial to a game, introducing the concept of meaningful play. This play mode happens when the relationship between actions and results is discernible, namely when the in-game action results are presented to players in a noticeable and integrated manner, on the scope of the game's broader context (Salen & Zimmerman, 2003, p. 49-51).

1.3. Whitepapers

A white paper (whitepaper) is an informational document, usually issued by a company or not-for-profit organization, to promote or highlight the features of a solution, product, or service. White papers are often written as sales and marketing documents used to entice or persuade potential customers to learn more about or purchase a particular product, service, technology, or methodology. White papers are designed to be used as a marketing tool before a sale, and not as a user manual or other technical document developed to provide support to the user after making a purchase.(https://www.investopedia.com/terms/w/whitepaper.asp)

The research on white papers in partners countries was performed, however we discovered that:

- Different countries have conceptually different understanding of the definition of white papers.
- The tradition of the white papers is completely different in different countries.

The UK has a long tradition of creating, developing, and using the whitepapers, and the LSBU provided two valuable examples.

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Example 1. **UK perspective of the games in education: Serious Games.**

Author: Mary Ulicsak

Affiliated organisation: Future lab

Website link: https://www.nfer.ac.uk/publications/futl60/futl60.pdf

Summary. This paper discusses the research around formal and informal gaming environment for education. The games are widely used outside the education sector, but their use is uncommon in educational context. It summarizes their current use and how teachers could be supported to use them effectively. This paper reviews the relationship between games, serious games, simulations, education simulations, and virtual worlds. The definition and usefulness of the term serious games and the underlying pedagogy in education games. It also discusses the assessment within games.

Introduction and rationale for research. The paper argues that the games will be predominantly used in the education sector. This paper discusses the role of game in educational learning context and the potential use of serious games in classrooms. It also discusses the effective and retention level of materials. It also presents evidence that technology favouring the use of games is improving which shall provide access to wider audiences. This paper provides information on the differences of games. It argues that there aren't any agreed upon definition of the serious games. This paper explains how the serious games engage by pedagogy. It also explains the adoption of serious games in multiple domains like military, health sector, commerce and corporate games, informal learning, serious games, and NEETs (young people who are not in education, employment, or training) and formal education.

Challenges of embedding serious games in formal education. The paper also sheds some lights on the challenges surrounding use and impact of serious games in formal education. Moreover, it presents three approach that are examined to illustrate the methods that could be used by those considering and selecting games as a teaching tool: Relevance, Embedding, Transfer, Adaption, Immersion and Naturalisation (RETAIN), the four-dimensional framework, and balancing game and pedagogy.

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Conclusion. There is little evidence to suggest how successful games are for subject and how they are used by the teacher. The teachers need to become more aware of what resources are available and how they can be best integrated and assessed. This paper also suggests that developers and teachers need to work together in order to agree not only to topics but also on the assessment metrics.

Example 2. **Learning in immersive worlds: a review of game-based learning**

Author: De Freitas, S.

Organization: CURVE (Coventry University)

Website link: http://curve.coventry.ac.uk/open http://www.jisc.ac.uk/media/documents/programmes/elearninginnovation/gamingr eport_v3.pdf

Summary. This paper discusses the uses of simulation games in education and how it has produced an increased interest in how immersive learning can be used to support educational practices. The perception about the simulation games being violent has changed because developers have realized the true potential of market for the educational games. This report presents the findings of a literature review alongside a set of case studies of game-based learning from everyday practice contexts.

Main elements of the literature review. The main reasons for engagement of learners are reviewed and critically assessed based on the current literature and what factors can lead to higher engagement of learners in game-based learning. This paper also addresses the obstruction such as lack of empirical data on the effectiveness and usefulness of games in practice. Barriers to using games are presented such as access to advanced technology and resources. Application of multiplayer online game is reviewed in terms of modern gaming methods and the cognitive tools which can be used to support online multiplayer games.

Key findings from the case studies. Examples of games as learning experience is assessed using case studies and their wide range of application for learning in immersive worlds. Game spaces are often highly immersive and can be collaborative. In the past

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immersive worlds have been used to support mainly professional development programmes in large number involving huge costs but today these approaches are adopted by schools and universities for small numbers of learners. Use of games are mostly being piloted in the secondary education in comparison to the tertiary education. Different modes of uses of games identified includes games: as metaphors, as tools for therapy and for rehearsal of skills, supporting high cognition in microworld and as open-ended space for experiments. This helps children and adults to simulate and empathize with people and rehearse different future scenarios. The perception of game being a leisure pursuit has changed and people are exploring the potentials for education purposes. Some authors argue that game and their uptake is tied to conversancy with new technologies which create generational perspectives to gaming. Game-based learning is often experienced-based or exploratory, and therefore relies upon experiential, problem-based or exploratory learning approaches. Role play and identification with virtual avatars are central to learning in immersive worlds, but learners need choice over characters adopted (Francis, 2006a). The design of game spaces and the use of games spaces are becoming closer as gamers start to modify games engines and use software development toolkits to add features and functions. However, one of the problems with modifying games is that the available toolsets are designed for leisure games which can affect development of games for educational purposes. Convergent forms of gaming are becoming more widespread, e.g. TV/games, mobile/games etc. Wider use of games technologies in the home is increasing the interest in the use of games in educational contexts, and in turn this is leading to increasing use of games particularly in schools and colleges, but also in universities. The serious games movement is a trend towards designing and analysing the use of games (and simulations) for supporting formal educational and training objectives and outcomes. The movement aims to meet the significant challenge of bringing together games designers and educationalists to ensure fun and motivation as well as demonstrating educational value. Through modifying existing games applications for educational purposes there is great potential for learning with games. This approach may have implications upon instructional / constructional learning design, as well as changing the traditional role of the tutor towards one of facilitator, collaborator, producer, or

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author. The approach of self-authored content may also promote greater opportunities for team and cross- disciplinary teaching and learning. The growth of online gaming and their communities may have uses for formal education, having the potential to provide greater support for learning outside of formal learning contexts and providing support for distance, lifelong and distributed learning groups. This trend may also produce more seamless learning experiences – lessening the hard lines between learning at work, home and formal learning institutions. Learning that follows from online experiences may place a greater emphasis upon team learning, collaborative learning and forming and maintaining dedicated learning communities of practice.

Conclusion. Games need to be embedded into practice to ensure effective learning. This needs to be embedded in accordance with sound pedagogic principles and design. Numerous researchers are required to produce evidence of how games can be used most effectively and evaluate the usefulness of the games and more baseline studies in order to quantify how much game-based learning and simulations are being used most effectively to support learning. There is a need of most effective supporting materials for educationist and trainers and also to raise awareness about resource allocation and improving the quality delivery of GBL. New developments such as the serious games movement are facilitating collaborations between academic, industrial and government agencies seeking to develop proprietary learning games. However, further work still needs to be done to bring the games development and education communities closer together to build shared vocabularies and expectations, as well as to inform new learning designs to support effective game-based learning experiences. The potential for educators to become involved in the development of learning content associated with these new games formats at this stage is substantial. This may be further encouraged using participatory development methodologies to ensure that tutors and learners have a greater say in dedicated content developed for games-based learning, and importantly to ensure compliance with sound pedagogic design principles as well as alignment with learning outcomes and assessment. The potential of game-based learning in practice can only be supported by a more coordinated approach to staff

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development and opportunities for buying out staff time to allow tutors time to explore and experiment with existing tools and game spaces. Game-based learning presents new opportunities for re-considering how we learn. Using immersive spaces, learners may produce their own materials, share learning experiences and rehearse skills for the 'real-world'.

The definitions of white and green papers **in Lithuania** are known for professionals who work for the European Commission. In order to provide a rationale and example for Whitepaper's perception and use in Lithuania, there is presented the following non-systematic equivalent used in the project framework.

Lithuania: Whitepaper's perception in the project framework. Game-based practices are applied individually, not systematically, individual documents of implemented projects are detected. For example, city municipalities are involved in or participate in projects and then organize certain trainings for school librarians or develop methodological guidelines on how to apply various games for teaching purposes in schools, but in higher education in Lithuania there is a lack of guidelines for the analysis or implementation of game-based teaching or serious games.

One of the analysed examples is Radviliškis district municipality and its training organized by the Centre for Education and Sports Services for librarians of urban schools to improve their competencies and for library readers (teachers and students) to help develop models for library services. Lego Serious play methodology was used in this training. According to the training organizers, this methodology "allows participants to understand the dynamics, to change the system with many different relationships on the personal side with four steps:

1. Challenges with questions – asking a question.
2. Construction.
3. Metaphor sharing.
4. Reflection.

Two-day sessions were organized for librarians (March 3-4, 2015) and two more-day sessions were organized with library readers (March 5-6, 2015) and models were constructed using Lego blocks.

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During the first day, participants constructed Lego models to reveal the changing role of the librarian, described them, and reflected on their collaborative, communication, and leadership competencies. During the team-building game, the participants were able to successfully build a model from Lego blocks according to the rules received for each participant. Only the second attempt was successful, and this showed that only one time of an explanation of the rules was not enough. During the third game, librarians had to imagine themselves in their work and unexpected results revealed. According to the organizers it happened due to the use of Lego methodology.

During the second day, 5 groups had to develop a Lego model for new library services using smart ICT. After creating and describing these 5 new services, the activity later took place in applying the Business Model Canvas. When participants presented their models, they did not quite accurately respond to the idea of the Business Model, as this activity was new to them. The organizers concluded that in this case more time is needed for explanations.

When the target audience was already the readers of the library (teachers and students of Radviliškis city and district schools), personal business models You canvas were created. After the reflection phase, participants noticed what they told about themselves was such information that they would not have traditionally told. During the next game, each reader, as in the case of librarians, was given twelve rules and, following it, without having to talk to each other, had to build a model out of Lego blocks. Like librarians, they only completed the task a second time. This revealed the importance of communication in the team also.

During the second day, a model about new library services was created and work was done on the Business Model Canvas. It was also a difficult task for this group, but with the help of Lego they reflected on the difficulties, and "the task helped them to understand and comprehend the possibilities of new smart ICTs and to design new, modern, attractive library services". After all the sessions, 5 services related to the application of ICT in libraries were discovered.

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HOU and ULU partners did not provide the material on this topic. To sum up the topic of whitepapers is important to notice, that the absence or extremely small number of the white papers in partner-countries shows a gap in the market, and this gap might exploit this by adding to out dissemination and impact – the policy suggestion/advise to the government and third sector.

1.4. Literature review

The important phase of developing intellectual output "Best Practices guide on European game-based teaching" was based on analysis and review of the existing literature of the academic and white paper material in Europe in the area of game-based teaching and assessment. As the essential part of academic research is literature review (Xiao and Watson, 2019), systemic literature review (SLR) was conducted as it supports better decisions for policymakers, is popular methodology for research to synthesize the literature and allows the collection of transparency data (Kraus, Breier & Dasi-Rodriquez, 2020). Based on the definition provided by these authors: "*An SLR is a review of an existing body of literature that follows a transparent and reproducible methodology in searching, assessing its quality and synthesizing it, with a high level of objectivity."* (p. 1026), this approach was also applied in this study.

Data source. As the main high quality data sources Scopus, PubMed, EBSCO (Academic Search Complete and Business search complete) and Science Direct online databases were selected, and search conducted in 5-11th of January 2021.

Search keywords and screening phase. The keywords used in search were synonymous with game-based learning or describing the type of game with the specific aim of selecting information in higher education and in business and language teaching: Conceptual games, Practice based learning, Board games, non-digital simulations, Interactive games for education, Game based teaching in HE, Serious games, Game based learning. Boolean search operators were integrated depending on database and the example of it as well as limitations and exclusion criteria are provided in the Table 1. The criteria of the literature review.

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Database	Search mode (Boolean/Phrase)	Limits (criteria)	Found
EBSCO (Business Source Complete)	game-based learning OR "game-based teaching" OR "serious gam*" OR "game-based teaching and assessment" OR "board gam*" OR "conceptual gam*" OR "educational gam*" AND "higher education" NOT SU gamification NOT SU digital games NOT SU video games NOT SU medical	Full text Scholarly (Peer Reviewed) Journals Published date: 2010-2020 Document type: article, case study Language: English Publication type: academic journal/case study	92
EBSCO (Academic Search Complete)	game-based learning OR "game-based teaching" OR "serious gam*" OR "game-based teaching and assessment" OR "board gam*" OR "conceptual gam*" OR "educational gam*" AND "higher education" NOT SU gamification NOT SU digital games NOT SU video games NOT SU medical	Full text Scholarly (Peer Reviewed) Journals Published date: 2010-2020 Document type: article, case study Language: English	406
Science direct	game-based learning OR "game-based teaching" OR "serious games" OR "game-based teaching and assessment" OR "board game" OR "conceptual game" OR	Year:2010-2020 Article type: research article Subject areas (Filter): Arts and humanities; business,	375

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	"educational game" AND "higher education" Title, abstract or author-specified keywords: NOT (gamification AND digital game AND video games AND medical) Note: Limited to 8 Boolean operators	management, and accounting	
SCOPUS	ALL ("game-based learning" OR "game-based teaching" OR "serious gam*" OR "game-based teaching and assessment" OR "board gam*" OR "conceptual gam*" OR "educational gam*") AND "higher education" AND PUBYEAR > 2010 AND SUBJAREA(BUSI) OR SUBJAREA(ARTS) OR SUBJAREA(ECON) AND DOCTYPE (ar) AND NOT gamification AND NOT digital AND NOT online AND NOT video		122
PubMed	ALL ("game-based learning" OR "game-based teaching" OR "serious gam*" OR "game-based teaching and assessment" OR "board gam*" OR "conceptual gam*" OR "educational gam*") AND "higher education" AND PUBYEAR > 2010 AND SUBJAREA(BUSI) OR SUBJAREA(ARTS) OR SUBJAREA(ECON) AND DOCTYPE (ar) AND NOT gamification AND NOT digital AND NOT online AND NOT video		3

Table 1. The criteria of the literature review

In total 998 articles were found. After the screening phase, based on such general information like title, subjects, keywords, abstracts 863 articles were rejected as not meeting the following criteria:

- the research was held outside the field of higher education and outside the fields of business and languages,

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- the article does not include game-based teaching, learning or assessment and does not meet the purpose or review.
- the articles are related to primary or secondary education.
- the articles are related to online games, digital technologies, information technology education, medicine, computer games, augmented/ virtual environment, virtual reality, health education, gaming, mobile games.

