NEWS LITERACY ON BOARD

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RESEARCH ON GAMIFICATION AND GAME-BASED ASSESSMENT

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БИБЛИОТЕКА ГРАДА БЕОГРАДА

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Content

1. About the project NEED

The main aim of this project is using an innovative approach (mainly game-based learning) to teach news literacy skills which are needed to judge the reliability and credibility of news/information and equip individuals with skills they need to become engaged and informed participants in civic life. Game-based learning is an effective active learning technique that uses games to improve learning. The aim of it is to teach something while the learner is playing. It can be achieved through non-digital games (including board games) as well as digital games.

Game-based learning is flexible, highly adaptable and can be updated very quickly. Playing games enhances the ability to think in a critical way, which boosts the capacity to retain information for a longer time. The desired impacts of the project are motivating individuals for self-learning through game playing; using active learning methodology to help long term retainment of newly gained knowledge as a result empowering adults with news literacy skills to foster democracy and social inclusion.

Main objectives of this Project are:

1. Development of innovative game-based learning and assessment methods for adults in news literacy and critical thinking education – creation of educational content and tools: two board games and an online platform.

2. Improving the human and educational resources of 4 partners, associated partners, and other stakeholders Europewide to actively educate citizens in news literacy and critical thinking by using game-based learning method

3. Promoting project's results on the local, national, and European level.

2. Introduction

This review of the topic is focused on collecting useful information for further development of the project NEED where the main goal is to produce a board game that teaches the audience to recognize misinformation, purposeful disinformation – manipulations. There are already many video games, but not so many board games that educate players on news literacy.

Good games are timeless, they work every time, are easy, fun, and educational. This is why it is necessary to get a broader aspect on gamification, game-based learning, game-based assessment. In addition, this review also contains reviews of existing games from both sides,

the newspapers that are struggling to retain readers´ engagement, and the opposite side, the developers of educational games about news literacy.

3. What is gamification?

Gamification is a strategy that integrates entertaining and immersive gaming elements into nongame contexts to enhance engagement and motivate certain behaviours. Gamification uses game design and mechanics, such as badges, leaderboards, points, and rewards, to encourage active participation and make tasks fun and enjoyable.

Gamification is used in various fields, including education, marketing, employee training, health, wellness and customer engagement. For instance, educational applications might use gamification to make learning more engaging for students, while businesses might use it to improve employee performance, encourage customer loyalty, or reward employees and customers. Successful gamification requires an understanding of target audiences, their motivation, and the context in which the strategy is applied.

3.1. Gamification timeline

- **S&H Green Stamps (1896)** – Stamps were distributed as a part of a rewards program designed to encourage customer loyalty.
- **The Boy Scout movement (1908)** – Boy scouts were provided a series of obstacles they would have to overcome to earn rewards. They were recognized for every achievement, ongoing commitment, and involvement.
- Although scouting was mainly used to train boys, it quickly became popular among young girls. **In 1910, feminine units were formed**, often including domestic education programs.
- **The birth of social video games (1970s)** – Sega and Atari introduced arcade games. They were the first social video games. People would flock to arcade centers, gas stations, and restaurants to play the games and earn high scores.
- **The Game of Work (1973)** – Written by Charles Coonradt, the book talks about how fun and games can tackle the problem of reduced employee engagement. Coonradt noticed plummeting productivity as sales in recreation and sports equipment were increasing. He suggested that game mechanics can promote satisfaction, motivation, and productivity.
- **Multi-user dungeon game (1979)** – Gamification takes on a creative approach by combining programming, role-playing, and interactive fiction to inspire users to keep playing. Although its text-based interface was unappealing compared to modern standards, it sparked great interest in online social gaming.

- **The rise of video games in the 1970s and 1980s** influenced early development of gamification. The addictiveness of playing video games and the engagement video gameplay generated sparked interest in applying game elements to other areas. In the 1990s, educational games like Math Blaster and Carmen Sandiego introduced gamification to the classroom. These games aimed to make learning more engaging and interactive.
- **What Makes Things Fun to Learn (1981)** – Thomas W. Malone at the Massachusetts Institute of Technology published a study of intrinsically motivating computer games. This is the first time a gaming initiative has been recognized academically. Computer games showcased inherent abilities to stimulate engagement. He outlined how gaming mechanics can be added to different areas, especially education.
- **AAdvantage (1981)** – American Airlines released the first frequent flier program, a critical factor in promoting customer loyalty.
- **Gaming trends spread to millions (1990s)** – By the 90s, about 30% of American households had a Nintendo home console. Many games were awarding users with points, badges, and achievements.
- **Who plays MUAs (Multi-User Adventures) paper (1996)** – Richard Bartle published a paper explaining why different people play games. He divided game players into different categories: achiever, explorer, socializer, and killer. These categories can determine how the game experience affects its audience. They can be further used in a modern gamification platform.
- **Nick Pelling coined the term "gamification" in 2002**. But, in the second half of 2010, the term saw widespread adoption. Nick Pelling is a game designer tasked with creating a game like a user interface for vending machines and ATMs.

  This British-born inventor and programmer was best known as the creator of the 1984 game Frak. Pelling saw the potential and practicality of in-game mechanics as tools for industry and business. So, he decided to implement his knowledge of games elsewhere.

  As games became increasingly popular, articles started to emerge, outlining the countless uses of gamification. The gamification history helped this concept become a catalyst – a powerful marketing and social tool that can be used in the workplace.

- **Serious Games Initiative (SGI) (2002)** – The Woodrow Wilson International Center of Scholars founded SGI to use games to promote user engagement. Many organizations felt that the word "game" undermined the quality of educational products. So, they preferred the term "Serious Games" for impact games, educational games, immersive learning simulations, digital game-based learning, alternative purpose games, etc. However, the concept of applying game elements to nongame contexts -- such as loyalty programs and customer rewards systems -- has been around for much longer.

- With the success of early gamification efforts, companies like Nike and Starbucks began incorporating gamification into their marketing campaigns and loyalty programs in the **early 2000s**. One example is Nike+, a fitness tracking gamification campaign that Nike launched in 2006 which ranked friends' fitness scores on social leaderboards. This marked the beginning of widespread adoption of gamification in various industries. The advent of smartphones, social media and mobile apps accelerated the popularity of gamification.
- **In 2005, Rajat Pahari released and created the first example of modern gamification** – Bunchball. Bunchball is a cloud-based platform designed to help organizations and businesses use gamification's power entirely.

  The platform uses game mechanics, such as leaderboards, badges, points, and missions, and incorporates them into the work environment.
- **In 2007, some people used gamification in the home**: Kevan Davis developed a web app called Chore Wars that gamified daily chores. It used a collaborative RGP-style system, where users get to work through different quests to protect their homes, like defeating the Sink Rat that hides in the sink.
- **The first-ever gamification summit was held in San Francisco in 2011:** At the summit, M2 Research CEO Wanda Meloni uncovered the first analysis of the Gamification Market, showcasing the potential of gamification becoming a billion-dollar market.

  Summits in San Francisco are drawing thousands of attendees from around the world. This created the perfect opportunity for the impact of gamification and computer games to reach a wide range of audience.
- Gamification has continued to evolve and expand with **advancements in artificial intelligence, virtual reality (VR), augmented reality and immersive technologies**. These technologies offer new possibilities for creating immersive and interactive gamified VR experiences, such as in the Metaverse. Gamification is an effective strategy for VR-based learning.
- **Gamification is now a common feature of software design**. It is used in many commercial electronic devices as an excellent engagement tool. Many other senior executives are already considering making gamification an essential requirement in their workplace.

  Eventually, gamification gained massive attention in a more specific sense, referring to the usage of rewards or social elements of games in software.

3.2. How does gamification work? Game design elements explained

Gamification uses various game context and game design elements to create immersive and interactive experiences for users. The following elements are generally included in gamification platforms:

- **Clear Objectives and Goals**: Define specific, measurable objectives and goals for users to achieve, helping them understand the purpose of the gamified experience and stay focused.
- **Intuitive Design and User Experience:** Create an easy-to-navigate, visually appealing interface that allows users to quickly understand the rules and mechanics, facilitating seamless engagement.
- **Points and badges:** These are fundamental game mechanics that reward users with achievement and progress. Users earn points when they complete specific actions or reach milestones; they are awarded badges for accomplishments or mastery in a particular area. These visual representations of progress incentivize users to keep engaging with the system.
- **In-app currencies (for app games):** You can reward users with in-app currencies to keep them motivated to complete particular tasks and use the earned coins to complete other tasks.
- **Leaderboards:** These display the rankings of participants based on their performance and achievements. They create a sense of competition, challenging and motivating users to earn a higher position on the leaderboard. Leaderboards are good for motivating people to improve their skills and reach goals.
- **Progression and levels:** These let users advance through different stages of the game system as they accomplish tasks or gain points. This visual progress provides a feeling of growth and mastery, and it encourages continued engagement. Unlocking new levels or accessing additional content creates a sense of anticipation and excitement.
- **Balancing Challenges and Skill Levels**: Design tasks with varying difficulty levels that cater to users with different skill sets, ensuring that the experience remains challenging yet achievable.
- **Rewards and incentives:** There are extrinsic motivators to encourage desired behaviours. They can include virtual or real-world rewards, such as discounts, access to exclusive content and prizes. By offering incentives, gamification motivates users to participate and complete tasks as well as increase their overall level of engagement.
- **Role-playing:** The incorporation of a storyline or narrative makes tasks feel more meaningful. Challenges and quests associated with the role-playing adds a layer of connection between the user and their character or storyline, adding an emotional dimension to the game experience.