Total 135 articles left for eligibility analysis, i.e., full text and relevance checking. This was done by splitting the articles in equal parts to all partners and providing the framework for review. VU, LSBU and HOU analysed 34 articles, and ULU 33 articles; 85 articles left for further analysis. 50 form 135 articles were rejected: 26 articles were theoretical, 7 about not relevant topic, 14 articles discussed about digital games, 1 was not full text, and 2 in Portuguese language. The conduction of literature review was performed following Xiao & Watson (2019); Kraus, et all., (2020).

After in-depth reading of the academic articles all partners provided insights and findings using form, created by VU. The results of the literature analysis were documented in the excel. The framework for this created VU. The information gathered using this framework gives an overall picture of the involvement of GBL in HE processes. What is more, this well documented information can be used for further a long-term research project.

After reading the articles partners provided the general observations, which are useful for following reasons:

- as the basis of tendencies, similarities and/or differences, directions for further development.
- for preparation the interview questions.
- Material gathered presents the insights on the following issues:
- General findings after reading the articles.
- GBL study fields in articles in the analysed sample.
- Hypothesis which could be raised in a context of TEGA project.
- The important Fact to point out.
- Interview question(s), which could be offered for the next step – interview.
- Based on the articles read some ideas, why the games in a HE is used in such a small scale?

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The aim of the TEGA project is to delve into the situation and opportunities of the non-digital GBL in the HE sectors, therefore, only the findings relevant to this issue are presented below.

General findings after reading the articles. The summary below is made by reviewing the thoughts of all partners after reading the articles.

- Most articles are literature review (systemic, in general), not empirical. (VU)
- Teaching aspect is the one that is mainly approached through the application of GBL in HE, comparing to the Assessment aspect. (HOU)
- Only few articles mention the teaching paradigm. (VU)
- Very few articles explain how the game looks in the overall context of syllabus. (VU)
- Very few articles explain the methods and ways on how to design and to apply games in a learning process. (VU)
- Only few articles explain how to evaluate students; in this case the most common form of assessment is questionnaire. (VU)
- Authors are focusing on students' competencies only. (VU) (LSBU)
- There is no reference for specific measures to achieve inclusivity during the GBT procedure. (HOU)
- No article about the teacher competencies required to use the game in an attractive and efficient way. (VU) (LSBU)
- Uncertainty of terms and definitions: SG sometimes are referred to online games only. (VU)
- Games are used for improving skills such as motivation, innovation, and communication within students. But not much about the teacher/facilitators skills (LSBU)
- Games can be applicable for different grade level adapting to any (LSBU)
- Games can enhance the individual and organizational performance. (LSBU)
- Games are considered as voluntary activities and not considered as part of mainstream curriculum. They can also be considered to address some aspects of learning outcomes which can be assessed through attitudes and perceptions. (LSBU)

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- Articles reinforced the pedagogical value of GBL. Considering the insights of the studies, GBL was considered useful in several areas, and through different frameworks. (ULU)
- An increasing in students' engagement and satisfaction with the learning process is also an aspect to highlight. This is even more clear when GBL is used to teach subjects that students tend to see as boring, abstract, or too complex for them. (ULU)
- GBL is also discussed by the authors as a strategy that fits both the needs and the abilities of the students, while allowing connections between different areas of learning. (ULU)

GBL <u>study fields</u> in articles of the analysed sample. The TEGA project was determined to focus on the various language studies and business programs. However, the articles read covered a much wider range of programs, i.e.:

- Business: management, accounting, natural risks, economics and finance, business administration, entrepreneurship. Other fields: engineering, healthcare, medicine. (VU)
- Economics, Engineering, Sports management, Strategic management & Marketing management, Business & Accounting courses, and others. (HOU)
- Marketing, Climate Change, Finance, Joint Venture, Gender Studies, Engineering, Sustainability, Economics, Accounting, Environmental literacy, Organizational effectiveness and Performance, Languages. (LSBU)
- Acute care skills; personal hygiene practices; religion; probabilities and statistics; business management skills; mathematic skills; geography; law; history; human rights; engineering; and global economy. (ULU)

<u>Hypothesis.</u>

- GBL can reduce the gap between HE (theory) and working life (practical implementation). (VU)
- GBL can increase student engagement and thus improve their learning. (VU)
- GBL is a tool of soft skills' development. In addition to specific scientific areas or courses, GBL is used in topics such as: Change management, Business innovation, Product

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development, Organizational learning, Team performance, Creative problem solving, Project management. Learning these skills can be very useful in many other scientific fields. (HOU)
- Lack of formal methodology, guide and teaching assessment & mechanism leads to discontinuity of GBL practices (LSBU)
- GBL is discussed as a potential answer to promote learners' involvement, comprehension, cooperation, and motivation – crucial areas for the current teaching practices. (ULU)
- Board games particularly are seen as a feasible approach to deal with current issues with traditional/instructional pedagogical methods. (ULU)
- Games seem to teach through an experiential framework, by establishing constant parallels between the game dynamics and the formal contents to be taught. (ULU)
- GBL was also hypothesized as a relevant strategy to enhance students' confidence towards the subjects they typically struggle with. (ULU)

Facts:
- The ready to use tool for teachers is missing. (VU)
- There is a lack of comprehensive, clear, and simple guidelines, information and methodologies for the development and application of games in the teaching process. (VU)
- No clear guidelines how to assess the learning progress after using games. (VU)
- There is lack of methodology/guidelines on how to exploit games in the teaching procedure and then evaluate the learning outcomes. (HOU)
- There is no vanilla version of game-based design. There is no framework to look at the skills of the trainers. (LSBU)
- Assessment of performance with games in a learning environment as a learning tool is not considered. (LSBU)
- The lack of uniformity in the adopted concept of game, with studies using different tools labelled as games, but with very different characteristics. (ULU)
- Papers reported several outcomes that are not directly connected with measurable learning improvements, which include:

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- the promotion of hands-on experience, that can also be connected with experiential learning.
- the potential of analogical games to raise awareness to social relevant themes and induce attitudes changing.
- the promotion of problem-solving skills as transversal in the field of GBL.
- the promotion of interaction between peers through GBL, as a strategy to enhance participatory and collaborative knowledge building. (ULU)

- GBL approaches were also discussed as engaging, considering the usage of tangible materials, such as Lego blocks, that enhance concept visualization. (ULU)

Offers for interview. The question given below were offered to insert into the list of interviews, which is the next step of TEGA project.

1. Students evaluation: what is now? Could be maybe some alternative way, not scoring? (VU)
2. Teacher s competencies required for an efficient using of GBL (VU)
3. The importance of institutional approach regarding GBL (VU)
4. Why are the games used in such a small scale in a HE? (VU)

Why the games in a HE is used in such a small scale?

Despite the constant emphasis in the articles on the provision that GBL contributes to a better uptake of knowledge, there are lots of reasons why the games in a HE is used on a small scale. These include:

- Overall organization of the class in order to play the game (HOU)
- Significant preparation time in comparison with traditional lecture (HOU), (VU)
- Supply of (educational) game material (cards etc). (HOU)
- Specific approach to integrate a game in the curriculum. (HOU)
- There is no clear vision of what is to be achieved by playing the game which leads to difficulties in integrating them into the course. (VU)

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- -Traditional teaching approach still is understood as more reliable. (VU)
- Specific teachers' competencies (VU)
- "Ready to use" tool (VU)
- The instruments how the students can be evaluated after the game. (VU)
- Lack of systemized information about games, tools and methods. (VU)
- More information about advantages and benefits of games in teaching. (VU)
- There are no explanations given for the small number of participants in any game in the paper reviewed. (LSBU)
- The papers indicate effectiveness of games in small groups which can be managed by the facilitators, however it can be done in several small groups at the same time with many tutors. (LSBU)

Conclusion. Even though all articles state the undoubted benefits of GBL, analysis of the articles revealed a significant shortcoming in the study area, needed to be mentioned following:

- The lack of a strategic overall picture of how GBL may appear in the overall context of syllabus or the curriculum in general.
- Lack of common understanding of games importance in a learning process.
- Definitions' explanation is needed because some authors refer serious games to online games only.
- Lack of empirical articles in a GBL field.
- A minority of authors present the teaching paradigm.
- The knowledge and methodology are needed on how to design and apply games in a learning process.
- Students' evaluation strategy:
- How to evaluate the students after using the game?
- How to measure students' progress in a particular topic?
- How to evaluate the inclusivity of plyers?
- The teachers 'competencies required has not been discussed in the articles read; **there is a bold field for research, methodology and training.**
- A great heterogeneity between studies, not only on the field of studies, but also in the adopted methodology and, mainly, the

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data reported by authors also shows the lack of academic discussion in this topic.

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2. Interviews with experts with the list of competencies gained for game-based teaching and assessment

Interviews were conducted April-June 2021.The pandemic situation adjusted the planned opportunities of the interview performing. Remote teaching and quarantine dramatically adjusted the schedule of our informants, and we had to adapt to new conditions. Despite the force major mentioned above, we were able to gather valuable information for the next steps of TEGA project.

The final questionnaire, which is semi-structured interview [ANNEX 1. The questionnaire] is based on findings of the literature review and was created after discussions of all project partners. The final questionnaire contains 21 questions in total, i.e., 8 questions gather statistical information, and 13 questions help us to enrich the content of our topic.

Consent for participation in a research interview for TEGA project was created in accordance with the ethical principles of research. All interviewees participated completely voluntary. There is no explicit or implicit coercion whatsoever to participate.

Audio recordings of the interviews were made, and later after these recordings were transcribed.

General information about interviewees. Interviews for the TEGA project were conducted in all 4 partner countries: the United Kingdom, Greece, Lithuania and Portugal. All project partners surveyed 3 respondents in each country; 12 interviews were conducted in total. General information about the interviewees is presented in Table No. 2. General information about interviewees.

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Questions	Options	Answers
What is your Role?	Teacher	**10**
	GBL expert	4
	Game creator	4
Age group of the interviewee	20-30	1
	30-40	3
	40-50	**4**
	Above 50	**4**
Gender	Male	**7**
	Female	5
	Other	0
	Decline to answer	0
Years in practicing game-based learning	Average, year	**9,3**
Type of the game you are using/creating	Board Game	9
	Puzzle	6
	Card Game	4
	Role Play	**10**
	Other	2

Table 2. General information about interviewees

12 interviews were conducted in total, however there are 18 answers regarding the role of interviewee. There is more than one answer to the questions "Your role" and "The type of games you use in the audience / create", that is why the number of answers (N=18) does not match the number of respondents (N=12). The most common role mentioned by the interviewees is the teacher (N=10), the roles of GBL experts and game developers were indicated by 4 respondents each. The age group of the respondents ranged from 20 to 50 and more years: 4 respondents in the 40-50 age group, 4 respondents over the age of 50, 3 respondents in the 30-40 age group and 1 respondent in the 20-30 age group. 7 respondents indicated their gender as male and 5 as female. The average experience of the respondents in the application of training / games is 9.3 years. The types of games used / created are indicated as follows: role play - 10 answers; board game - 9 answers; puzzles - 6 answers; card games

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- 4 answers. 2 interlocutors ticked the "Other" option and mentioned team building / "icebreaker" and kinetic games that result from changing the rules of known board games.

Field of expertise of the interviewees. The interviews showed that the interviewees 'areas of experience are different and diverse, but it is also possible to find certain similarities. The answers of the interviewees' experiences are presented in alphabetical order in Table No.3. below.

	Board game design
1.	Computer science, business management and game designer
2.	Economics, business economics
3.	Engineering
4.	Environment
5.	Game science
6.	Game Studies
7.	Heritage
8.	History
9.	Interaction Design
10.	Lecturer, expert in humanities, language teaching, rhetoric specialist
11.	Management of HR, International Management of HR
12.	Modern board games
13.	PhD in commercial management
14.	Physical education teacher, specializing in Sports Tourism and consumer behaviour
15.	Psychology
16.	Serious games
17.	Spatial planning
18.	Specialization in Production Systems and Logistics

Table 3. Field of expertise of the interviewees

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The most often experience mentioned is related to the field of Social Sciences -, e.g., economics, management and business. 5 respondents indicated their experience in this area: HOU - 1, VU -1, and LSBU - 2. Experts‘ experience directly related to the games was indicated by 4 interviewees: LSBU -2, HOU – 1, ULU-1. No further similarities were found from the experiences of the mentioned experts, but the individual areas of engineering (ULU) and technology (LSBU), psychology (ULU), language teaching (VU), logistics (HOU), history and urban planning (ULU) were mentioned.

The study fields target audience, which is receiving GBL by interviewees, are quite extensive. All study fields of the target audience are presented below in alphabetical order in Table No. 4. Field of the studies of target audience.

1.	**Bachelor’s Degree in Video Games**
2.	Direction: business and management (Business and Administrative Studies)
3.	Employees (18-25 years old)
4.	Engineering and technology sciences
5.	Engineering management and general school subjects
6.	Games
7.	General (kids in basic education and parents)
8.	In the fields of humanities, languages, literature, rhetoric (content creation)
9.	Management and business (HR)
10.	Multidisciplinary for corporations
11.	Pre-graduate students in the 3rd, 4th academic year of their studies.
12.	Social sciences (economics, finance, marketing, business)
13.	Students in the field of social sciences
14.	Urban Planning Management

Table 4. Field of the studies of target audience

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The most often mentioned studies are from the field of Social Sciences, i.e., economics, management, finance, business, f.i. 4 respondents: VU -2, and LSBU – 2; 2 interviewees mentioned directly games related studies (ULU). Other mentioned fields of study are following technology and engineering (LSBU), urban planning management (ULU), language teaching (VU).

Detailed responses are grouped according to the responses of each project partner's informants, are provided below in Tables No. 5., No.6., No. 7., No. 8.

Questions	**Informants**		
	I	**II**	**III**
What is your role?	Teacher/GBL expert	Teacher	Game creator
Age group of the interviewee	30-40	Above 50	40-50
Your gender	Male	Female	Male
Years in practising game-based learning	Since 2010	2 academic years	-
Type of the game you are using/creating	Role play Other: Team building for companies/ice breaking games, mainly kinetic games	Board game Role play	Board game
Field of expertise of the interviewee	Physical education teacher, specialising in Sports Tourism and consumer behaviour	Department of business Administration in University. Specialisation in Production Systems and Logistics.	Board game design
Field of the study(ies) of target audience	Employees (18-25 years old)	Pre-graduate students in the 3rd, 4th	N/A

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		academic year of their studies	

Table 5. HOU interviewers' information

HOU interviewed 1 teacher, 1 game creator, and 1 teacher and GBL expert. The age of interviewers varies from 30 to 50+ years; 2 men and 1 woman participated in the survey. Interviewers use board games (2 answers) and role-playing games (1 answers). (I1) uses team building, "icebreaker" games. The field of expertise of the interviewers are following physical education, sports tourism, user-behaviour, logistics, production systems and board game design.

(I1) applies games to employees aged 18-25 year, (I2) uses the GBL with senior students. Game creator (I3) did not indicate to whom the GBL applies.

Questions	**Informants**		
	I	**II**	**III**
What is your role?	Teacher	GBL Expert	Teacher/ GBL expert
Age group of the interviewee	40-50	40-50	30-40
Your gender	Male	Male	Male
Years in practising game-based learning	10 years	11 years	4 years
Type of the game you are using/creating	Board game Puzzle Role Play	Board game Puzzle Card game Role Play	Board game Puzzle
Field of expertise of the interviewee	Technology and engineering operations PhD in commercial management	Game science	Computer science, business (HR) Multidisciplinary for corporations

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Field of the study(ies) of target audience	Engineering management and general school subjects	N/A	Management and business (HR) Multidisciplinary for corporations

Table 6. LSBU interviewers' information

LSBU interviewed 1 teacher, 1 GBL experts, and 1 person who is teacher and GBL expert. The age of the respondents ranged from 30 to 50 years, 3 men participated in the survey, and their experience in the field of games ranges from 4 to 11 years.

Respondents mainly use board and puzzle games (3 interviewees) and role-playing games (2 interviewees). The expert experience of the interviewees is different, it should be noted that the experience of management and game science, game design predominates. It is noteworthy that one interviewee (I1) applies games to students in the field of engineering and business management (I3). One interviewee did not provide an answer to whom the GBL applies.

Questions	**Informants**		
	I	**II**	**III**
What is your role?	Teacher GBL Expert Game Creator	Teacher	Teacher Game Creator
Age group of the interviewee	20-30	30-40	Above 50
Your gender	Male	Female	Male
Years in practising game-based learning	6 years	1,5 years	7 years
Type of the game you are using/creating	Board game Puzzle Card game Role Play	Board game Card game Role Play	Puzzle Card game Role Play Other

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Field of expertise of the interviewee	Modern board games Serious games Spatial planning Engineering Environment History Heritage Urbanism Games Studies	Psychology	Interaction Design
Field of the study(ies) of target audience	Urban Planning Management Games	General (kids in basic education and parents)	Bachelor's Degree in Video Games

Table 7. ULU interviewers' information

ULU interviewed 3 persons: 1 teacher, 1 teacher and GBL expert, and 1 teacher, GBL expert and game creator. The age of interviewees varies from 20 to 50 + years; 2 men and one woman participated in the survey. The years of experience in the GBL field ranged from 1.5 to 7 years. Interviewees use role-playing and card mainly (3 answers), board and puzzle games (2 answers). The fields of expertise of the Interviewees are following psychology, interaction design and different areas related to the game creation and development. One interviewee (I1) indicated a wide range of experiences, i.e., modern games, history, engineering, urbanism etc. One interviewee (I1) applies games to students in the field of games and urban management. One interviewee indicated the use of games for general education.

Questions	**Informants**		
	I	**II**	**III**
What is your role?	Teacher	Teacher	Teacher

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Age group of the interviewee	Above 50	Above 50	40- 50
Your gender	Female	Female	Female
Years in practising game-based learning	More than 10 years	More than 20 years	More than 20 years
Type of the game you are using/creating	Role Play	Board game Puzzle Role Play	Board game Role Play
Field of expertise of the interviewee	Economics, business economics	Lecturer, expert in humanities, language teaching, rhetoric specialist	Management of Human Resources, International Management of Human Resources
Field of the study(ies) of target audience	Social sciences (economics, finance, marketing, business), Engineering and technology sciences	In the fields of humanities, languages, literature, rhetoric (content creation)	Students in the field of social sciences Direction: business and management (Business and administrative Studies)

Table 8. VU interviewers' information

VU conducted interview with 3 teachers. The age of the interviewees ranged from 40 to 50+ years. All 3 interviewees indicated themselves as women. Experience in GBL field 10 -20 years. Interviewees mainly use role-playing games mainly (3 answers) and puzzle games (2 answers). The fields of expertise of the interviewees are following economics, human resource management, language teaching, rhetoric. Respondents apply games to students in the fields of social sciences (economics, business, management), language studies, literature, and rhetoric.

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Conclusion. As is seen from the information gathered, the answer of teachers is predominated (N=10), however 4 GBL experts and 4 game creators participated in our survey. It was not possible to interview all three target groups equally (i.e., teachers - GBL experts - game creators) due to pandemic, because remote work has changed schedules of our intended informants.

However, we conducted twelve interviews as planned in the project. The experience of the informants allows us to draw conclusions; their experience in the GBL field is extremely valuable and let us generalize, follow trends and delve into the chosen area.

Although we planned to focus on business and language studies at the beginning of the project, the literature analysis and all 12 interviewees confirmed that GBL can cover extremely wide range of studies.

Summary of open questions. The final questionnaire of semi-structured interview [ANNEX 1. The questionnaire] is based on findings of the literature review and was created after discussions of all project partners. The questionnaire of semi-structured interview contains 13 open questions. For the final summary selected following questions:

1. a) What students/audience's skills or behaviours are aimed and b) how are they assessed after playing the game?
   If not, why?
2. Which teaching skills/competences are gained by the tutors using games in a teaching process?
3. What is the significance of game-based learning over other pedagogical approaches?
4. a) What are the challenges you face in your game-based teaching?
   b) How did you solve it?
5. Are there any measures you take to ensure inclusivity of different players in your game(s)?
6. What other areas of teaching you might suggest for your game(s)?
7. What were the costs of developing/playing the game (financial/time-based / human-based costs)?

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8. What alterations your game might need in the face of the new pandemic and general interest towards online teaching?

The answers of three informants to the open questions of each project partner (in total N=12) are summarized and presented in the following order: HOU, LSBU, VU, ULU.

HOU, Greece

1. a) What students/audience's skills or behaviours are aimed?

Two of three interviewers mentioned the following skills: creativity, problem solving, collaboration, communication, teamwork (I1); (I2). (I2) mentioned analytical thinking skills, decision making, leadership skills, adaptation to changes" (I2).
All three interviewers agree, that games help to gain a deeper understanding of the topic, situation or processes, (e.g., business processes and functions (I2)). "The game is a simulation of business processes and functions. It is about the coordination and implementation of a production chain." (I2); „finding innovative solutions to the market demands" (I2); Civic and Social Studies (I3), and particular historical events „Greek revolution against Ottoman occupation" (I3).

I2 has pointed out cultivation of enthusiasm for achieving goals" – this is an important focus, which neuroscientists mention as a necessary motivation for further successful work.

1. b) How are they assessed after playing the game? If not, why?

All three interviewers do not provide any formal evaluation criteria or framework for assessment.

However, there always is informal assessment through discussion with the students, sometimes "as a focus group after the gameplay" (I2). I1 evaluates the behaviour of the participants during the game and collects feedback from participants after the end of the game. I2 applies "peer to peer assessment by the students as to whether the game achieved its goals" and submits "teachers' views regarding the educational experience". I3 says, that both games „are mainly created for leisure and not education."

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2. Which teaching skills/competences are gained by the tutors through the use of games in a teaching process?

The learning method is "experiential learning through a real-world problem" (I1); (I2); (I3). GBL "stimulates their critical thinking through the review of their in-game movements". (I2).

The main shift in a teaching competency was mentioned by (I2): teachers "become active trainers". It contains "the real learning needs of their students by leaving them free to learn, through playing", as well "understanding of students' real skills and personalized development of students' skills", "connection of the theoretical principles with the practical applications", which lead to "the differentiated learning".

These observations correlate with another response "communication skills, imagination and creativity are developed." (I1)

3. What is the significance of GBL over other pedagogical approaches?

The learning method is "experiential learning through a real-world problem" (I1); (I2); (I3). GBL "stimulates their critical thinking through the review of their in-game movements". (I2).

"GBL can enhance the learning process", says I3. "The educational subject and content become more tangible with the game", states I2. This the way of "learning by doing" (I2). "The students understand the multifactorial system they have to manage, they put themselves into the position of a professional in this field, formulate statements/ideas" (I2). GBL helps "the students are better prepared for the real market conditions" (I2).

What is more, "people learn without realizing it, by playing and having fun" (I3). "Insights for the abstract models, mentioned during the theoretical lectures, <…> become less abstract through the game." (I2)
The role of teacher is important, because for the maximum insights and efficiency "a good game should force the player to make

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meaningful choices within the game, <…> constantly put the player in dilemmas." (I3)

I2 summarizes that "the game seems to be a more effective way of learning and getting acquainted with the environment of a company as opposed to other ways. "

5. a) What are the challenges you face in your game-based teaching?

Regarding the (I1), the biggest challenge is to create a new game based on the new stimuli, f.i. "is to reshape the game" adapting the game to the particular target group"
(I2) mentions the language challenge in situation when the Greek students had to speak and play in English in a international group.

The main challenge is to create the learning environment. "Learning should come through fun by playing a game", says (I3), and "knowledge should not be associated with winning or losing in the game (I3)

4. b) How did you solve it?
This can be solved by good organization and preparation before the game (I2), (I3).

"This challenge was solved through the very good organization and preparation before the game, to make sure that all the game parts and materials work properly (I2). Also, "some preparation of the students in the classroom, before their participation in the game was useful." (I2).

5. Are there any measures you take to ensure inclusivity of different players in your game(s)?

All interviewers are aware about importance of inclusivity of different players (e. g. in terms of gender, race, color, body shape (I3), age (I1), mobility problems (I1), students with learning disabilities (I2), and colour blindness (I3)).

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Generally, the tutors facilitate everyone's involvement, says (I2)
(I1) finds out, that "it is a common phenomenon that people> 40 years old do not want to play". They are receiving special attention "who does not initially want to participate is asked to do it twice during the game". (I1)

Students with learning disabilities participated in the game, who were initially discouraged, but then they were very energetic and participated enthusiastically. These students were given +1 bonus grade. (I2)

(I3) offers, that "a game must be as language independent as possible", for example, "symbols should be used instead of many words" (I3) . This could be helpful some people with dyslexia, etc. For people with colour blindness, "which is a major problem for those who play board games, a colour identification system that uses symbols to represent different colours allows the players with any form of colour blindness to easily play. (I3)

6. What other areas of teaching you might suggest for your game(s)?

"In general, it could be suitable for training in any system involving processes and complexity "(I1), "teaching subjects that require critical thinking (I3).
In more detail, informants are mentioning "resource management" (I3), "training of business executives" (I1), "risk management, quality management" (I2). It could be used in the School of Physical Education and Sport Science, Business Administration departments. I1says "are always applied as an adjunct, not as the basic means of education."

7. What were the costs of developing/playing the game (financial/time-based / human-based costs)?

I1states, that the financial cost of one game creation can vary "from 500 to 30,000 €"
I3 states, that "depending on the type of game and if the play-testing are required, „then it might take ~6 months (full time) up to 1 year (part-time)."

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(I1) adds, that "an easy 1-hour game can be done in a few days. Larger projects for companies may take 6 / months."
The costs of the game development involve the following elements:

- many hours of preparation before the game (I2).
- the cost of the physical elements (watches / cards) of the game (I2).
- many hours to develop the scenario of the game (I2).
- it is very beneficial for games to do a lot of play-testing, which is time consuming though (I3).
- the researcher can participate as a partner (co-designer) in the development of the game (I3).
- extra staff may be needed outside the central team implementing the game (I1).
- training of game presenters may be required (I1).
- debrief is extremely important, that's why preparation time for the good reflection of the game must be counted.

8. What alterations your game might need in the face of the new pandemic and general interest towards online teaching?

The pandemic requires new rules: a lot of activities are moved to online space "The students could play asynchronously through a platform" (I2), "Special online platforms (e.g., Tabletopia) are used where a player can play board games online. <...> Players could communicate via teleconference systems" (I3)

However, I2 says, that "A digital version of the game could be possible, but the kick-off of the game must be done in person". I1 gives the preference for non-digital game and identifies additional tools necessary for physical presence play "the open space, with gloves, antiseptics, etc. which became parts (mechanics) of the game"

LSBU, UK

1. a) What students/audience's skills or behaviours are aimed?

(I1) says, that the skills and behaviours depend on each module. (I2) says, that the skills and behaviours depend upon the target

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audience. (I3) says, that the skills, behaviours, and competencies depend upon the context in terms of research and teaching.
(I2) identifies three main non-disciplinary skills; teamwork, communication, and problem solving.
(I3) states, that the type of skills, behaviour and competencies aimed during the games are based on the learning outcomes of the specific module and mentions collaboration and communication skills.

1. b) How are they assessed after playing the game? If not, why?

The general opinion of interviewees is that there is no formal assessment in place (I1; I2; I3) but informal discussion and interviews are conducted to evaluate how it affected the students (I3).