- **Avatars:** These let users create a visual representation of themselves within the gamified system. They let users express their personalities and expand the immersive experience, increasing engagement, ownership and investment in the experience. Avatars are used outside of gamified systems to represent employees in the enterprise.
- **Teammates:** These provide social interaction that lets users connect, collaborate and compete with others. Features such as social sharing, multiplayer challenges and collaborative activities enhance the sense of community, encourage team collaboration, and create a more engaging and enjoyable experience.
- **Creating a sense of achievement**: Game mechanics like points, levels, and badges give users measurable progress, reinforcing their efforts and making them feel accomplished.
- **Personalizing experiences:** Customizable avatars, goals, and difficulty levels cater to individual preferences, increasing user investment and satisfaction.
- **Fostering learning:** Gamification enhances learning by breaking complex tasks into smaller, manageable challenges, allowing users to apply newly acquired knowledge in a low-risk environment.
- **Constraints**: Using some constraints such as limited time would push users to reach faster and motivate them to take action.
- **Journey:** Journeys make the user's interaction with the game easier and understandable. You can use them for onboarding by disclosing features as the user progresses in your app.
- **Feedback and Progress Tracking**: Provide real-time feedback and progress tracking to help users gauge their performance, learn from mistakes, and feel motivated to continue improving.
- **Social Interaction and Competition:** Foster a sense of community and friendly competition by integrating social features, leaderboards, and collaborative tasks, which can spur users to stay engaged and strive for better results.

3.3. What are the benefits of gamification?

Gamification offers key benefits in various contexts:

- **Increased engagement:** Gamification enhances active user engagement by making tasks more enjoyable, interactive and rewarding. Gamification efforts have been shown to increase customer engagement in particular.
- **Motivation and behavioural change:** Game systems drive desired behaviours by providing incentives, positive feedback loops and a sense of progress. In various contexts, they motivate participants, encourage healthy habits and improve learning outcomes.

- **Improved learning and retention:** Gamification in education makes the learning experience more interactive and immersive, increasing student engagement and knowledge retention. By incorporating game mechanics into educational materials, students are more likely to stay focused and retain information.
- **Social interaction and collaboration:** Gamification is an effective team collaboration tool, fostering social interaction and collaboration through features such as leaderboards, multiplayer challenges and community forums.
- **Data and analytics:** Gamification provides valuable user data and data analytics on user behaviour, user preference and user performance. Such data can be used to optimize the gaming experience, personalize content and inform decision-making.
- **Increased brand loyalty and customer satisfaction**: By incorporating gamification into marketing campaigns and loyalty programs, businesses can enhance brand and customer loyalty as well as customer satisfaction. Rewards, challenges and personalized experiences create a more enjoyable and memorable customer journey.

3.4. Drawbacks of gamification

While gamification is effective in many contexts, it comes with several drawbacks:

- **Lack of intrinsic motivation:** Gamification relies heavily on extrinsic motivators like rewards and incentives, which can undermine intrinsic motivation and lead to a dependence on external rewards.
- **Overemphasis on competition:** Leaderboards and competitive elements can create a sense of exclusion and demoralize individuals who may not perform as well as others.
- **Superficial engagement:** Gamification can result in superficial engagement, where users are primarily focused on earning points and rewards rather than truly immersing themselves in the experience.
- **Resistance to change:** Some individuals resist game-based initiatives, perceiving them as forced or manipulative. It's crucial to communicate the benefits and value of gamification to overcome this resistance.
- **Design and implementation challenges:** Designing effective gamified experiences requires careful planning and consideration of user preferences. Gamified systems with poor digital experience can fail to engage users or achieve desired outcomes.

3.5. Use cases and examples of gamification

Gamification has been successfully implemented in different industries and contexts. Gamification examples include the following:

- **Marketing and customer engagement:** Companies such as McDonald's, Nike and Starbucks use games to encourage customer engagement and loyalty. Loyalty programs, mobile apps and interactive marketing campaigns often incorporate game mechanics like point systems, badges and rewards to motivate customers to interact with a brand.
- **Workplace training and employee engagement:** Gamification has proven effective in enhancing workplace training and improving employee engagement. Companies such as Deloitte and IBM have used gamified training programs to increase knowledge retention, encourage collaboration and motivate employees to complete training modules.
- **Health and wellness**: Health and wellness apps and platforms use gamification to motivate individuals to adopt healthier lifestyles. Internet of things apps such as Fitbit and MyFitnessPal use game elements to track physical activity, set goals and reward users for achieving milestones. This gamified approach encourages users to stay active and make healthier choices.
- **Education and eLearning:** Game-based learning and e-learning has transformed education, making learning more interactive and even fun. Online learning platforms, such as Duolingo and Khan Academy, incorporate game elements to engage learners in subjects such as language learning and maths. Gamified learning platforms provide immediate feedback, progress tracking and rewards to motivate students.
- **Productivity and task management:** Task management apps, such as Asana and Trello, use gamification to increase productivity and help users stay organized. By incorporating elements like achievements, progress bars and leaderboards in game systems, these apps make completing tasks more enjoyable and provide a sense of accomplishment.
- **Fundraising and crowdsourcing:** Fundraising and crowdsourcing campaigns use gamification techniques to encourage participation and contributions. Gamification elements create a competitive and rewarding environment, encouraging individuals to get involved, collaborate, share ideas and support causes.

3.6. Best practices for implementing gamification

The successful implementation of gamification requires some best practices and guidelines. The following are most critical:

- **Define clear objectives.** The goals and objectives of the gamification initiative should be clearly defined. In addition, the behaviours and outcomes desired as part of participation should align with a company's overall business culture and objectives.
- **Understand the target audience.** The preferences, motivations and needs of the target must be considered when creating and implanting a system. The gamified experience should be adapted to generational marketing factors and tailored to the target audience's interests and expectations.
- **Provide meaningful rewards.** Rewards in a game system should be valuable to the target audience. Ensure they're aligned with the desired behaviours and provide a sense of accomplishment.
- **Design for user experience**. The system should have a seamless and intuitive user experience. Game elements must be easy to understand and navigate. Clear instructions and feedback help with this aspect.
- **Regularly update and evolve.** Keep the gamified experience fresh and engaging by regularly updating content, adding new challenges and introducing new features. This prevents users from becoming bored and disengaged.

3.7. Understanding the Audience of Gamification

3.7.1. Bartle's Categories

As discussed before, it is very important to understand the audience of a gamified platform. People will not remain engaged in something that does not meet their expectations or is otherwise not fun. It is also important to understand yourself and your own gaming habits. By recognizing what types of games and game elements appeal to you specifically, you can better recognize how gamification is affecting you. Are you over-competitive and have to get the top spot of the leaderboard? Maybe you are a social butterfly who loves interacting with a game's community. These are all traits gamification seeks to key in on. Luckily there is a relatively simple system to start making those identifications. Richard Bartle released his research on Multi-user Adventure players in 1996. Bartle categorized his players into four groups, which roughly show how they interact with the game and other players and what they hope to get out of the game experience. The categories include Socializer, Killer, Achiever, and Explorer, divided among a four-quadrant grid. The two axes are acting vs interacting and players vs world. Bartle's player grid and an example outcome of taking the Bartle Test are included in the pictures here.

Figure 1: Sheme of Barte`s player types

In the sections below, the four quadrants of Bartle's grid will be explored. Each section will be explained in terms of their habits and what they might hope to get out of a game or gamified experience. Next, some examples of the types of games these people might play and why will be discussed. Finally, some methods and game elements to include when gamifying for that group will be described.

3.7.2. Socializer

The largest group of game players fall into the Socializer quadrant, which are estimated to make up about 80% of the population. According to the grid, this means that they prefer to interact rather than act and do so with other players rather than the environment. To state it simply, as the name suggests, they prefer to socialize and interact with other players. Socializers spend time chatting and working with others, usually with the goal of forming a stronger relationship and getting to know the other person. They understand that working together allows them to accomplish or create something better than doing it alone. Also, they tend to be good at roleplaying, willing to immerse themselves in a character if it increases the value of their social interaction. Socializers are not often competitive on an individual level; however, they will act competitively for a group. The sense of belonging to a team can drive their actions in this regard.