Observation is used to assess the effectiveness of game (I1) and to track different type of activities within games and their dynamic and what they can learn from it (I2). The teacher conducts assessment and observations, sometimes informal interviews and focus group to determine the effectiveness of games (I3).

(I1) believes that quantitative assessment methods are confusing, as they only ask if the students learnt or enjoyed the game and is more interested in knowing what the students have learnt and how their experience matched against the intended learning outcome. The feedback of the students is matched against the intended learning outcomes of the specific module.

The feedback from the students is useful for teacher in several ways: 1) to find the cues on which aspect of the learning materials and lecture were useful in playing the game; 2) to improve the game (I1) (I2) uses the Pre-post approach:" the students are engaged in understanding the basis of their learning, knowledge, competencies and behaviours and they will measure it during and after the game in order to see the differences in their skills, knowledge and competencies".

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(I3) says, that the teacher cannot assess the skill level of students based on limited interaction with the target audience, however there are a set of skills in mind based on assumptions.

However, the learning process is social, as people learn from each other during these encounters and they each have something to add as well. I3 concluded that the tutor's role is to summarise these points and reinforce the learning aspects.

2. Which teaching skills/competences are gained by the tutors through the use of games in a teaching process?

(I1) The teachers can learn to provide more engaging experience for students and developing comprehensive teaching methodology to target wider audience in classrooms. Their listening skill is also improved which helps to improve their teaching methods through student feedbacks. Moreover, teachers can evaluate how they will design, plan and deliver the intended learning outcomes. Most importantly they will acquire the expertise to understand how students will be able to deliver it. Using the Race model, the teacher is able to provide the platform so that students could assess themselves against the learning outcomes. The teacher is able to evaluate himself in understanding what skills to convey to students and how to make them competent in that particular area. It also enhances the perspective of the teacher towards use of technology and exploring innovative approaches. Furthermore, it can also enhance the writing skills and academic background in order to train others and contribute in the increase of knowledge. I2 The participants work is focused around helping educator and teachers to use GBL. The teachers are encouraged to co-create their own games, so they could be able to understand the process and the importance of balancing the learning and playfulness of the game mechanics and as well as understanding of how they can go wrong. The tutors have gained the practical experience of experiential and active learning. This has also given them sense of ownership, agency, and the knowledge in terms of connection between the learning aspect and the game aspects, and how it can be balanced in a lesson.

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I3 Facilitation and class management skill of the teacher is improved during these sessions. The teachers become vigilante in solving problems and swiftly getting to different group of students whilst facilitating the game. The teacher can also learn how to encourage students to trust the teacher and participate in class activities. Time management is another skill which is improved because the time is limited, and the teacher must deliver all the learning outcome within constraints. With iteration and practice the teachers becomes better in managing time effectively and estimating the time required for each activity. The teachers also learn how to evaluate the knowledge level of student overtime. Beside co-creation of games with students provides a lot of lessons learnt to teachers.

3.What is the significance of game-based learning over other pedagogical approaches?

(I1) GBL provides an outcome-based learning experience to students which cannot be done without games. Games and simulations put people in action to utilize their knowledge acquired in lectures or self-reading or learning from others. It ensues changes in their behaviours by looking at their peers involved in same activity. It has the visceral elements that provides a holistic learning experience to everyone. It also promotes engagement, and if structured properly, it can achieve all aspects of pedagogical model in a way that traditional lectures cannot. It provides a realistic scenario to students in order to understand the stakes, though nothing is at stake, but students can assess the realistic aspects created by games and simulations. However, it also induces dark side behaviours of negative competition among students too, and in those cases, it only becomes about winning, forcing them to look into loopholes in the rule of games

(I2) GBL depends upon the context of use and it cannot be the only solution to achievement of planned outcomes. There are many methodologies and pedagogical approaches that will allow to support different types of learning. However, GBL provides opportunity for learning contents and activities to be represented in a more engaging way, allowing the connection between abstract and concrete representations of topics to make it easier for someone to go through certain scenarios. GBL creates realistic scenarios and environments

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that may not be possible in real life, especially during the pandemic. It provides a levelling up approach to understand topics, the socio constructivism; they can actually happen during gameplay where the students learn from each other.

I3 emphasizes, that the GBL cannot substitute other pedagogical approaches. The idea that GBL is all fun and lectures are boring is incorrect. A fusion between these two would be the ideal way for teaching. The sessions of participant start with lecturing followed by game-based exercise with a reflection at the end by tutor based on the time available. The application of GBL in lecture is dependent upon the time factor and based on time different types of games can be played. For instance, for a 2-hours session, a user strategy game can be played, however for 45 mins such games cannot be played. There are not any sessions where only games are played, and it won't substitute the lecture completely. The games played should be outlined to students in terms of intended learning outcomes and must have context.

4. a) What are the challenges you face in your game-based teaching?

1. Scale (I1)

Scale is one of the biggest challenges to implement games in big classroom settings. Most games are effective for a group of 10 people but can be challenging to a big cohort with no prior experience. There are financial and physical resources required to play a game. Games for big cohorts involve dealing with information flow from the scale.

2. Time (I1); (I3)

(I1) The time and scale, these two relate to each other in terms of development and implementation of games. Most teachers are committed to other projects and priorities, so scale and time are the biggest challenges. I1 faced no organizational resistance to GBL application in lectures as a programme director.

(I3) The time, because creating games take time and resources. Scarcity of time and resources does not permit working outside hours to create and develop game.

3. No standard for assessment of games (I2)

Different schools use traditional way to assess students, so GBL has not been used in summative assessment so far. The games are

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assessed in formal setting in corporations only, but rarely in schools. Mostly formative assessment is done for games played and students are not graded.

4. The understanding the balance between the learning and the gaming in terms of pedagogical perspective verses game design (I2). There is a research gap in understanding the granular level of the relationship between the learning and games.

I3 has experienced organizational resistance in application of games because he was in a junior level position. The organizational buy-in and support to the junior level lecturers in GBL application remains crucial challenge. GBL is common but not common in mainstream education. The teaching assistants and junior members require support and buy-in from organization in using game-based teaching. There are instances where the module leader and course director have rejected the request of junior teaching staff.

4. b) How did you solve it?

There are several proposals on how the issues mentioned above can be solved:

- The educators need to be trained and empowered so that they can create their own games, in order to give them agency and sense of ownership. Through practice and iterations, they will be able to develop better games and will be able to understand how to balance the learning and gaming aspects in their lessons. (I2)
- Co-creation of games with students helps develop the game faster and it can also be used during the teaching hours, allowing leisure time for teachers. The co-creation of game with student is sustainable approach since the tutors are not overburdened with creation of game in private time. The junior teachers need to invite colleagues for demonstration of their games in order to get organisational support and also explain the objectives of games in line with learning outcomes. (I3)

5. Are there any measures you take to ensure inclusivity of different players in your game(s)?

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Apparently, there are not specific measures taken to ensure inclusivity of games (I1) and notes, that measures are taken to ensure teacher refrain from using slang and figure of speech unfamiliar to international students and their learning materials are checked by peers for clarity of academic English. The games developed cannot be played alone by introvert students and some games are quite complex with around 300-page portfolio of documentation and it also involves 8 or 10 people to run the game, therefore the nature of the game requires involvement of all players. In terms of extreme special needs such as dyslexic students, measures are taken but these cases are rare.

I2 discusses the most pragmatic way to ensure inclusivity: to co-create GBL resources. In this way the learners' needs are included in the design, development and implementation process. The teachers and tutors can observe and facilitate it to address the needs of everyone in big classroom settings and those who require further support. In a real setting "one size does not fit all and it will be costly to develop personalise games, but it can be mitigated by the facilitation of teachers during design, development and implementation process."

(I3) To ensure inclusivity the teachers need to be aware of their target audience learning needs so that students are not excluded to their different abilities. These are the lessons learnt from past mistakes, and assumption should not be made about the student's need. The better way would be to reflect upon it and evaluate their needs to ensure inclusivity. In most instances teachers need to do actual reading and research on how to eliminate the barriers in terms of language and these challenges can be dealt with by having the appropriate knowledge.

7. *What other areas of teaching you might suggest for your game(s)?*

(I1) The games are suitable to develop the soft and social skills of the target audience. Moreover, other skills can also be targeted such as self-efficacy, team working, relationship management, conflict resolution, dealing with complexity and ambiguity, leadership, communication, cultural awareness. The games would be applicable in any kind of discipline where these skills are required.

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(I2) It can be applicable to any areas of teaching, depending on the needs of that particular teaching. It can range from art to science-based subjects or any other areas of teaching depending on the intended learning outcomes. For example, the games created by the participant such as minigames for micro learning and virtual escape rooms for active learning; are replicable and are provided with guidelines on how they can reuse the open educational resources provided in terms of templates.

(I3) The games created are specific to each module. For example, games for computer science, law, management and physics, Lego serious play for law students. Therefore, the specific ones can only be applied in a particular subject, for which they are initially designed. If a game is designed for project management, then it cannot be applicable to law students and vice versa. However, taking the same mechanics and changing the contents to suit any modules would work. They can be adapted to any modules using the same mechanics of popular games.

8. *What were the costs of developing/playing the game (financial/time-based / human-based costs)?*

There is no definite answer, says I1 and I2. "It depends on different type and nature of games." (I2). I1 gives the Lego games example:

- the Lego materials cost £70.
- the game creator invested 60 hours in creating the game, which involved design, test, and implementation.
- the overall cost of the game amounted to total of £5,000, which includes meeting, work hours, materials, and the time other colleagues.
- the game creation took two weeks i.e., 60 work hours; the human costs were low due to the fun factor, because they enjoyed creating it.
- their colleague did a three-week induction game, and the human cost were quite high due to prolonged working hours, stress, accessing email activities, doubts, uncertainty and emergency meetings.

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I2 adds, that the quality of minigames for GBL purposes may not have high specs as entertainment games but they would require shorter time period to create. If they are based on narratives, 2D or 3D art, dialogue based and branching approach of stories, then the design process would take more time. (I2) gives example of the escape room game:

- it took two months' time to create from design, testing to finalisation.
- this time includes the GBL expert, designer and two lecturers involved in creating the escape room game.

In other instance, the creation of numerous minigames took four to six months with overall cost of £40,000, in which 35 minigames were developed. (I2)
I3 explains how the financial and human costs vary during the different stages of game creation. The costs are high during the initial stages of practice because a lot of preparation is required but they keep on decreasing once the tutors are confident enough. The development cost of game depends upon the intended objectives, learning outcomes and type of games developed. The analogue games such as Lego is comparatively cheaper than digital games. A Lego game can be played in £500, which includes the materials. On the other hand, the cost of developing board game can be cheaper, as it requires a prototype on pen and paper and £200 would be enough to develop the game.

8. What alterations your game might need in the face of the new pandemic and general interest towards online teaching?

"There are no alterations done and games have not been played during the pandemic", says I3.

The new pandemic time "requires manpower, resources and a new set of skills and expertise and most importantly time to learn something new, which may not be compensated", says I1. "There is inactivity of the games due to remote learning. It requires kinesthetics approach to play the game; hence they are being shelved during this time" (I1).

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I2 believes, that "An analogue or physical game can be played or facilitated online at different location with different players, who can play the same game, however it is a hybrid experience". GBL is by nature intended for physical play and cannot be digitized as it will lose its natural functions: "The reason GBL is used in learning process is about creating experience and engaging the learners in learning itself." The teachers should focus on creating the experience, not just going digital"(I2). There are new facilities , at least partly to help teachers in this time; e.g. "virtual escape rooms", "creation of minigames", "online tutoring tools available to create mini games, which can go along with the Moodle". (I2).

I3 mentions the online brainstorming tool "Miro", which can be a good suggestion to create simple version of board games, and which can be played online with students using post it notes and they would be playable. The excitement level would not be high among students, but it would be overall useful.

VU, Lithuania

1. a) What students/audience's skills or behaviours are aimed?

The interviewees are both those who create games and those who apply them in pedagogical activities. The traditional approach is to pursue different competencies and they may vary depending on the type of game and field of studies. Different interviewees emphasize different skills and behaviours: communication, mutual understanding, such as empathy, analytical thinking (I1), work in teams, share functions, represent summarized team opinion, apply the theoretical knowledge to solve specific (practical) situations (I2), creativity, teamwork, leadership, personal involvement in action, theoretical knowledge, and practical testing of certain theoretical situations throughout the game (I3). Common skills mentioned teamwork, practical theoretic knowledge application.

1. b) How are they assessed after playing the game? If not, why?

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One of three interviewees do not assess playing results. Interviewee (I1) do not provide clear answer ("Because <...>it is quite different"). Other 2 interviewees assess students after games in different methods:

- Giving time and other criteria teams reach their final place. Then team has to analyse all their own decisions, make it like a report, and it is presented to the audience. Evaluation is just more complex and wider context than final position after game (I2)
- Giving some criteria and assessing originality, critical thinking ability, the ability to gather certain material and select to adapt what you need. Trying to introduce some criteria for creativity (I3)

2. Which teaching skills/competences are gained by the tutors through the use of games in a teaching process?

During the using the games in a teaching process teacher also acquire similar competencies as students, with specific reference to adaptation and creativity (I1, I3). Creativity (I1, I3) and lifelong learning (I2) emphasized as the most important competencies. Creativity: how to gamify some situations and process in the lecture form. As students change you teachers are forced to choose new didactic methods. Generations are changing and must meet their needs, their expectations. This is continuous improvement and lifelong learning (I2) Other skills/competences mentioned: planning, organizing (I1), well mastered IT at the same as students' level, look at the theory at different angle (I2), collaboration with students, moderation (leadership of the situation), playfulness, involvement, approaching the audience (calling it empathy) (I3)

3. What is the significance of game-based learning over other pedagogical approaches?

All interviewees emphasize the effect of students' self-involvement of the games. Even learner is more interested in lecture with games (I1). GBL is important due to involvement, interactivity (I3), testing in practice. Students in GBL could touch in practice such things and gain a lot of those benefits (I2). Games are helpful in gaining

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knowledge, conveying that knowledge. GBL makes greater collaboration with your audience (I3). On the other hand, you can't base everything on the game alone, the game must be based on some knowledge in the teaching process. And the game can get bored. Young people can play too much. (I3) The interviewer (I2) highlights that is a fun way to develop soft skills through the promotion of socialization and integration.