Socializers thrive in games that reward social interaction, such as most Facebook games. Farmville, for example, allows players to travel to others' farms and water their plants. The other person is helped by having the plants freshly watered, while the player is rewarded with new plants. Additionally, these actions are often reciprocated, which helps create the social interaction that these players crave. Socializers also find a home in Massively Multiplayer Online Role-Playing Games (MMORPG), where the large user population affords them plenty of social opportunity. These games often have dungeons and quests that are specifically designed for group encounters, with the best rewards usually requiring great

teamwork and coordination. Many MMORPGs, such as World of Warcraft, also have built in guild systems, a type of social group that exists specifically for completing segments of the game together and each other's benefit. These cycles of player interaction and reward are very important for a Socializer.
Gamifying something for a Socializer is about finding ways to add more social opportunities. For example, creating a game out of a forum, where people are rewarded for information sharing and discussion, is a good way to engage a socializer. Socializers also enjoy decorating avatars, so a game with an avatar or a personalization tool is a good option. Generally speaking, Socializers will react positively to most gamification attempts if it has some type of mingling component. On the other hand, Socializers do not always react well to leaderboards and competitive outlets. Because of their cooperative nature, being on the top of the board is not a major concern. For similar reasons, badges and achievements are not very effective with them either.

3.7.3. Explorers

The next quadrant on the grid is Explorer. Explorers favour interacting over acting and the game world over players. Simply put, they like to interact with the environment of the game itself, not the other players populating that environment. They make up 10% of gamers. As the name suggests, Explorers like to discover new things about the game they are playing. They tend to favour large detailed games to explore and experiment on, seeing what secrets they can uncover. These are the types of players that will work to fill out the entire map in open-world games or will scour their environment for Easter Eggs. Explorers also like to have a deeper understanding of the game and mechanics. For some Explorers, knowledge of the game itself and discovery go together. Explorers can be at home in many types of game environments, only being limited by the amount there is to discover in the game. However, they are most at home in role-playing and Simulation Games. Explorers enjoy role-playing games because these usually have large interactive worlds and multiple outcomes for any given scenario. A game with multiple paths and outcomes, or one that has an open-world, presents many more avenues for exploration and discovery. Games like Elder Scrolls V: Skyrim can keep an Explorer entertained for weeks. They also enjoy Simulation games because of the possibilities to be found. Creating and simulating gives the Explorer a sandbox environment to try as much as they want and experiment to their heart's desire. Seeing how different objects in the game interact with each other and what the result is satisfies these players' thirst for knowledge. In this case, games like Minecraft or SimCity are ideal for Explorers.

To gamify for an Explorer involves adding many details and intricacies to an application. The game elements must have enough depth for these players to not lose interest too quickly. One thing to consider is adding Easter Eggs into the application, or tiny extra details that can only be found by searching with great care. Easter Eggs have become a staple of modern game design for this reason and are often just a simple nod to a classic game or jab at a

competitor. Hidden collectible objects in an application can also give them something to seek. Puzzle and logic activities keep them entertained as well. As for game elements to avoid, Explorers are often disengaged by the same things as Socializers. They fail to see the point in leaderboards and care more about their own knowledge of the application than any specific achievements. Additionally, too much required socializing may be a drawback for them, if it takes away from the time that could be spent discovering and experimenting.

3.7.4. Achiever

The next quadrant is the Achiever, which favours acting over interacting and the game world over other players. Achievers like to act on the world they are inhabiting and are thought to make up roughly 10% of the game playing population. They love systems with points and levels, badges and achievements, and really anything that can be considered a status symbol. Achievers tend to be very competitive with others, especially each other, and use their various status symbols to distinguish themselves from their peers. These players will often boast of a method they found to increase their level quickly or gain ranks more efficiently. Somewhat a side-effect of constantly increasing their standing, Achievers are often more apt to “grind” in a game or do something considered tedious for their eventual gain. However, even these players will not toil away for a disproportionately low reward.

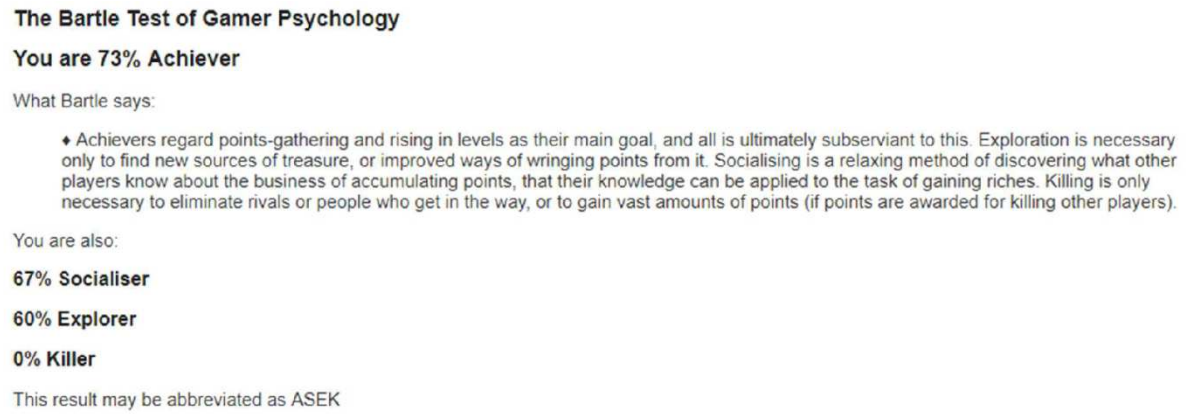
Achievers are generally not picky about their genre of game, so long as they can still accomplish something worth bragging to their friends about. Any type of game with scores that can be objectively compared will attract Achievers. Whether that be a win to loss ratio in a competitive game or having the highest score in a level, if it can be used to show rank then it will work for them. That said, games with ranked competitive modes are often a good home for Achievers. For example, popular Multiplayer Online Battle Arena (MOBA) games, such as League of Legends and Smite, place their players into ranks and tiers based on their performance in qualifying matches. Tiers make it easy for these players to determine where they currently sit and to what heights they can climb. Other games with trainable skills gain large populations of Achievers, where mastery of a skill is the ultimate reward for potentially dull training. This behaviour is most evident in the MMORPG RuneScape, where level grinding was the norm. Creating a gamified application with Achievers in mind can mean many things. The obvious answers are leaderboards and badges. These simple grading mechanisms are a quick way to engage achievers. However, there are other ways to capture this group without ostracizing the Explorers and Socializers, who do not often like leaderboards. For example, implementing a levelling system gives Achievers a status symbol to chase that may not put off other players. Experience toward the levelling system could even be gained through social interaction or exploration, helping to include the other groups as well. Incentivization schemes, like Airline Miles, can motivate them if the individual tasks are well defined, because these players are not afraid of repetitive tasks. Achievers can be convinced to search for collectibles like an Explorer if there is a decent level of difficulty to

doing it. One key thing to avoid with an Achiever is a vague outcome or reward for completing a task. Achievers are comfortable with tedious or menial tasks if they know what they are getting out of it. Failing to define a reward system, whether it be an actual reward or just a title or badge, will cause these users to lose interest faster than anything else.

3.7.5. Killer

The last quadrant on Bartle's diagram is the Killer, a player who seeks to act on other players in the game. Killers are estimated to be the least common of the four quadrants, with less than 1% of players falling into this category. It should also be stated that Killers are not as violent and ominous as the name suggests. They are very similar in their game playing habits to Achievers in that they are very competitive and want to climb the leaderboards of whatever game they are playing. The key difference is that, along with winning, Killers want to see others lose. They strive to be the very best and impose themselves on others, never to be ignored. Interestingly enough, their hyper competitiveness often leads to them exploiting glitches or flaws in the game, especially when it can help them get a leg up on the competition. Lastly, Killers must be careful to not take their competitiveness too far, as they sometimes frustrate the other players around them. As one might expect, Killers are most often found in games where you kill for points. Games like Call of Duty and Halo are great locales for them to compete and win against other players. However, strategy games like Age of Empires are very much within a Killer's domain, preferring to rush attack their opponents and dominate them militarily. Developing a strategy that will crush the majority of other players is very satisfying to these players.

Overall, they lean towards directly competitive games that have some level of skill involved so that they can prove their superiority over everyone else. Gamifying something with a Killer in mind is very difficult. The issue is not that they are necessarily hard to develop something for, but that their preferences and habits can easily ostracise the other players. Socializers and Explorers are generally not interested in the Killers' hyper competitive ways, while Achievers will become frustrated as the Killers seek to make them lose. Therefore, even a leaderboard or point system implementation can be dangerous with a Killer making the experience uncomfortable for others. Having covered the four Bartle categories, it is important to understand that the categories are not mutually exclusive. Players fall predominantly into one of the four categories but can heavily display characteristics of another, or all four. In fact, when taking the Bartle Test, players are given percentages based on how closely they align with a given category. These are presented in descending order. For example, I am labelled as ASEK, or Achiever, Socializer, Explorer, then Killer. The percentages are 73%, 67%, 53%, and 7% respectively. This means that I display the highest amount of Achiever characteristics, but also will act as a Socializer or Explorer for significant portions of time. I very rarely act as a Killer. Below is a sample Bartle test score, though not the exact one discussed here.


The Bartle Test of Gamer Psychology

You are 73% Achiever

What Bartle says:

♦ Achievers regard points-gathering and rising in levels as their main goal, and all is ultimately subserviant to this. Exploration is necessary only to find new sources of treasure, or improved ways of wringing points from it. Socialising is a relaxing method of discovering what other players know about the business of accumulating points, that their knowledge can be applied to the task of gaining riches. Killing is only necessary to eliminate rivals or people who get in the way, or to gain vast amounts of points (if points are awarded for killing other players).

You are also:

67% Socialiser

60% Explorer

0% Killer

This result may be abbreviated as ASEK

Figure 2: Example of test score

Because the categories are not exclusive, a sound strategy can sometimes be to gamify to the secondary trait of some audience members. For example, if you have a group of eight potential users, you might have 5 Socializers, 2 Achievers, and an Explorer. Upon further examination, it may be that the Achievers and Explorer have Socializer as their second highest characterization. This would allow the application to be gamified based predominantly on Socializer tendencies, with maybe some smaller concessions to the other groups working into it. This is a good way to get around the issues presented by Killers as well.

4. Gamification in education

4.1. Gamification in education – Why?

Gamification in education is the use of game mechanics and elements in an educational environment. According to Gabe Zichermann, the use of game mechanics improves the abilities to learn new skills by 40%.

Implementation of game elements in education is logical since there are some facts that are typical for the games and training. Users' actions in games are aimed at achieving a specific goal (win) in the presence of obstacles. In education there is a learning objective, which has to be achieved by performing specific learning activities or interaction with educational content. Tracking the players' progress in games is an important element, because next steps and moves are based on their results. In education tracking the students' progress is essential to achieve the learning objectives. Students' learning path is determined by the achieved levels of knowledge and skills (Glover, 2013).

Game approaches lead to

- **higher level of commitment and motivation** of users to activities and processes in which they are involved.
- **Game mechanics are familiar to consumers** as most of them have played or continue to play different games.
- **Collaboration in education is a milestone for the effective implementation of active learning**. Unlike training, games possess a strong competitive element. The focus in the learning process should be rather towards developing skills for collaboration and teamwork and responsibility for the performance of the group instead of competition between students.

The **main problems** in modern education are related to **the lack of engagement and motivation of students to participate actively in the learning process**. Because of that, teachers try to use new techniques and approaches to provoke students' activity and motivate them to participate in training. Gamification is not directly associated with knowledge and skills. Gamification affects students' behaviour, commitment and motivation, which can lead to improvement of knowledge and skills. Therefore, one possible solution is to reward the efforts and achieved results by awards, which leads to increased motivation for participation and activity. That decision is based on the use of game elements in the learning process.

E-learning, based on modern ICT, creates favourable conditions for the implementation of gamification – the processes of processing students' data and tracking their progress are automated and software tools can generate detailed reports.

4.2. Gamification in education – how?

The development of an effective strategy for the implementation of gamification in e-learning implies a depth analysis of existing conditions and available software tools. The main steps of the strategy include:

4.2.1. Determination of learners' characteristics

When teachers implement new approaches in the learning process it is essential to define students' characteristics (profiles) in order to determine whether the new tools and techniques would be suitable. The key and decisive factors are the predisposition of the students to interact with the learning content and to participate in learning events with a competitive nature. It is essential for teachers to establish and take in mind what skills are required by the participants to achieve the objectives – whether the tasks and activities require special skills by learners. If tasks are very easy or difficult, there is possible demotivation of learners and negative outcomes. Students' motivation to participate in

training depends on the context of the learning process and what follows from their achievements.

4.2.2. Definition of learning objectives

The learning objectives have to be specific and clearly defined. The purpose of education is to achieve the learning objectives, because otherwise all activities (including gamification activities) will seem pointless. The objectives determine what educational content and activities to be included in the learning process and selection of appropriate game mechanics and techniques to achieve them.

4.2.3. Creation of educational content and activities for gamification

The educational content should be interactive, engaging, and rich in multimedia elements. The training activities should be developed tailored to the learning objectives and allow:

- Multiple performances – the learning activities need to be designed so that students can repeat them in case of an unsuccessful attempt. It is very important to create conditions and opportunities to achieve the goal. As a result of repetitions students will improve their skills.
- Feasibility – the learning activities should be achievable. They must be tailored and adapted to students' potential and skill levels.
- Increasing difficulty level – each subsequent task is expected to be more complex, requiring more efforts from students and corresponding to their newly acquired knowledge and skills.
- Multiple paths – to develop diverse skills in learners, they need to be able to reach the objectives by various paths. This allows students to build their own strategies, which is one of the key characteristics of active learning.

4.2.4. Adding game elements and mechanisms

The key element of gamification is the inclusion of tasks that learners must perform. The performance of tasks leads to accumulation of points, transition to higher levels, and winning awards. All these actions are aimed at achieving predetermined learning objectives. Which elements will be included in training depends on the defined objectives (what knowledge and skills should be acquired because of the task). Activities that require independent work by students bring individual awards (such as badges). Activities requiring interaction with other learners are the social element of training, they make students a part of a big learning community and their results are public and visible (such as leaderboards).

5. What is a game-based assessment?

Game-based assessments are games that allow employers to measure candidates' **knowledge, skills, values, personality, motivation, and competencies**. The term falls under a broader category of "**serious games**" - "games that do not have entertainment, enjoyment, or fun as their primary purpose".

Williams - An expert in people assessment for recruitment and development has put down 4 common approaches to game-based assessments as follows the use of pre-existing video games that are not specifically designed for assessment to extract or measure relevant criteria. The creation of games specifically designed for assessing purposes (both custom and ready-to-use). The adaptation of "traditional" assessments (i.e implementing gaming factors/design elements into existing assessments). The deployment of VR technology to promote "game-like" assessment experiences.

These features are designed to provide a comprehensive and accurate evaluation of a person's abilities, while also engaging and motivating them to perform their best.

Game-based assessments can be used in various settings:

- For example, in education, game-based assessments may be used to measure students' understanding of a particular subject
- In a hiring setting, game-based assessments can be used to evaluate employees' job-related skills and competencies.

Research has shown that games reflect true scores better than conventional tests. As a result, allowing employers to identify the most promising candidates and hire for potential rather than just past performance.

5.1. Removes bias from the recruitment process

Human evaluations of candidates are influenced by our unconscious biases. Stereotyping Bias, Confirmation Bias, and dozens of other biases will result in wrongly favouring one candidate over another.

Game-based assessments purely rely upon scientific insights, limiting the interference of biases and instead providing objective data about candidates.

Game-based assessments can help employers identify a wider and more diverse talent pool by providing a more engaging and accessible assessment method that appeals to a broad range of candidates.

5.2. Game-based assessment vs. Gamification

Despite being used interchangeably, these two terms are different. Gamification is broadly described as “the application of game mechanics, elements, and features to non-game environments”.

Some examples of gamification include:

- badges,
- leaderboards,
- feedback,
- points, and
- prizes.

Some key features of game-based assessments include elements such as:

- Scoring systems
- Feedback mechanisms
- Time limits
- Challenges that increase in difficulty as the assessment progresses.

The main difference between these two concepts lies in the purpose of use. While game-based assessments are entitled to the assessing purpose, gamification focuses on the implementation of gaming elements to engage people.

5.3. Game-based assessment vs. Digital interactive assessment

Another term that is often mistaken for offering the same meaning as “game-based assessment" is digital interactive assessment.

Digital assessments are traditional psychometric tests that have been made interactive and available via digital access. You still must work with the same kind of test content, but in a different format. Instead of circling the answer on paper, you now take the test on a digital platform. You can click or move the answer to indicate the answer choice.

These do not measure behaviours, but rather provide a better test-taking experience compared to traditional test-taking methods.

5.4. Measuring different aspects with game-based assessments

Gamification can be applied to anything, it's not a concept invented to measure specific traits. Rather a concept that was created to change the world of assessments. However, game-based assessments measure two aspects most predictive of job performance:

Cognitive Ability/General Mental Ability (GMA), which has proven to be the most significant predictor of work performance, with a correlation of 0.65-0.74.

Behaviour, which has proven to be a significant predictor of work performance, with a correlation of 0.45.