4. a) What are the challenges you face in your game-based teaching?

b) How did you solve it?

The main challenges in interviewees' game-based teaching are related to organizational work, especially time management. Limited time is a challenge (I2) because it takes a lot of time (I1). Content challenge is the issue too. Learner needs to figure out how to reveal his topics, how to create all those situations for so-called simulations. (I3). The challenge is to include everyone (i.e., all students) that would like to participate, because here is not an exam, you will not check for scores for their involvement. (I3) GBL becomes more complicated in big groups, as learner has to adapt and divide a hundred people into many small groups for simulation. (I2). Financial resources are the challenge too, if you need to get a permit, license, or any other methodology, it costs money and faculty may not always find the funds they need. (I2) Nowadays distance learning and games has many additional technical, organizational challenges (I2)

1. b) How did you solve it?

All interviewees are concentrated more on challenges than solutions. A few mentions are made about solutions:

- Time and content creation challenge solves involving social partners (municipality) or university practical cases. In this way practical situations comes together with partners; learner gets help from partners. (I3)
- Financial resources challenge. Learner is looking for free versions of simulations, involving students' feedback for administration decision of buying simulations.

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- Time challenge decision is mainly based on learner higher number of hours for preparation, mainly free of charge. Sometimes the lack of academic hours for students are compensated by voluntary decision to stay after lecture (I2)

4. Are there any measures you take to ensure inclusivity of different players in your game(s)?

All interviewees did not have complicated issues regarding inclusivity of different players. The main problems, regarding inclusivity, were the cultural differences of foreign students (I1), emotional sentiment working alone (I3), lack of students' experience working in team (I1). By using creativity and flexibility teacher find fluent solution of inclusivity: leaving working alone, giving additional role in the game, using playful situations as characteristic of human to play.

9. *What other areas of teaching you might suggest for your game(s)?*

The interviewees games suggestions for other areas are common and abstract like any specialty (I1), wide variety of sciences (I2) or all areas where problem-solving is available. The using game can be applied by anyone who is learning some economics. Although the basics. (I2). The learner used economic simulation for engineering economics module for engineers and the results, feedback was very positive.

7. What were the costs of developing/playing the game (financial/time-based / human-based costs)?

The common declared cost of all interviewees is time. GBL takes time for preparation, reflection, then for the whole realization of how something must happen. Human resources are yourself, learner is like that human resource (I1) Lecturer gives example, that he can create five situations in about the same amount of time as he prepares for one lecture, but, finally, it is difficult to compare and evaluate. (I3) The tendency shows that the game requires more creative resources. Maybe it takes a little more time if it were always games alone instead of traditional training. (I3)

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One interviewer (I2) emphasizes financial resource as university buys license for using simulation. But it's limited amount of money that faculty can't afford it right now. Despite license and provided simulation, lecturer need to go back and keep updating because the information is very variable. And the cost of time is huge. Here it is necessary to review every year what has changed, to update the data, because the data may already be newer, maybe something is becoming obsolete.

8. What alterations your game might need in the face of the new pandemic and general interest towards online teaching?

Although interviewees provide different opinions to GBL based on distance learning, there are common sense that contact learning is preferred. Two interviewees (I2; I3) adapt most games to the online environment and use webcams, Zoom rooms, different platforms, and online collaborative tools. One interviewer (I1) didn't adopt existing simulation for distance learning as there is too much work. Distance learning based on GBL is more difficult; much less time would be spent on technical things (I2). The risk exist as the technical hurdles can be the internet connection, the very loud noise at home. Other alterations mentioned: longer lecture duration, working separately, a bit changed (adopted) content.

ULU, Portugal

1. a) What students/audience's skills or behaviours are aimed?

Depending on the applied pedagogical strategy, competencies are also singled out. It should be noted that the interviewees are both those who create games (and teach students to create them) and those who do not but apply them in pedagogical activities. Thus, both game-based learning and game-based learning are considered valuable pedagogical practices (I3: "We do not work with game-based learning in a traditional sense, but with game creation-based learning").

The traditional approach is to pursue different competencies and they may vary depending on the type of game. Interviewees who use board games distinguish between cooperation, communication,

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creativity, planning, and decision making. I2 emphasizes that "strategic dimensions, creative interactions and narratives also play important roles". (I1: "The strategic dimensions, creative interactions, and narratives also have important roles"). "Social interaction" is defined as "the most valuable feature of board games" (I1: "We know that social interaction is the most valuable trait of a board game").

Role-type promises aim to develop communication, negotiation, cooperation and decision-making skills, communication, negotiation, cooperation, decision-making (I2). When interviewers teach to create games (I3) for people with specific needs, they aim to "foster their inclusion-driven knowledge, namely, how to develop for accessibility. This includes the acquisition of skills related to several different frameworks, such as universal design or human-computer interaction" and to "foster cooperation, problem-solving, and several skills that students will need to be better integrated in the games industry as professionals", also "intend to promote citizenship" (I3).

To conclude, the implemented pedagogical strategies are aimed at fostering such skills as accessibility, creativity, problem-solving, cooperation, citizenship, communication, negotiation, decision-making, planning and aims to promote social interaction.

1. b) How are they assessed after playing the game? If not, why?

The assessment is performed using different methods:

1. Questionnaires, surveys (I1; I3). They can be used for both participants and organizations to assess both the course of the game and the attitude.
2. Observation (I2; I3), by which the filming can be used to observe the behaviours systematically.
3. Interviews with mentors and teachers (I2)
4. If the pedagogical practice is focused on the development of games, then the prepared projects are analysed, assessing their creativity and accessibility (I3).
5. Thus, assessment takes place in several directions: both in terms of impact on students and organizational questions as well as the specific requirements of created content.

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2. Which teaching skills/competences are gained by the tutors through the use of games in a teaching process?

During the using the games in a teaching process teacher also acquire the same competencies as students, with specific reference to adaptation and creativity (I2, I3). They are more "flexible, recognises the positive role of games, become more familiarized with game concepts and vocabulary, creates closer relationships with students, observes how students/participants interact in a more relaxed setting and can assess their behaviour" (I2).

Attention is also drawn to the process of games: there must be simple and clear requirements before starting the play and teachers "must be able to evaluate the game-based learning process. The debriefing of the game with the students is essential."(I1). Game-based teaching requires the teacher to be properly prepared which means the teacher improves their planning skills.

Also, the creation of an engaging game which allows to achieve learning goals in a fun way "demands expert knowledge" and there is an even greater challenge (I1).

3. What is the significance of game-based learning over other pedagogical approaches?

It is emphasized that the main advantage over other pedagogical methods is that they are "incredibly powerful" (I1) when it comes to student engagement ("It is easy to promote the engagement of participants in activities with games <…> I2) and is "more project-based and experiential, which fosters learning with a meaning, instead of more passive and less participatory approaches (I3). As well the experience gained during the games stimulates "social and emotional processes", "they also strengthen our ability to manage emotions, delay instant gratification and reinforce our determination, perseverance and self-discipline" (I2). I2 highlights that is a fun way to develop soft skills through the promotion of socialization and integration.

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4. a) What are the challenges you face in your game-based teaching?

As few of the main challenges are identified the attitude to games as an inappropriate tool to achieve learning goals and of what games are and the perception to whom they are intended. "There is prejudice about game usage, especially with adults. People think games are childish activities without productive results" (I1), "The biggest challenge is related to the cultural vision of what a game is and what it is for, being often seen merely as a recreational activity that cannot teach anything (I2).

When games are created by students, then teachers face different challenge – the students' attitudes are short - term, oriented to final evaluation and it is hard to engage them for longer period. Challenges "are related to the need for engaging students sometimes for a bigger period than the school year, which is very complicated. Students think in a very traditional way, associated with more passive learning models, that value only the "final grade"."(I3)

4. b) How did you solve it?

To highlight the benefits of using games in teaching, the game process itself by one of the interviewees is not referred to as a game. ("Sometimes I do not call the game activities games, I just call them interactive dynamics, processes, or another related word").

In order to change the attitude, teachers tend to introduce scientific knowledge about serious games before starting game activities, tries to "show participant's feedback or propose a demo session (preferably with decision makers observing or participating in the session, to experience the participants' enthusiasm)" (I2) too. Thus, the demonstrated experience of the participants allows to convince the effectiveness of the use of games in teaching.

5. *Are there any measures you take to ensure inclusivity of different players in your game(s)?*

Not all interviewers have a need to ensure inclusivity in their game ("It may be a concern, but so far, I didn't feel the need to take

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additional measures in any activity" (I2), by those who pays attention, do this through cognition of the future audience ("I try to already know who will play the games"(I1), adaptation of games for that audience ("I adapt the complexity of the games and the themes to be more inclusive"(I1). This adaptation may include different game components such as "the size, colours, and tactile feeling" (I1) and assessment of the complexity of) the games.

Other interviewers believe in games as a tool to promote inclusion or treats games as inclusivity measures: "I believe games are a great way to promote inclusion, in the sense that, in a game, all players start from the same place, have the same goals and the rules apply to everyone. Therefore, they help to eliminate differences (age, gender, hierarchical, social) and help make conversations easier" (I2); "the games are our inclusivity measures (I3)". When the games are created for people with specific needs, such as deaf people or people with Intellectual Disability, the main point is to develop the inclusive game.

6. *What other areas of teaching you might suggest for your game(s)?*

Regardless of whether the interviewees themselves creates the games or uses created games in teaching process, they think that they can be applied in other areas too:" I believe that analogue games can be applied to any areas and to teach anything. I have been cases where games were used to teach geography, history, mathematics, chemistry, and many other disciplines. I have seen serious games for gender equality, racism, and many other contemporary relevant issues" (I1), "These model of community engagement and inclusion promotion through game creation can be used in several different areas" (I3).

The interviewer (I2) who does not create games, emphasizes that the variety of board games on the market allows to choose games according to different criteria (game type, theme, complexity, duration, number of players, recommended age) and to choose the right one for specific context.

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7. What were the costs of developing/playing the game (financial/time-based / human-based costs)?

The costs incurred depend on the attitude, aims, the type of game, it's methodology and complexity ("With the appropriate methodology, we can do a serious game with some game components and with just some simple prints. But developing complex and very detailed games can be expensive and time-consuming" (I1)).

One of the interviewees specifies costs of board games – "around 20 - 40€ per game" or free role plays games as they are provided by project promoter. In terms of time and human costs, they vary depending on the type of game and number of participants but also includes the time for preparation which is also varies. When it comes to game development, it is described as an extremely costly activity: "Making games is very demanding. They demand many resources and people working full-time." (I1).

8. What alterations your game might need in the face of the new pandemic and general interest towards online teaching?

Although contact learning is preferred, interviewees adapt most games to the online environment and uses multiples webcams, different platforms, and online collaborative tools (Discord, Roll20 and Watch2gether, Zoom, Boardgame arena, Tabletopia) and trying to maintain student interaction. ("In order to maintain the social contact that board games foster, synchronous sessions were planned, using Zoom (with webcam and microphone) for students to interact" (I3)). But when it comes to inclusion, it is termed as a disadvantage of game development learning because developers cannot directly ask the interests and needs of the target audience in an online environment.

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3. Brief introduction of each existing practice written and visually documented case studies

Total 9 showcases were provided by 4 partner countries: 2 per Lithuania, Greece and United Kingdom and 3 from Portugal. The main type of games used in higher education were table games (e.g., Chinatown, Internota, City Planning Game - Sustainable resource distribution). Also, lecturers applied few card games (e.g., Coup, Hanabi), simulations (e. g. ECOSIM Maynard, experimental simulations e.g., Prospect Theory and Public Goods Game) and as well as the method of Lego Serious Play.

The games goals concentrate on both specific academic topics (e.g., the subject of economics focuses on sales, provisioning processes, loss effects, endowment; concrete problem solving like city planning and sustainability) and social skills (see table 9 section "topics covered").

The main goals indicated in the showcases
• To acquaint participants with the essential sales, negotiation processes, supply and demand laws, and the implementation of goals through negotiation • To promote cross-sectoral cooperation, communication, to develop entrepreneurship's skills based on self-awareness and recent needs of economy. • To foster communication and to enhance the dynamics of a team in solving the problems of the group and / or the people involved. • To release imagination, inspiration, and intuition as it involves human aspects such as emotion, logic and instinct. • To build a city in a way that the distribution of the resources (food, water, other goods and nature/green spaces) are distributed sustainably throughout the city's territory

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- To teach students to work in teams to design and run lab-based experiments
- To promote negotiation and other related social skills (e. g. behaviour interpretation).
- To foster management skills, most specifically area control, and basic arithmetic.
- To promote basic management and negotiation skills, as well as interpersonal relationship skills, associated with body language interpretation (bluffing, lying)
- To promote cooperation between players, through the need to adopt collaborative strategies and alternative communication
- To learn how a behavioral economic theory of their choice can be understood and investigated
- To understand how people effected by loss, and endowment

Topics covered

- Investment
- Economics
- Risk management
- Negotiation
- Sustainability
- Ethical leadership
- Moral imagination
- Personal awareness
- Team building
- Problem's solutions
- Strategy development
- Shared mindset
- Effective and constructive discussions
- Creative thinking

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- Sustainable city planning
- Urbanism
- Personal awareness
- Critical thinking
- Behavioural Economics
- Economics
- Business and Entrepreneurship: risk management, financial planning
- Math: addition, subtraction, and multiplication.
- Social Skills: negotiation, communication, persuasion, understanding of body language.
- Strategy and Critical Thinking
- Strategic Thinking
- Memory and Deduction
- Communication
- Strategy
- Memory
- Deduction
- Relevant economic theory (depends on what topic are picked)
- Teamwork / group work
- Experimental design methods
- Data collection and analysis
- Prospect theory
- Loss aversion
- Endowment Effect
- Risk preferences (Risk Loving, Risk aversion, Risk neutrality)
- Expected Utility Theory

Advantages:

- High student engagement (4 different stages of simulation)

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- Can be applied to different number of students
- Number of stages can be flexible (from 2 to 4)
- Can be applied not only in the economics field
- Flexible duration according to number of stages (from 1,5 hours to 4 hours)
- 1 lector could manage from 1 to 3 simulations simultaneously, comparing their results
- Option to evaluate participation and results
- Safe and engaging interaction
- Short time (60 – 90 min.)
- Easy apply to any audience
- Easy to collect bright variety of opinions
- Easy apply different interactive drama techniques: discussion, role playing, theatre of Oppressed by A. Boal
- Creating leaning in unlocking new knowledge and breaking habitual thinking
- Safe and engaging interaction
- Decision-making
- Consciousness for urban sustainability
- Collaborative work
- Communication and negotiation
- Creative thinking
- Working out the best solution to a shared problem
- Short time (45 min.)
- Applicable to any audience
- Real-world relevance
- Social interaction
- Strategic thinking
- Flexibility
- Multiplayer

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- Quick and Easy to Learn
- Strategic Thinking
- Memory and Deduction Skills
- Fun and Engaging
- Cooperative gameplay
- Strategy and deduction
- Creative thinking
- Social skills
- Gives students a large amount of agency and freedom to think and discuss
- Provides sufficient structure when requested
- Replicates a supervisor relationship preparing students both for further study if they wish or work
- A more holistic way of linking about economics pinking theory and data in a very really and tangible way
- A fun way to learn new theories and ideas
- Short
- Easy to apply to any audience with the expectation that you can explain the instructions to anyone, and subjects can be of any level
- Easy to replicate and rich set of existing comparison studies

Table 9. The main aspects of game showcases in higher education

Almost in all showcases are mentioned communication, cooperation, team work, negotiation. The part of the cases focuses on human aspects such as imagination, inspiration, intuition, logic and interpretation of behavior e.g., bluffing and lying. This shows a wide range of uses for games in higher education.

Also, it can be concluded that most of the advantages mentioned in the showcases are adaptability, flexibility (both time of the game and

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number of students), applicability to different audiences. The shortness of game time is one of the elements of attraction for academics as well as easiness to collect data and different opinions. Thus, the benefits of the game are not only associated with students but also with academics.

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4. Conclusions

Even though all articles state the undoubted benefits of GBL, analysis of the articles revealed many a significant shortcoming in the study area:

- The lack of a strategic overall picture of how GBL may appear in the overall context of syllabus or the curriculum in general.
- Lack of common understanding of games importance in a learning process.
- Definitions 'explanation is needed because some authors refer serious games to online games only.
- Lack of empirical articles in a GBL field.
- A minority of authors present the teaching paradigm.
- The knowledge and methodology are needed on how to design and apply games in a learning process.
- Students' evaluation strategy. How to evaluate the students after using the game? How to measure students' progress in a particular topic? How to evaluate the inclusivity of plyers?
- The teachers 'competencies required has not been discussed in the articles read - there is a bold field for research, methodology and training.
- Large heterogeneity between studies, not only on the field of studies, but also in the adopted methodology and, mainly, the data reported by authors also shows the lack of academic discussion in this topic.

Twelve interviews were conducted and summarised. The experience of the informants in the GBL field let us generalize, follow trends and delve into the chosen area.

Although we planned to focus on business and language studies at the beginning of the project, the literature analysis and all 12 interviewees confirmed that GBL can cover extremely wide range of studies.

Why GBL?

- GBL provides an outcome-based learning experience [LSBU(I1) "GBL provides an outcome-based learning experience to students which cannot be done without games. Games and

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simulations put people in action to utilize their knowledge acquired in lectures or self-reading or learning from others."]

- GBL creates realistic scenarios during the pandemic [LSBU (I2) "GBL creates realistic scenarios and environments that may not be possible in real life, especially during the pandemic"]
- GBL can connect abstract and concrete aspects of learning [LSBU (I2) "GBL provides opportunity for learning contents and activities to be represented in a more engaging way, allowing the connection between abstract and concrete representations of topics to make it easier for someone to go through certain scenarios"]
- GBL is an efective way of teaching [HOU (I2) "The game seems to be a more effective way of learning and getting acquainted with the environment of a company as opposed to other ways". However, (HOU I1) "GBL are always applied as an adjunct, not as the basic means of education"
- The GBL cannot substitute other pedagogical approaches [LSBU (I3) "The GBL cannot substitute other pedagogical approaches. The idea that GBL is all fun and lectures are boring is incorrect. A fusion between these two would be the ideal way for teaching."]

GBL: the list of competencies

Regarding the opinion of interviewees, GBL can develop a wide variety of student competencies. The list of skills and competencies mentioned is presented in the alphabetical order below.

1.	**Accessibility**
2.	Adaptation to changes
3.	Analytical thinking
4.	Citizenship
5.	Collaboration/cooperation
6.	Communication
7.	Creativity

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8.	Cultivation of enthusiasm for achieving goals
9.	Cultural awareness
10.	Dealing with complexity and ambiguity,
11.	Decision making
12.	Development of process simulation skills
13.	Empathy
14.	Finding innovative solutions
15.	Leadership skills
16.	Listening <…> market needs
17.	Negotiation
18.	Planning
19.	Problem solving (conflict resolution)
20.	Relationship management
21.	Self-efficacy
22.	Social interaction.
23.	Strategical thinking
24.	Teamwork
25.	Theoretical knowledge and practical testing

Table 10. The list of skills and competencies

The chart below shows how often specific skills and competencies were mentioned.

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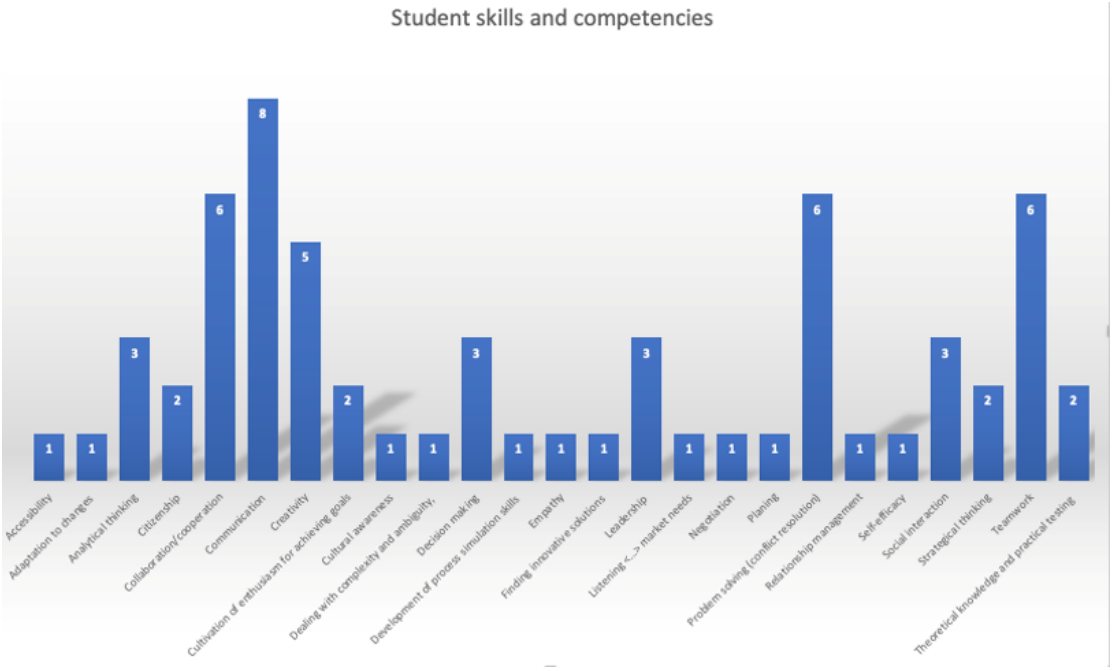

Figure 1. Specific skills and competencies of students

Assessment: Pro and contra

The formal criteria, some particular form of assessment (i.e., grades) was not specified by interviewees. The students' assessment performed using different alternative methods:

1. Questionnaires, surveys (ULU I1; I3). They can be used for both participants and organizations to assess both the course of the game and the attitude.
2. Observation (ULU I2; I3), by which the filming can be used to observe the behaviours systematically.
3. Interviews with mentors and teachers (ULU I2)
4. Giving some criteria and assessing originality, critical thinking ability, the ability to gather certain material and select to adapt what you need. Trying to introduce some criteria for creativity (VU I3)
5. Informal assessment through discussion with the students, sometimes "as a focus group after the gameplay" (HOU I2).

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6. Evaluates the behaviour of the participants during the game and collects feedback from participants after the end of the game. (HOU I1)
7. "Peer to peer assessment "by the students as to whether the game achieved its goals" and submits „teachers' views regarding the educational experience. (HOU I2)

Several opinions were given why the GBL assessment should not be formalized.

- Dark side of negative competition. [LSBUI1) "it also induces dark side behaviours of negative competition among students too, and in those cases, it only becomes about winning, forcing them to look into loopholes in the rule of games"]
- Knowledge must come regardless of the outcome of the game. (HOU I3)
- The learner should want to participate, not because the teacher asks them to do it. Knowledge should not be associated with winning or losing in the game. Knowledge must come regardless of the outcome of the game. Learning should come through **fun by playing a game**. The game should have mechanisms to make sure that the "loser" will not be discouraged. (HOU I3)

The definition of the game, which was defined for our project, in general correlates with the understanding of the game of interviewees, i.e., the element of fun must occur be regardless all educational intentions (**"**Learning should come through fun by playing a game." (HOU I2, HOU I3)

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References

1. Caillois, R. (1962). Man, Play, and Games. Thames and Hudson, London.

2. Frasca, G. (2007). Play the message: Play, game and videogame rhetoric. Thesis presented to the IT University of Copenhagen to obtain a PhD degree, supervised by Espen Aarseth, Copenhaga. Accessed in November 2020, in https://www.yumpu.com/en/document/read/11225449/frasca-play-the-message-phd.

3. Huizinga, J. (1955, originally published in 1938). Homo Ludens: A Study of the Play Element in Culture. Beacon Press, Boston.

4. Juul, J. (2003). The Game, the Player, the World: Looking for a Heart of Gameness. Proceedings of evel

5. Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. International Entrepreneurship and Management Journal, 16(3), 1023-1042.

6. Salen, K. & Zimmerman, E. (2003). Rules of Play: Game Design Fundamentals. Cambridge, Massachusetts: The MIT Press.

7. *Up:Digital Games Research Conference Proceedings, 30-45.* https://www.jesperjuul.net/text/gameplayerworld/

8. Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. Journal of Planning Education and Research, 39(1), 93-112.

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ANNEX 1. The questionnaire

Consent for participation in a research interview for TEGA project funded by Erasmus Plus

I agree to participate in a research project conducted as part of TEGA project.

I have received sufficient information about this research project and understand my role in it. The purpose of my participation as an interviewee in this project and the future processing of my personal data has been explained to me and are clear.

My participation as an interviewee in this project is completely voluntary. There is no explicit or implicit coercion whatsoever to participate.

GBL expert is a person, who creates the game and is familiar with its application into classroom.

Game creator is a person who creates the games, but not necessarily cares about the specific of GBL implementation.

Participation involves being interviewed by (a) researcher(s). The interview will last approximately 63 minutes. I allow the researcher(s) to take notes during the interview. I also may allow the recording of the interview and subsequent dialogue by audio/video tape. It is clear to me that in case I do not want the interview and dialogue to be taped I am fully entitled to withdraw from participation.

I have the right not to answer questions. If I feel uncomfortable in any way during the interview session, I have the right to withdraw from the interview and ask that the data collected prior to the withdrawal will be deleted.

I have been given the explicit guarantee that the researcher will not identify me by name or function in any reports using information obtained from this interview, that my confidentiality as a participant in this study remains secure. Personal data will be processed in full compliance with GDPR Data Protection Policy.

I have carefully read and fully understood the points and statements of this form. All my questions were answered to my satisfaction, and I voluntarily agree to participate in this study.

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Question number	Duration in minute	Task	Responses
	9	Respondent Background	
1	1	Welcome and thank you for participation	
2	1	Have you agreed to the consent form above and previously provided to you?	
3	1	What is your Role (Teacher, GBL experts, Game creator?)	Teacher ☐ GBL expert ☐ Game creator ☐
4	1	Age group of the interviewee (20-30, 30-40, 40-50, above 50)	20-30 ☐ 30-40 ☐ 40-50 ☐ Above 50 ☐
5	1	Your Gender (Male, Female, Other, prefer not to disclose)	Male ☐ Female ☐ Other ☐ Decline to answer ☐
6	1	Years in practicing game-based learning	
7	1	Type of the game you are using/creating	Board Game ☐

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			Puzzle ☐ Card Game ☐ Role Play ☐ Others ☐
8	1	Field of expertise of the interviewee	
9	1	Field of the study(ies) of target audience	
	58	Open questions	
1	5	What students/audience's skills or behaviors are aimed and how are they assessed after playing the game? If not, why?	
2	3	Which teaching skills/competences are gained by the tutors through the use of games in a teaching process?	
3	3	What is the significance of game-based learning over other pedagogical approaches?	
4	3	What are the most used game types, game mechanics, and techniques in your practice?	
5	5	How game-based learning appeared in your professional life?	
6	5	What are the challenges you face in your game-based teaching? How did you solve it?	
7	2	Are there any measures you take to ensure inclusivity of different players in your game(s)?	
8	2	Are there any measures you take to ensure sustainability of your game(s)?	
9	2	Is there any particular framework you used to develop your game(s)?	
10	2	What other areas of teaching you might suggest for your game(s)?	