These measurements provide valuable insights into someone's competencies, behaviours, and responses to certain situations they might face in the workplace.

There are different classifications and types of game-based assessment, the type of classification depends on the aspect that the classification is made on.

5.4.1. First classification

There are two common types of game-based assessments including:

- A group of single games with each game assessing a specific skill (i.e 12 games in Pymetrics)
- Scenario-based games (i.e McKinsey Solve) that measure a set of skills by putting candidates in various contexts (i.e survival mode, business situation, etc.)

5.4.1.1. Single game-based assessments

Single game-based assessments are parameters for individual competencies (i.e) numerical reasoning, verbal reasoning, etc. or certain skills (i.e decision-making, risk-taking, etc.). Typically, you may be asked to complete a set of game-based assessments with each being an assessing piece of a bigger and more well-rounded evaluation.

These games may not ask you questions relating directly to what is being evaluated, but rather provide you with general instructions for playing the game. They adopt certain game tactics to measure your abilities and competencies.

Take the Pymetrics Balloon Game as an example. In this game, you will be given a balloon and with each balloon pump, you are awarded a certain amount of money.

However, the balloon is set to explode at a random point during this pumping process. You can either collect all the money at any time or keep pumping to earn more. Yet, you will lose all your hard-earned money once the balloon pops. Based on the amount of money you receive or the number of pumping times, this game will help evaluate your risk tolerance and decision-making abilities.

Another example is Gridlock designed by Revelian. This is a part of the Revelian Cognify Test which assess problem-solving skills, numerical reasoning ability, and verbal knowledge. In this Gridlock game, you will be asked to solve a sequence of spatial puzzles at a fast pace by fitting Tetris-like shapes into a 3x3 grid. By using this game, hiring managers can have a better assessment of candidates' problem-solving skills.

Employers can learn a lot from the game-playing process of candidates. For candidates, these games vary significantly, and therefore, it's impossible to learn a single correct way to tackle every game.

Some employers that are currently adopting single game-based assessments in their recruiting procedures include PWC, Deloitte, Citi, KPMG, and e-on.

5.4.1.2. Scenario-based games

Scenario-based games help employers measure a set of skills by putting job applicants in specific contexts. Several variations of scenario-based games include problem-solving games, job-simulation game-based assessments, behavioural assessments, etc.

Take the famous McKinsey Solve as an example of scenario-based problem-solving games. With each mini-game within Solve, candidates will be given a specific problem and have to work out the solution. Both the final result and the process (including clicks and mouse movements) will be taken into account. The game will evaluate candidates on 5 different dimensions: Critical thinking, Decision-making, Meta-cognition, Situational awareness, and Systems thinking.

Another example is the job simulation task designed by the Talent games. This game is built around hypothetical scenarios of real situations encountered in the workplace, and candidates will have to present their responses to those scenarios. Once candidates finish this assessment, results are mapped against a set of competencies chosen by each employer. The final report helps reveal whether candidates align with the values and behaviours of a particular company. Coca-Cola is one of the companies using such a job simulation task in their hiring process.

5.4.2. Second classification

There are several different types of game-based assessments, each designed to assess different aspects of a person's abilities.

- Cognitive games
- Behavioural games
- Emotional intelligence games
- Situational judgement games
- Simulation games

5.4.2.1. Cognitive games

These games are designed to test a person's cognitive abilities, such as memory, attention, problem-solving, and decision-making.

Example of a cognitive game: For a customer service representative job, a game that tests their memory, attention, and ability to task-switch efficiently.

5.4.2.2. Behavioural games

These games are designed to assess a person's behaviour, such as communication skills, teamwork, leadership, and conflict resolution.

Example of a behavioural game: For a sales role, a game that tests the candidate's negotiation and persuasion skills.

5.4.2.3. Emotional intelligence games

These games are designed to evaluate a person's emotional intelligence, including their ability to recognize emotions in themselves and others, regulate their own emotions, and empathize with others.

Example of an emotional intelligence game: For a customer-facing role, a game that tests the candidate's ability to recognize and manage their emotions and handle difficult customers with empathy.

5.4.2.4. Situational judgement games

These games are designed to evaluate a person's ability to make decisions in realistic scenarios.

Example of a situational judgement game: For a project manager role, a game that tests the candidate's ability to prioritize tasks, manage stakeholders, and resolve conflicts.

5.4.2.5. Simulation games

These games are designed to simulate real-life situations and assess a person's ability to deal with them effectively.

Example of a simulation game: For the transportation industry, a game that simulates driving a vehicle and tests the candidate's ability to react to different traffic situations.

These are just a few examples, and the choice of game-based assessment will depend on the specific requirements of the job role and the competencies being evaluated.

5.5. How do game-based assessments measure candidate performance?

Game-based assessments measure candidate performance by collecting data on various aspects of the game, such as the candidate's interactions, decisions, and outcomes. These are called **objective measurements**.

To sum up: instead of focusing solely on the outcome, game-based assessments consider the process of getting to the said outcome.

The data points gathered about the candidate are then used to generate a candidate report that provides insights into the candidate's strengths and weaknesses.

5.6. General candidate perception of game-based assessments

The perception of game-based assessments among candidates is generally positive – gamified assessments create an environment and atmosphere that directs a person's attention away from the feeling of being assessed, thus reducing anxiety. This makes

gamified assessments more attractive to candidates and consequently more enjoyable to take part in.

Moreover, candidates indicate that they perceive an assessment to be fairer in a gamified format, rather than the traditional format. The main reason for this is that gamified assessments collect more data points and focus more on how candidates behave in a game, rather than their answers only.

In other words: There's more room to show what you got. And that makes it feel much fairer for candidates.

5.7. Before starting game-based assessments

There are a few things candidates should consider before starting game-based assessments:

- Ensure that the environment the assessments are being completed in allows for concentration and has little to no distractions.
- Game-based assessments usually can be completed both on mobile and desktop. If the candidate is completing the assessments on a desktop, it's wise to use a mouse instead of a touchpad.
- Make sure there is a stable WiFi network connection.
- Reading instructions presented during the assessments carefully is also important.

5.8. Preparation for game-based assessments

As the assessments vary from company to company, and from test provider to test provider, it's difficult to prepare one for all. However, there are a few tips that might help you perform better on your real test.

- **Figure out the test provider:** This information is often disclosed in your invitation email to take the test. If not, you can also ask your hiring contact to see whether you can have such information. Once knowing your test provider, you can prepare more strategically and effectively by looking for similar game practices or jotting down important notes from the test provider's official guide.
- **Practice beforehand:** As you know what to practise, you can focus on practising to improve your score on the real test. Useful sources for your practice include similar games and game trials on the test provider's official website. For example, Test Partnership provides candidates with free practice of its MindmetriQ on the website. Criteria Corps also make its GAME practice available on the website.
- **Read the instruction:** When taking the test, it's essential to read the instruction carefully. This helps you know exactly what to do and makes you aware of the time

limit. Sometimes, you might be off guard after seeing and reading all the prep guides prior to the test. Nevertheless, the real test's instructions might differ and you have to read the instructions to avoid missing important information.

5.9. Common game-based assessment providers

The most popular test providers within this testing area include Arctic Shores, Pymetrics, Test Partnership, Aon, and Revelian.

5.9.1. Arctic Shores

Arctic Shores' game-based assessment measures a variety of behavioural and cognitive traits. These traits are grouped into five pillars of the OCEAN model of personality which include:

- Openness to experience
- Conscientiousness
- Extroversion
- Agreeableness
- Neuroticism

They also provide game-based assessments for measuring candidates' cognition - a part of a larger picture in determining how candidates will perform at work. Well-known companies and businesses adopted Arctic Shores' game-based assessment in their hiring process including PwC, KPMG, HSBC, Coca-Cola, Siemens, etc.

5.9.2. Pymetrics

Pymetrics is a famous game-based assessment provider with its 12 games (balloon game, keypress game, digits memory game, arrows game, lengths game, cards game, tower game, money exchange game 1, money exchange game 2, hard or easy task guide, stop game and faces game). These core games evaluate 9 soft skills.

- Effort
- Risk Tolerance
- Decision Making
- Attention
- Focus
- Learning

- Fairness
- Generosity
- Emotion

5.9.3. Test Partnership

Test Partnership has a series of game-based assessments called MindmetriQ. There is a total of six games with each lasting from 4 to 7 minutes and measuring certain aspects of your cognitive ability.

- **Pipe Puzzle**: You have to swap the tiles until the two pipe ends are connected. The time countdown will be shown on the right of your devices. Upon finishing the game within the time allowance, you will see a little animation of a blue dot racing to its destination.