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11	5	What were the costs of developing/playing the game (financial/time-based / human-based costs)	
12	5	What alterations your game might need in the face of the new pandemic and general interest towards online teaching?	
13	10	Any other points you would like to discuss	
	2	Closing	
1	1	Thanks for participating	
2	1	Any question you may have?	
Total Time	54, f. ex.		
Observa-tion from intervie w			

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ANNEX 2. The showcases

Lithuania (VU)

Simulation game – "ECOSIM Maynard"

Goal:

To acquaint participants with the essential sales, negotiation processes, supply and demand laws, and the implementation of goals through negotiation.

Description:

It is a simulation game played in auditoriums and simulated in the real estate market. During the simulation, groups of participants represent companies that need to achieve individual investment goals. In order to achieve the goals, the groups of participants must apply negotiation, strategic planning, sales and teamwork skills in an integrated way. The simulation takes place in a limited investment environment, where conditions change and various conflicts of interest are recorded, thus making it significantly more difficult for all groups of participants to achieve the objectives.

The most important task of each team is to accumulate the necessary tangible assets (some land or money) to implement their investment projects. There is no single winner in the game, as in business. Each company can become a winner for itself by achieving its goals depending on the prevailing market situation during the simulated game.

Topics covered:

- Investment
- Economics
- Risk management
- Negotiation

For the successful game, we need:

- Number of players: From 8 to 24 people.
- There are 4 teams (companies) in one game, so there can be 2-3 people in a team, 8-12 participants in one game. With more

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participants, it is recommended to play 2 games in parallel, increasing the number of participants to 24.

Number of facilitators and measures needed:

- At least 1 for 4 teams.
- The game takes place in the auditorium using paper symbols of certain game objects (money, plots of land, etc.). When playing with larger teams, it is recommended to conduct training with two or more games, involving additional lecturers / facilitators as needed.

Skills and knowledge developed:

- Negotiation and sales skills, teamwork, conflict management, strategic planning, goal setting, market formation.

Customization options:

- Can be used as a team building game, as well as for strategic planning and negotiation, sales skills training / sessions.

Advantages:

- high student engagement (4 different stages of simulation)
- can be applied to different number of students
- number of stages can be flexible (from 2 to 4)
- can be applied not only in the economics field
- flexible duration according to number of stages (from 1,5 hours to 4 hours)
- 1 lector could manage from 1 to 3 simulations simultaneously, comparing their results
- Option to evaluate participation and results

Simulation is based on practical evaluation and development in marketing lectures, trainings in business, management fields. 2 students in the field of economics have developed full simulation game from simple practical example in the marketing lecture. The stages from 1 to 4 were developed in practical application in trainings, based on lecture experience and insights.

Board game INTERNOTA

Playing on Sustainability: from words towards performance

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Goal:

To promote cross-sectoral cooperation, communication, to develop entrepreneurship's skills based on self-awareness and recent needs of economy.

Description:

Innovative board game INTERNOTA is an educational, or to be more exact, edutainment tool for adults educated participants. Participants of this workshop are invited in an attractive, playful form debate sustainability, which is one of the wicked problems (Rittel, H., Webber, M., 1973) of our society, and search for creative solutions.

INTERNOTA game is an experience-based form of participatory training, which allows insights into both, the universal and the everyday processes, and reflects on impact of our daily behaviour.

The discussions` methodology is focused on essential human needs` understanding (Rosenberg, M. B., 2003) and reflecting how dangerous of all behaviours can consist of doing things „because we`re supposed to." (Rosenberg, M.B., 2003, p. 140).

Neeland claims that „The form of drama allows them to resolve situations through action<...> and discover their consequences. (1992, p. 66). He also describes specific drama techniques, which mixed with Johnstone, K. Impro theatre strategy (1999) makes social drama workshop more fun and dramatic.

Publishing of the board game INTERNOTA has been partly funded by Lithuanian Council

Inspiration:

The concept of this board game is designed on the basis of the research, which took place in 3 countries: Lithuania, UK and Brazil.

Topics covered:

- Sustainability
- Ethical leadership
- Moral imagination
- Personal awareness

For the successful game, we need:

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- 4-16 players
- 1 facilitator
- One desk and chairs for each participant

Workshop`s advantage:

Safe and engaging interaction

- Short time (60 – 90 min.)
- easy apply to any audience
- easy to collect bright variety of opinions
- easy apply different interactive drama techniques:
  - Discussion (D)
  - Role Playing (RP)
  - Theatre of Oppressed by A. Boal (TO)

Greece (HOU)

Lego Serious Play

The LSP method is based on:

- A set of relatively simple rules
- The use of LEGO (bricks) and
- The existence of a group

Goal:

- It is a technique that fosters communication and enhances the dynamics of a team in solving the problems of the group and / or the people involved.
- It releases imagination, inspiration, and intuition as it involves human aspects such as emotion, logic and instinct
- It does not transfer knowledge. As children during their playing create models based on their experience of the world and the perception they have of it, it tries to do the same to adults on specific topics
- It encourages the acquisition of knowledge by doing something and not just talking about it.

People express themselves better by doing something outside of them or their world e.g., by making a model, a castle in the sand, a machine, etc.

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Research has shown that making something with our hands help us to describe things better than if we tried to describe it in words only.

Description:

Set the question (challenge)

The facilitator makes clear the building time and asks participants to build a model with their LEGO® bricks that expresses their thoughts on the building challenge, or response to it.

Construction (build the model)

Participants think with their hands and build their response to challenge with LEGO bricks. It is a concrete, three-dimensional models of their reflections and ideas.

While building their models, participants assign meaning and narrative to their models by means of metaphors, figures of speech, and narratives.

Sharing (the message)

One at a time, each participant shares the significance and story that they have assigned to their own model. The sharing is in itself a reflection process: participants explore their own expressions more closely.

Reflection

Ensures that every participant in a workshop is and remains involved in realizing a solution. Nobody is left out while all knowledge is visible on the table.

Inspiration:

To help tackle the problem of socio-occupational exclusion of disadvantaged adults aligning itself with the actions implemented by EU member states.

Topics covered:

- Team building, where a group of people work together (but do not necessarily know each other very well)
- Working out the best solution to a shared problem

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- Strategy development, where all relevant individuals get the opportunity to contribute their vision of the aims and challenges, and consolidate these with the ideas of others
- Creating a shared mindset about something
- Understanding each other's points of view on a deeper level
- Having effective and constructive discussions where everybody is heard
- Unleashing creative think

For the successful game we need:

- 2-12 players
- 1 facilitator
- Specially designed or childhood Lego bricks

Workshop`s advantage

- Creating leaning in unlocking new knowledge and breaking habitual thinking

Board game: City Planning Game - Sustainable resource distribution

Goal:

To build a city in a way that the distribution of the resources (food, water, other goods and nature/green spaces) are distributed sustainably throughout the city's territory.

Description:

The players work as a team. Their goal is to place the territory units (hexagons) on the table to create the territory of the city. The players are free to decide the plan and the shape of the territory. Then they place the building blocks of the city (white cubes) on the hexagons (urban hexagons).

They must decide on which hexagons they should place the tiles of the resources (Green=nature / Blue=water /Yellow=food / Black=other goods). Finally, they use the colored connection sticks to establish the necessary connections between the urban hexagons and the resources.

Each hexagon can host only one type of tile or just white cubes (maximum of 6 of the same, except the green ones). Empty urban hexagons also get points of success.

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The ultimate goal is to place the buildings and the resources in such a strategic way so that all building blocks (urban hexagons) have access to natural environment (green), water (blue), food (yellow), goods (black). If this success condition is fulfilled, then the corresponding success cubes (green, yellow, blue, black) are placed on top of each block of white cubes (i.e., buildings) (See image below).

Each building block gets access to the 4 aforementioned types of resources if its urban hexagon has a total of adjacent resource hexagons and connection sticks of each color equal to its density (i.e., the number of its white cubes). Having one green space is enough for getting a green success cube.

The scoring is as follows:

- One point for each urban hexagon with all four success cubes
- One point per empty hexagon

Inspiration:

The concept of this board game is based on the need for sustainable design of modern cities.

Topics covered:

- Sustainable city planning
- Urbanism
- Personal awareness

For the successful game we need:

- 4-8 players

One round table and chairs for each participant

Workshop's advantages:

- Safe and engaging interaction
- Decision-making
- Consciousness for urban sustainability
- Collaborative work
- Communication and negotiation
- Creatively thinking
- Working out the best solution to a shared problem

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- Short time (45 min.)
- Applicable to any audience

Acknowledgement:

This prototype game is designed by the game designer Micael Sousa, Researcher in spatial planning at University of Coimbra/CITTA, Department of Civil Engineering.

United Kingdom (LSBU)

Public Goods Game – group decision making game with tokens

Goal:

The goal on the processes is for students to learn how a behavioral economic theory of their choice can be understood and investigated. They will do this by designing and running their own experiment based around this behavioural economic theory and they analysis this in a relevant statistical tool.

Description:

Over the course of roughly 4 weeks (minimum 2) students will design an experiment that can be run in roughly 60 minutes. They design this knowing that at the end of the process they will run it for the other people in their class. This will go through multiple steps

1. They must pick a topic either from a list or independent research.
2. They must research this topic with a focus on the theory being proposed ideally in the form of a model using game theory or deicsion theory.
3. They then need to consider what questions in this area they would like to investigate and build a proposal (end of week 2 or week 1 if being done in a short time)
4. With these two concepts (the theory & what they want to investigate) they must create an experiment that can test this concept. Specifically, one that can generate sufficient data to run future analysis and be run in class.
5. Having designed the experiment, they need to produce the following resources: Plan of procedure, instructions to participants, and an answer booklet (end or week 4 or week 1 if being done in a short time)

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6. They then run the experiment over the course of 1 hour collecting data in excel.
7. After the experiment they will take the data and create a data set to use in STATA or similar program. This data is then analyzed to try to understand the concepts they wanted to investigate.
8. They should then write a reflection and after this write a longer experimental essay. (Assessment methods can vary)

Inspiration:

The inspiration for this assessment method to be in the form of an experimental game design comes from a believe that there is a lack of practical application in Economics that is not case study based. There is limited scope for data generation that is not inherently just searching data bases. As such this is a chance for people to learn how to design an experiment and generate their own data in a very controlled environment with sufficient support.

Topics covered:

- Relevant economic theory (depends on what topic they pick)
- Teamwork / group work
- Experimental design methods
- Data collection and analysis

For the successful game we need:

Groups to design the experiment can be anything from 1 to 5 but 2 to 3 is preferable. They will need access to all Microsoft functions as well as eventually STATA or similar statistics software.

Workshop`s advantage:

- Gives students a large amount of agency and freedom to think and discuss
- Provides sufficient structure when requested.
- As such replicates a supervisor relationship preparing students both for further study if they wish or work.
- Creates a more holistic way of linking about economics pinking theory and data in a very really and tangible way.
- Hopefully a fun way to learn new theories and ideas

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Prospect Theory Game – betting with sweets to observe loss aversion / endowment effect

Context

There are in effect two layers when it comes to the goals of the game. For this reason, I have filled in two documents. The first explains the 'game' that is the design of the experiments. Or possibly more accurately the process of design where students learn how to think about economics as a type of game and how they can both design a game and test behaviour using it. The second is then the aim of the specific experiment (here prospect theory and in the other public goods) and what they can teach the players and what is learnt by the participants. This is the second of these for the prospect theory.

Goal:

To understand how people effected by loss, and endowment. Do people act differently when outcomes are presented as losses and gains instead of simply payoffs. Do people care more about something when they pick it rather than when they are yet to get it.

Description:

Prospect theory is a general concept that suggests that the pre-existing literature on expected utility proposed by Von Neumann and Morgenstern. It argues that people do not make risk-based decisions from an abstract point but rather consider things from their initial starting point as a future prospect. As such the existing utility functions needs to be framed as being gains and losses from an initial endowment and not just a risk attached to gains as initially considered by vNM.

To test this, students set up a simple game of betting. These bets are against on other player or group of players. Victory is framed either as an all or nothing bet where at the end of the game the person with the highest amount will win everything or as a staggered victory where multiple players win something, or you keep your winnings. This creates different winning conditions and therefore incentives to bet on random outcomes. They can also start with no sweets so all future bets are framed as winning or losing and having a negative amount while the other case has endowment of 5 sweets so should make people more reticent to lose what they have already

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(endowment effect) but also even with a lose they still have something so could be argued to be less of a loss. Not a perfect preference / utility process but open to other alternatives using a similar system.

Inspiration:

This is a common concept in behavioural economics. As such the game fits other similar types of tests and games. It also more broadly has been covered in other studies which consider larger groups with less observations. These range to hypothetical cases to cases with monetary reward.

Topics covered:

- Prospect theory
- Loss aversion
- Endowment Effect
- Risk preferences (Risk Loving, Risk aversion, Risk neutrality)
- Expected Utility Theory

For the successful game we need:

Minimum 2 players for the game to happen. 4 for this example to allow 'small' and 'large' groups to test the group size hypothesis. For the wider experimental design topic 8 – 16. 1 Facilitator however if not computerized 2 – 3 is preferable. Desk per group of 4. Sweets or other type of prize.

Workshop`s advantage:

- Short: Single round can be completed in 5 minutes so allows for repetition to generate a richer data set. Generate data easily.
- Easy to apply to any audience with the expectation that you can explain the instructions to anyone, and subjects can be of any level.
- Easy to replicate and rich set of existing comparison studies.

Portugal (Lusofona)

Board Game CHINATOWN

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https://boardgamegeek.com/boardgame/47/chinatown

Goal:

- To promote negotiation and other related social skills (e. g. behavior interpretation).
- To foster management skills, most specifically area control, and basic arithmetic.

Description:

Chinatown is a board game designed by Karsten Hartwig and first published by Alea in 1999. It is a strategic economic game that simulates real estate development in New York City's Chinatown neighborhood.

The game is played with 2-5 players, each of whom represents a business owner in Chinatown. The goal of the game is to build a profitable business empire by buying, selling, and trading properties, as well as negotiating deals with other players.

At the beginning of the game, each player is given a number of tiles representing different types of businesses and properties. Players take turns placing their tiles on the board to create their own business district, while also attempting to block their opponents from doing the same.