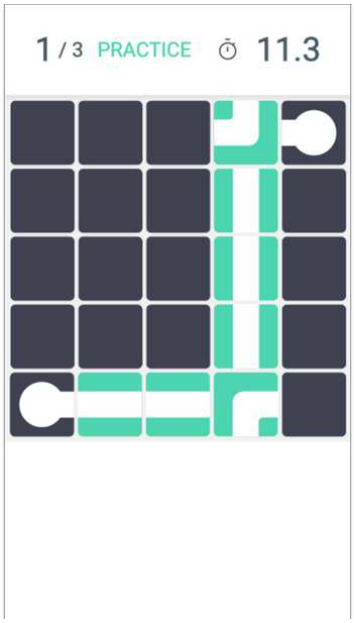


Figure 3: Example of the game, Source: Test Partnership

- **Shape Spinner:** This is one of the trickiest minigames in the set. You will be presented with different pairs of shapes. While the shapes on the outside remain fixed, the shapes on the inside can be rotated. You have to match each shape based on a set of rules, either shape or shade match, yet never both. To indicate your answer, you can use your mouse or arrow keys to rotate to the inner circle and match the shapes.

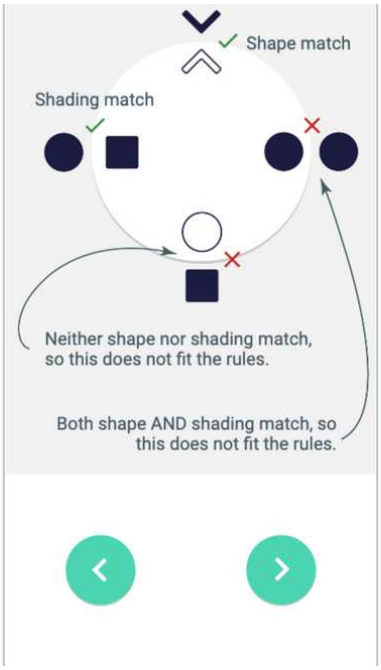


Figure 4: Example of the game, Source: Test Partnership

- **Word Logic:** This game is technically known as a logical syllogism. There are 5 options for you to pick the correct answer. In addition, you have three opportunities to increase your time limit for each question by 15 seconds.

Figure 5: Example of the game, Source: Test Partnership

- **Link Swipe:** There are different pairs of words appearing on the screen. As you play the game, you have to swipe left, right, or down to indicate whether these words are synonyms or antonyms of each other, or completely irrelevant.

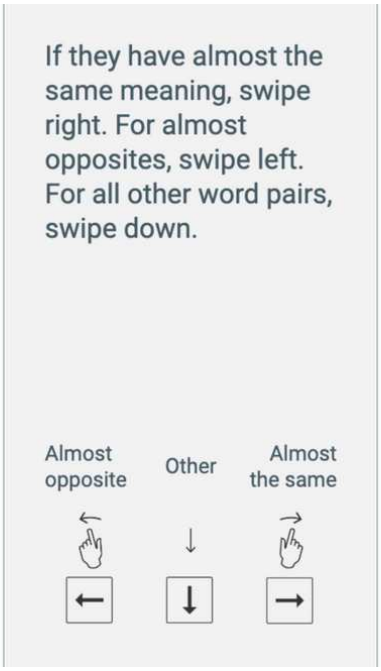


Figure 6: Example of the game, Source: Test Partnership

- **Net the Numbers:** When in the game, you have to drag a grey net across a grid of numbers. All numbers that are within this net will count towards a sum. The ultimate goal is to drag the net and gain the highest sum possible.

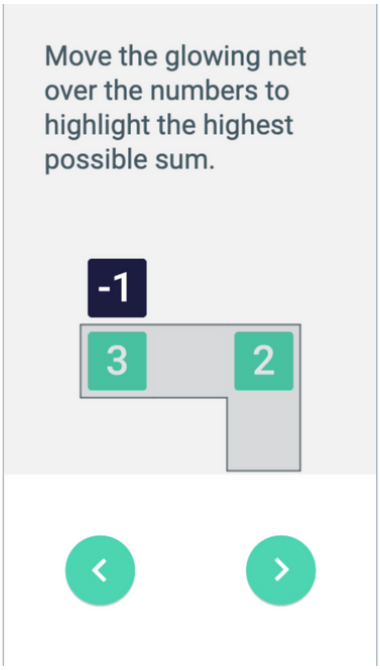


Figure 7: Example of the game, Source: Test Partnership

- **Number Racer:** You will be controlling an arrow representing a car, and you can move it left and right across the screen bottom of your device. From the top of the screen, there are blocks containing numbers dropping down. The game will give you a specific number to reach. You can catch the falling blocks or avoid them to reach the target number.

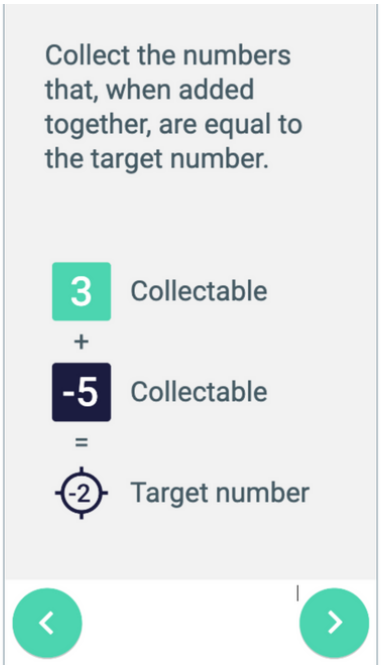


Figure 8: Example of the game,Source: Test Partnership

5.9.4. Aon

Aon is famous for its smartPredict with four game challenges.

- **switchChallenge:** This is a game-based version of a diagrammatic or abstract reasoning test, where you are asked to select which code option helps rearrange the shapes in the sequence above to achieve the shape sequence below. There will be different levels, and you can unlock the next level upon the successful completion of the current level. The sequences become more difficult as you progress, and you must follow two or more rearranging codes to go from the top sequence to the bottom sequence.
- **digitChallenge**: You have a specific time allowance to solve an equation by entering missing numbers. In the game, you are presented with the answer, blank spaces for filling in the numbers, the operators between these (i.e plus, minus, division, and multiplication signs), and a set of numbers for you to select what to enter.
- **motionChallenge:** This minigame resembles the famous Rush Hour Traffic game. In this game, you have to get the ball to its goal by clearing its path and moving the

blocks standing in its way. It's important to note that each level is timed and your moves are counted.

- **gridChallenge:** This is a memory game, and you will have a few seconds to memorize a dot's position on a grid. As the original presentation disappears, there are two images asking you to identify if they are mirror images of each other or not. Once you finish that distracting task, you will be asked to give your answer on the original position of the dot on the grid.

5.9.5. Revelian

Revelian (now acquired by Criteria Australia) is a game-based assessment provider for emotional intelligence, decision-making skills, and level of innovation evaluation.

2 common types of Revelian game-based assessments are:

- **The Revelian Cognify Test.** This gamified test includes up to six games, with three assessing problem-solving skills, two measuring numerical reasoning ability, and one evaluating verbal knowledge.
- **The Revelian Emotify Test.** This exam includes two separate assessments: one is the matching faces task, and one is the emotional ties test. Both assessments are designed to measure candidates' ability to correctly perceive emotions.

5.10. Companies that use game-based assessments

As game-based assessments gain popularity, there are many companies already adopting such tests in their pre-employment process. The list includes famous names below.

- PWC
- Deloitte
- Citi
- KPMG
- Unilever
- Coca-cola
- Colgate-Palmolive

6. Game-Based Assessment in Education

Game-based learning in education is more popular than ever. Proven to motivate and engage students, digital learning tools are used in classrooms across the globe. But it's not just students who are benefiting from game-based e-learning. Educators are also benefiting thanks to game-based assessments that provide opportunities for interactive assessments, formative assessments, and summative assessments.

Read on to learn about 10 types of game-based assessments, and 10 ways educators can use them to evaluate student learning and progress.

6.1. Tops 10 Types of Game-Based Assessments Available in Digital Learning Tools

Educational games for students online offer various game-based assessments to evaluate learning outcomes.

- **Adaptive Assessments**

Some educational games for students online incorporate adaptive assessment algorithms. These algorithms custom-tailor the difficulty and content based on students' performance. These formative assessments successfully adjust the level of challenge to provide educators with an accurate measure of students' abilities.

- **Collaborative Assessments**

Multiplayer or cooperative digital learning tools allow students to work together to achieve a common goal. These gamified assessments help evaluate teamwork, communication, and collective problem-solving skills within the game's context.

- **In-Game Quests or Missions**

Game-based e-learning tools often feature quests or missions that students must complete to progress. These quests provide interactive assessments by evaluating students' ability to apply knowledge, decision-making, and problem-solving skills within the educational video game context.

- **Knowledge-Based Questions**

Game-based e-learning tools frequently include multiple-choice, true/false, or fill-in-the-blank questions to assess students' factual knowledge. These questions can be integrated into the gameplay (interactive assessments) or presented at specific checkpoints (summative assessments) to provide both formative assessments and summative assessments.

- **Mini-Games and Challenges:**

Digital learning tools in the classroom regularly include mini-games or standalone challenges focused on highly specific learning objectives. These activities provide game-based assessments of student's understanding of particular concepts or skills.

- **Performance Metrics**

Game-based assessments included in digital learning tools from top K12 education companies typically offer performance metrics. Performance metrics track students' progress and performance in real-time, providing formative assessments for educators. Metrics often include scores, completion times, accuracy rates, or other gamified assessments that measure that indicate mastery or progress.

- **Progress Reports and Analytics**

Educational games for students online usually generate progress reports or analytics that summarize students' performance, achievements, and areas for improvement. These game-based assessments provide valuable insights for teachers and students who can use them to track progress over time.

- **Reflection and Self-Assessment**

Game-based assessments may include reflection prompts or self-assessment features. Reflection and self-assessment are types of interactive assessments that empower students to evaluate their performance and understanding. These types of game-based assessments may also help promote metacognitive skills and self-awareness.

- **Skill-Based Challenges**

Game-based learning often incorporates skill-based challenges that require students to apply their knowledge or demonstrate specific skills in real-time. These in-game challenges involve problem-solving, critical thinking, logical reasoning, or creative tasks within the game environment. Educators can then evaluate skills based on end-of-game summative assessments in teacher dashboards.

- **Simulations and Virtual Labs**

Educational games from top K12 education companies frequently simulate real-world scenarios or "virtual labs". Real-world scenarios encourage students to apply knowledge in practical situations. These game-based assessments can be embedded within the simulations to evaluate decision-making, critical thinking, and problem-solving skills.

6.2. Tops 10 Ways Educators Can Evaluate Learning Outcomes from Game-Based eLearning

Although game-based assessments are inherently useful, they are made even more powerful when educators use the following strategies to maximize the benefits of gamified assessments.

- **Authentic Assessments**

Educators may opt to design interactive assessments that require students to apply the knowledge or skills acquired through the video game to real-world scenarios. These authentic game-based assessments may involve creating projects, solving problems, or demonstrating their understanding in practical contexts.

- **Clear Learning Objectives**

Educators can maximize the effectiveness of game-based assessments by clearly defining the learning objectives desired from game-based e-learning. These objectives should always align with the curriculum or specific learning goals.

- **Comparative Analysis**

Teachers can get the most from educational games for students online by comparing student performance in a game to performance via traditional instruction. Doing so can illustrate the effectiveness of specific game-based e-learning tools while providing a holistic view of students' progress.

- **Interviews and Discussions**

Teachers may find that conducting individual or group interviews after gameplay provides an honest summative assessment of a specific game's effectiveness. During these discussions or interviews, educators may probe students to glean insight into their understanding of the content covered in the video game.

- **Game Analytics and Progress Reports**

Most digital learning tools offered by top K12 education companies include built-in analytics and progress-tracking systems. Teachers should utilize these game-based assessments to review individual or class-level data, including the student's performance, progress, and areas needing improvement.

- **Observation and Note-Taking**

Yet another way educators can evaluate learning outcomes from game-based learning is to observe students interacting with the video game. Educators may choose to take notes on their progress, document engagement levels, assess problem-solving approaches, and evaluate how students overcome challenges they encounter.

- **Peer Evaluation**

Encouraging peer-to-peer evaluation and collaboration within the video game can be an effective way to capitalize on interactive assessments for entire classrooms. Students can provide feedback to their peers based on specific criteria or learning goals. It not only fosters a sense of teamwork but also allows students to assess their knowledge and performance.

- **Before-and-After Game-Based Assessments**

Educators can administer before and after game-based assessments to measure students' knowledge or skills before playing the game and then again after engaging with the video game. This type of summative assessment can help educators determine the extent of learning that has taken place.

- **Rubrics and Scoring Guides**

Developing rubrics or scoring guides that outline the specific criteria for evaluating students' performance within the video game can be a great way to measure the effectiveness of game-based learning tools. Rubrics or scoring guides may include factors such as completing certain levels, achieving specific scores, or demonstrating mastery of certain concepts or skills.

- **Teacher-Student Feedback**

Providing each student or team of students with personalized feedback on their performance within the video game is an excellent strategy for evaluating the usefulness of specific educational games for students online. Teachers may choose to highlight areas of strength and areas for improvement before guiding students toward additional resources or activities to deepen their understanding.

Game-based assessments should be ongoing and flexible, allowing for adjustments based on feedback and observations. It's best to strike a balance between assessing learning outcomes and fostering an enjoyable and engaging learning experience using digital learning tools.

7. Gamification platforms and tools

Thankfully the technology of gamification software now offers many tools to offer a game-based learning experience.

The following list in alphabetical order will give you a solid idea of what gamification tools can work for you and the experience you can create for your students.

- **Duolingo**

Duolingo is a free online language gamification app offering 94+ language courses. It boasts 500 million+ users worldwide. And the Duolingo for Schools app offers teachers and its users a fun, gamified way to teach language involving personalized and self-paced assignments.

Meet students where they are by utilizing their personalized learning engine. With customizable assignments and lessons, teachers can cater to their learning objectives with ease.

- **Arcademics**

Arcademics makes multiplayer educational games—free math games, free language arts games, and more for K-8 students. With Arcademics Plus, teachers and parents can view analytics and reports that allow customization of game content. Arcademics games play out on the iPad and Android app.

- **Jotform Quiz Maker**

Jotform Quiz Maker is a supercharged tool that allows users to build dynamic quizzes and polls. The product offers many features, such as conditional logic and calculations, that can be used to create unique quizzes for everyone and score them. Jotform also allows users to keep track of all of their submissions and manage their data with automated dashboards, graphs, reports, and an analytics tool. The quizzes can be embedded into a website, shared with a link or QR code as well as easily built into a no-code mobile app.

- **Xperiencify**

Xperiencify is a revolutionary gamification platform that uses seven psychological triggers, such as urgency, FOMO, and social proof, that drive engagement rates through the roof. Instructors can use gamification elements such as points, countdowns, and leaderboards to motivate students to reach course completion goals. When used correctly, course creators can expect completion rates 10-30 times higher than the competition.

- **Brainscape**

Brainscape boasts of being the world's most brilliant flashcard app. Brainscape uses cognitive science gamification software that optimizes studying by repeating more challenging concepts in perfect intervals to maximize memory retention. You can bet there is a flashcard for every possible application. And if you cannot find a flashcard deck in their robust database, you can create your own.

- **Cerebriti**

Cerebriti, created in Spain, is a gamification software platform that offers two distinct angles to the learning process. First, students create their educational games, and second, they play other students' or teachers' games to consolidate their learning process. There are games on all subjects for all ages, and they are multi-platform.

- **BookWidgets**

BookWidgets is a gamification software that serves all educators, including; elementary teachers, middle or high school teachers, university professors, and professional trainers. BookWidgets also offers 40+ digital exercise templates that work on smartphones, tablets, or computers. BookWidgets is a fast and efficient grading system that provides feedback to

students and teachers, allowing them to assess problem areas or where students may need extra attention.

- **ChemCaper**

ChemCaper is a video game platform developed by school teachers that teaches fundamental chemistry concepts to teenagers aged 10 to 14 years old. Students report that they remembered 90% of concepts learned in 6 months after playing the game for the first time. Based on chemistry concepts and the Periodic Table, students can explore unique environments, craft potions, and battle with collectible creatures.

- **Course Hero**

Course Hero focuses on filling the gap between college and the workplace. The gamification features are fundamental, with achievement badges for accomplishments like logging on during the weekend, uploading documents, and completing classes. There's a sitewide leaderboard but lacking here is community or interaction between students. Course Hero's strengths are its study resources, 24/7 homework support, textbook solutions and explanations, and expert tutors.

- **Edmodo**

Edmodo is a free app that mirrors the functionality of a social media network for educational purposes. It provides tools that allow teachers and users to send messages, share training materials, and make learning accessible anywhere. In addition, Edmodo communicates with parents keeping them up to speed on class updates, allowing them to sync with their children's teachers and support learning at home. And lastly, parents can see classroom activities and grades to support their children's progress.

- **Classcraft**

Classcraft promotes social and emotional learning (SEL) through its gamification software. Class Craft is a mobile game app where students create their avatars complete with special powers to navigate the classroom, its rules, and deadlines collaboratively. You can utilize Class Craft to get students fully interacting with the rules of your classroom and beyond. And it is a perfect classroom management tool for high school students.

- **Genially**

Genially is a platform to gamify your presentations by making them interactive and fun. Genially works to elevate the learning experience by allowing you to import any presentation by offering rich animation and gamifying anything from quizzes to escape rooms filled with interactivity. Also, Genially offers a myriad of templates to plug and play your existing content into so that you can be up and running fast.