As the game progresses, players negotiate with one another to buy and sell properties, or to swap properties in order to consolidate their holdings. They can also trade cash and other assets or make deals with one another in order to gain an advantage.

The game is won by the player who has accumulated the most wealth at the end of the game, which is typically played over a series of turns or rounds.

Chinatown is known for its simple, elegant gameplay mechanics, which allow for a wide range of strategic possibilities. It is also highly interactive, as players are constantly negotiating with one another and trying to outmaneuver their opponents.

Overall, Chinatown is a challenging and engaging economic game that is popular among board game enthusiasts and strategy gamers.

Inspiration:

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The creator of Chinatown, Karsten Hartwig, was inspired by his experiences living in New York City and observing the vibrant community and culture of Chinatown. He was also interested in economic games, and wanted to create a game that simulated the excitement and complexity of real estate development and business negotiations.

Hartwig was also influenced by other classic economic games, such as Monopoly and Acquire, which share similar themes of property ownership and financial negotiation. However, he wanted to create a game that was more interactive and strategic, with a greater emphasis on player negotiation and deal-making.

Overall, Hartwig's love of New York City's Chinatown, combined with his interest in economic games, led him to create Chinatown, a game that has become a beloved classic among board game enthusiasts.

Topics covered:

- Economics: The game involves buying and selling properties, as well as negotiating deals with other players. This can help players understand basic concepts of economics such as supply and demand, market value, and financial strategy.
- Business and Entrepreneurship: Players take on the role of business owners, trying to build a profitable business empire by buying and selling properties. This can help them develop an understanding of basic business concepts such as risk management, financial planning, and negotiation skills.
- Math: The game involves adding up the value of properties and cash to determine each player's wealth. This can help players practice their basic math skills, such as addition, subtraction, and multiplication.
- Social Skills: The game requires players to interact with one another and negotiate, which can help to develop social skills such as communication, persuasion, and reading body language.
- Strategy and Critical Thinking: Chinatown is a game of strategy, and players must constantly be thinking ahead and planning their next move in order to outmaneuver their opponents. This can help to develop skills such as critical

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thinking, decision-making, and problem-solving, which are valuable in many academic and professional contexts.

For the successful game we need:

- Clear Rules: It's important for all players to have a clear understanding of the game rules before beginning play. This can help prevent misunderstandings or confusion during the game.
- Engaged Players: In order for the game to be successful, all players should be engaged and interested in the gameplay. This can be achieved by encouraging players to ask questions, offer suggestions, and actively participate in negotiations and deal-making.
- Good Communication: Communication is key in Chinatown, as players must negotiate with one another and make deals in order to advance their own interests. Encouraging open communication among players can help to create a more dynamic and engaging gaming experience.
- Fair Play: All players should be encouraged to play the game fairly, without cheating or taking advantage of others. This can help to create a more enjoyable and respectful gaming environment.
- Time Management: Chinatown can be a fairly long game, so it's important to manage time effectively in order to ensure that the game is completed within a reasonable timeframe. Setting a time limit for each round, or establishing a clear endpoint for the game, can help to ensure that the game stays on track.

Overall, a successful gaming session of Chinatown requires clear rules, engaged players, good communication, fair play, and effective time management. By focusing on these elements, players can have a fun and engaging experience while developing valuable skills and knowledge.

Workshop`s advantage:

- Real-world relevance: Chinatown simulates the world of real estate development and business negotiations, making it a relevant and engaging tool for teaching economics, business, and entrepreneurship.

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- Social interaction: Chinatown requires players to interact and negotiate with one another, promoting social skills such as communication, persuasion, and teamwork.
- Strategic thinking: Chinatown is a game of strategy, requiring players to think critically and plan ahead in order to outmaneuver their opponents. This can help to develop skills such as problem-solving, decision-making, and critical thinking.
- Flexibility: Chinatown can be adapted to suit different learning objectives, allowing teachers to tailor the game to their specific needs and goals.
- Multiplayer: Chinatown can be played by multiple players, making it a great option for group work and collaborative learning.

Overall, Chinatown offers a unique and engaging way to teach a variety of skills and subjects, making it a valuable tool for teachers and educators. Its focus on real-world relevance, social interaction, strategic thinking, flexibility, and multiplayer gameplay make it a standout option for classroom use.

Card Game COUP

https://boardgamegeek.com/boardgame/131357/coup

Goal:

To promote basic management and negotiation skills, as well as interpersonal relationship skills, associated with body language interpretation (bluffing, lying).

Description:

Coup is a popular card game that involves bluffing and deception. The game is played with a standard deck of 15 cards, each of which represents a different character with unique abilities.

At the start of the game, each player is dealt two cards face down. These cards represent the player's characters, and the player must keep them secret from the other players. On a player's turn, they can perform one of two actions:

- Income - Take one coin from the bank
- Action - Use one of their character's abilities

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Each character has a unique ability that allows the player to gain an advantage in the game. For example, the Duke can collect three coins from the bank, the Assassin can pay three coins to eliminate an opponent's character, and the Contessa can block an assassination attempt.

Players can also use their actions to perform a "coup," which allows them to pay seven coins to force an opponent to lose one of their characters.

The game ends when only one player has at least one character remaining. Players can also be eliminated if they lose both of their characters.

One of the key elements of Coup is bluffing. Players can lie about which characters they have in their hand, in order to trick their opponents into making a mistake. For example, a player may claim to have the Assassin in their hand in order to intimidate their opponents, even if they actually have a different character.

Overall, Coup is a fast-paced and exciting game that requires strategic thinking and social skills.

Inspiration:

Coup was created by Rikki Tahta and was first published by Indie Boards and Cards in 2012. Tahta has stated that the game was inspired by his love of bluffing games and his desire to create a game that was easy to learn but still provided a lot of depth and strategy.

According to Tahta, he was also inspired by the game Werewolf (also known as Mafia), which is another game that involves deception and bluffing. He wanted to create a game that was similar in spirit to Werewolf, but that was easier to set up and play.

Tahta has said that he was also influenced by classic card games like Poker and Blackjack, which also involve bluffing and trying to outwit your opponents.

Overall, Coup was created as a way to combine the elements of bluffing and strategy that Tahta enjoyed in other games, while still creating something new and unique.

Topics covered:

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- Social Skills: Coup requires players to interact with one another, negotiate, and bluff in order to succeed. As such, it can help to develop social skills such as communication, persuasion, and reading body language.
- Strategic Thinking: Coup is a game of strategy, and players must constantly be thinking ahead and planning their next move in order to outmaneuver their opponents. This can help to develop skills such as critical thinking, decision-making, and problem-solving.
- Risk Assessment: In order to succeed in Coup, players must be able to assess risk and weigh the potential benefits and drawbacks of each action they take. This can help to develop skills such as risk assessment, probability estimation, and risk management.
- Memory and Deduction: Since players must keep track of which characters have been played and which are still in play, Coup can also help to develop memory and deduction skills.

For the successful game we need:

- Players: Coup is a multiplayer game, and it is best played with at least three or four people. The game can accommodate up to six players, so having a group of friends or family members who are interested in playing is important.
- Cards: Coup requires a standard deck of 15 cards, which can be purchased as a standalone game or as part of a larger card game set. It is important to have a complete and undamaged deck of cards in order to play the game.
- Coins: In addition to the cards, Coup also requires coins (or other tokens) to keep track of each player's money. While any small object can be used as a token, having enough coins or tokens for each player is important to keep the game moving smoothly.
- Understanding of Rules: All players should have a basic understanding of the rules of the game before starting. It can be helpful to read through the instructions together or to have an experienced player explain the rules to everyone.
- Sportsmanship: Coup is a game that can involve bluffing and deception, but it is important to play in a friendly and sportsmanlike manner. Players should avoid personal attacks

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or overly aggressive behavior and should focus on having fun and enjoying the game.

Overall, a successful game of Coup requires a group of players who are willing to have fun, follow the rules, and engage in a friendly and good-natured competition. With these elements in place, Coup can be a fun and exciting game that provides hours of entertainment.

Workshop`s advantage:

- Quick and Easy to Learn: Coup has simple rules and can be learned quickly, which makes it a great choice for classroom games. Students can jump right in and start playing, without needing to spend a lot of time learning complicated rules.
- Develops Social Skills: Coup requires players to interact with one another and negotiate, which can help to develop social skills such as communication, persuasion, and reading body language. These skills are important for students to learn in order to succeed in many areas of life.
- Encourages Strategic Thinking: Coup is a game of strategy, and players must constantly be thinking ahead and planning their next move in order to outmaneuver their opponents. This can help to develop skills such as critical thinking, decision-making, and problem-solving, which are valuable in many academic and professional contexts.
- Enhances Memory and Deduction Skills: Coup also requires players to keep track of which characters have been played and which are still in play, which can help to develop memory and deduction skills.
- Fun and Engaging: Finally, Coup is simply a fun and engaging game to play. It can help to break up the monotony of classroom activities and provide a welcome break for students.

Overall, Coup can be a great choice for classroom games because it is quick to learn, helps to develop a variety of important skills, and is fun and engaging for students.

Card Game HANABI

https://boardgamegeek.com/boardgame/98778/hanabi

Goal:

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To promote cooperation between players, through the need to adopt collaborative strategies and alternative communication.

Description

Hanabi is a cooperative card game for 2 to 5 players, designed by Antoine Bauza and published by Asmodee. The goal of the game is to create five fireworks displays, one for each color of fireworks, by playing cards in ascending order on each display. The catch is that players hold their cards facing outwards, so they cannot see their own cards but can see those of their teammates. This creates a need for players to give each other clues about the cards in their hands without revealing too much information.

The game begins with each player receiving a hand of cards, with the number of cards varying based on the number of players. The players can then take turns either giving a clue to another player or playing a card. When giving a clue, the player must choose a player and a type of clue, either the color or the number of a card in that player's hand. The player can give a clue to all of the cards in that player's hand that match the chosen clue, but not to any other cards. Players must use their memory and deduction skills to remember and deduce information about the cards in their hand.

When a player decides to play a card, they choose a display of the same color and play a card of the next highest number. If the card is the next card in sequence, the display is successfully built up, and the players move on to the next display. If the card is not the next card in sequence, the display is "fizzled", and the players lose a fuse token. The game ends when all of the firework's displays are successfully built, or when the players run out of fuse tokens.

Hanabi is a challenging and fun game that requires communication, strategy, and memory skills. It is a great game for players who enjoy cooperative games and are looking for a unique and challenging experience.

Inspiration:

The designer of Hanabi, Antoine Bauza, has stated that the inspiration for the game came from his observation of people playing other cooperative games, such as Pandemic and Forbidden Island. He noticed that in these games, players often discussed and

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strategized openly with each other, which led him to think about a game where players had to communicate indirectly.

The concept of players holding their cards facing outwards, and having to rely on clues from their teammates to figure out what cards they have, was the central idea behind Hanabi. Bauza wanted to create a game that would require players to be more observant, creative, and communicative than in traditional games, and to challenge their ability to work together towards a common goal.

The idea of building fireworks displays was chosen as the theme for the game, as it provided a colorful and visually appealing backdrop for the gameplay, while also giving players a clear goal to work towards. The result is a unique and engaging game that has become popular with players around the world.

Topics covered:

Hanabi covers several topics in terms of learning, including:

- Communication: Hanabi is a game that requires players to communicate indirectly, using clues to convey information about the cards in their hands without revealing too much. This challenges players to be clear and concise in their communication, and to be creative in how they convey information to their teammates.
- Strategy: Hanabi requires players to think strategically about which cards to play and when, and to anticipate what their teammates might do next. Players must balance the need to play cards in order with the need to conserve clues and fuse tokens, and make strategic decisions based on incomplete information.
- Memory: Hanabi challenges players to remember the information that their teammates have given them about their cards, and to use that information to make informed decisions about which cards to play or discard.
- Deduction: Hanabi also requires players to use deduction skills to infer information about their own cards and their teammates' cards based on the clues they have been given. Players must make logical deductions about which cards are which based on the information they have and use this information to guide their decisions.

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Overall, Hanabi is a game that challenges players to think critically and work collaboratively towards a common goal, while also providing an engaging and enjoyable gaming experience.

For the successful game we need:

- The Hanabi game: This includes the game board, cards, fuse tokens, and clue tokens. Make sure that you have all of the components and that they are in good condition.
- A group of players: Hanabi is designed for 2 to 5 players, so make sure that you have the appropriate number of players for the game.
- A clear playing area: Make sure that you have a clear playing area where players can see the game board and their own cards.
- Good lighting: Since the game relies on players being able to see the colors and numbers on the cards, make sure that the playing area is well-lit.
- An understanding of the rules: Before starting the game, make sure that all players understand the rules and how to play. You can explain the rules yourself or have a player who is familiar with the game explain them.
- Patience and cooperation: Hanabi is a challenging game that requires players to work together and communicate effectively. Encourage players to be patient and supportive of each other, and to work collaboratively towards the goal of building the fireworks displays.

By having all of these elements in place, you can conduct a successful game session of Hanabi that is both challenging and enjoyable for all players.

Workshop`s advantage:

- Cooperative gameplay: Hanabi is a cooperative game, meaning that all players work together towards a common goal. This encourages teamwork, communication, and problem-solving skills, which are valuable in many educational contexts.
- Focus on strategy and deduction: Hanabi challenges players to think critically and strategically about the game, using deduction and memory skills to make informed decisions. This

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can help develop analytical thinking and problem-solving skills, which are useful in many academic subjects.

- Encourages creative thinking: Since players have to communicate indirectly and use clues to convey information, Hanabi encourages creative thinking and imaginative problem-solving. This can help develop innovative thinking skills, which are valuable in many fields.
- Enhances social skills: Playing board games like Hanabi can help enhance social skills such as turn-taking, active listening, and sharing. This can help students build positive relationships with their peers and develop important social skills.
- Fun and engaging: Finally, Hanabi is a fun and engaging game that can help students relax and enjoy themselves while learning. This can help improve motivation, engagement, and overall academic performance.

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