- **Virtonomics**

Virtonomics is a business simulation offering student engagement through a gamified experience in economics, entrepreneurship, competition, marketing, finance, sales, production, strategy, innovation, startup development, R & D, HR, supply chain

management, and more. It boasts an online community of 1 million players from all over the world engaging in various business platform simulations. The intended audience for these games is businesspeople, entrepreneurs, and university and college students.

- **Gimkit**

Gimkit is a gamification software that offers a live learning game show experience with constant updates, new modes, and power-ups that keep the game fresh and relevant. Students answer questions on their own devices and are presented the same questions in multiple ways to ensure mastery of a topic. Students' rewards come with in-game cash by answering questions correctly, but at the same time can lose some money by answering incorrectly, motivating them to be thoughtful with their answers. Gimkit can be used outside of the classroom as homework, which facilitates automatic grades for you.

- **Kahoot!**

Kahoot! offers a game show environment to get students excited about learning. Particularly useful in the school setting for quizzing vocabulary, multiplication, and simple geography. And Kahoot! provides support to many learning settings such as school, work, and home. Kahoot! is utilized by more than 1 million+ players annually in more than 200 countries. Kahoot! is used in the US by over 50% of teachers and 97% of Fortune 500 companies.

- **ClassDojo**

ClassDojo is an app that connects teachers with students and parents. The Class Dojo app focuses on younger children of primary school age. Creating a positive culture by working hard, being kind, or just helping others, Class Dojo is brilliant at fostering or strengthening new behaviours. Teachers can also keep parents in the loop by communicating the story of their classrooms by instantly sharing photos, videos, and announcements or by privately messaging with any parent. And Class Dojo will always be free for teachers.

- **Knowre**

Knowre is an online maths program platform that supports the needs of all students with a personalized online maths curriculum for each student, instructional support at every step, and an intuitive online maths interface. Comics are used for grades six and above to introduce lessons and provide a fun visual learning experience. Knowre Math provides standards-based instruction for Grades 1-12 with over 70,000 rigorous practice and real-world application problems organized into topic-specific lessons.

- **Minecraft: Education Edition**

Minecraft: Education Edition is a gamification tool based on the award-winning video game Minecraft. The Minecraft: Education Edition offers features designed for teaching, pre-built lessons, and cross-curricular support. Meeting children where they are by incorporating a gaming platform that kids are excited about and have brand loyalty with possesses the keys to unlocking the education process in a new, refreshing, and exciting way.

- **CodeCombat**

CodeCombat is a video game platform that teaches students how to code through play. With CodeCombat's unique gamification software, students learn to play and write code from the start of their adventure in the game. CodeCombat focuses on beginners learning Python, Javascript, and C++ programming languages. Teaching over 20 million students Computer Science, CodeCombat teaches students to be critical, confident, and creative learners regardless of experience.

- **Monster Kit**

Monster Kit is a board game aimed at primary school children allowing 1 to 10 players. It allows you to practice creative skills by utilizing drawing, reading, writing, doing calculations, and fostering imagination by developing funny monsters.

- **GooseChase**

GooseChase is gamification software that allows you to run real-world scavenger hunts. There are multiple ways to use Goose Chase; virtual teams, recreation, onboarding, campus orientation, and K-12 education. In addition, Goose Chase offers real-time game action that includes a live leaderboard and activity feed, reward points for outstanding submissions, and a reporting dashboard analytics to measure success.

- **Pear Deck**

Pear Deck is a way to create interactive presentations in the classroom or remotely. Pear Deck seamlessly integrates with Google or Microsoft-based systems, so there is no need to learn a new system. Students can interactively respond to questions in real-time that allows teachers to communicate feedback immediately. These responses can take the form of dragging and dropping pins, drawings, multiple-choice, short text, giving students a website, and providing a numbers-only reaction.

- **Quizizz**

Quizizz is an online app that allows teachers to quiz and test students in the classroom interactively or at home. Quizizz offers gamified quizzes, polls, and lessons that can be led by a presenter or self-paced. Students can join from any device with a web browser and use their iPhone and Android Apps. Teachers know instantly what's working and what's not with real-time reporting and key performance indicators (KPI).

- **Socrative**

Socrative is a gaming app that offers everything from quizzes to polls and is 100% free to all students. Offering three customizable game modes called "space race" aimed at accuracy and speed, your typical question and answer mode, and "Exit Ticket" aimed at assessing how well lessons create a learning experience. You can use Socrative on smartphones, tablets, laptops, and computers.

- **PlayBrighter**

PlayBrighter allows you to set your students on missions to complete specific learning objectives in a gamified manner. From spelling to science, French vocabulary, to the Fibonacci sequence, the games employ over 15,000 possible questions you could ask and gives you the ability to add your questions. Utilizing avatars, students can add personas to their learning experience to accomplish learning objectives making the game more interesting.

- **Toovari**

Toovari is a multi-player platform created and developed in Spain. It allows you to create a class where you can invite students and test their knowledge via game mechanics. Toovari also includes assessments and communication with parents providing a robust environment that capitalizes on the latest technologies.

- **Quizlet**

Quizlet is a multi-national American company offering digital flashcards, matching games, electronic practice assessments, and live quizzes similar to Kahoot!. Available in English, German, Spanish, Chinese, Japanese, Korean, Portuguese, Polish, Russian, French, Indonesian, Dutch, Italian, Turkish, Vietnamese, and more. It is an excellent study aid for anything that requires memorization in a fun, gamified manner.

- **Trivenet**

Trivenet is a free online trivia game created by a teacher to gamify the learning process. In addition, it allows you to set up your own trivia game, allowing students to engage with your specific learning objectives. And lastly, Trivenet is now available in a downloadable app for android platforms.

- **Breakout EDU**

Breakout EDU offers 1,800 kit-based digital games that span every grade level. Games are available for core subjects like Math, Science, History, and general topics such as holidays, team building, and more. Through Breakout EDU's puzzle-based game design, students' critical thinking and creativity are put to the test as teams explore clues to create the perfect lock combinations to solve the puzzles. And many more. The selection of platforms and tools is enormous and still expanding.

8. Games as Tools for Education on Fake News

Bombarded with news misinformation, different games showed up that teach the audience to recognize misinformation as such. Despite access to reliable information being essential for equal opportunities in our society, current school curricula only include some notions about media literacy in a limited context.

There are many video games that teach the audience to recognize fake news, and researchers are evaluating their performance. Here is a summary of one article about video games: Evaluating Video Games as Tools for Education on Fake News and Misinformation, by Ruth S. Contreras-Espinosa, and Jose Luis Eguia-Gomez.

It is necessary to create scenarios for reflection on and a well-founded analysis of misinformation. Video games may be an effective approach to foster these skills and can seamlessly integrate learning content into their design, enabling achieving multiple learning outcomes and building competencies that can transfer to real-life situations. They analysed 24 video games about media literacy by studying their content, design, and characteristics that may affect their implementation in learning settings. Even though not all learning outcomes considered were equally addressed, the results show that media literacy video games currently on the market could be used as effective tools to achieve critical learning goals and may allow users to understand, practice, and implement skills to fight misinformation, regardless of their complexity in terms of game mechanics. However, they detected that certain characteristics of video games may affect their implementation in learning environments, such as their availability, estimated playing time, approach, or whether they include real or fictional worlds, variables that should be further considered by both developers and educators.

Despite there being many games aimed at teaching about fake news or privacy, among others, it is not clear how they serve as educational tools for media literacy, which competencies or content they focus on, and how these are delivered through game design. Most studies are limited to the scope of one game and its effects or centred around one particular aspect of media literacy. Moreover, there is a lack of studies focusing on the practical aspects of game implementation in educational settings.

The purpose of this research is to contribute to filling this research gap by conducting a quantitative analysis of a pool of media literacy video games while adopting a broad and multifaceted understanding of media literacy.
For this study, they utilized the definition of “media literacy games” as games whose purpose extends beyond entertainment, focusing on media literacy, and which, through their design, are explicitly oriented towards one or more of the key themes, skills, or competencies associated with media literacy, thus connecting with a broader field of research centered on the use of digital or tabletop games for education or behavioural change.

These two tables below explain what this research was focusing on:

Table 1: List of Learning Outcomes Considered

No.	Learning Outcomes Considered
1	Understand the consequences of believing and sharing false information for society and the individual.
2	Understand the reasons why disinformation is published with the intention to mislead.
3	Know that some political or commercial interests try to affect online behavior.
4	Have a general idea about how algorithms affect what we see online.
5	Understand what some examples of credible sources of information are.
6	Know how to check information and know the changes in the media landscape.
7	Know how to defend oneself from threats and risks on social media.
8	Know how to be a positive and responsible player on social media.
9	Know how to create fake news.

Table 2: Evaluation criteria for learning outcomes and game mechanics

No.	Content: Learning Outcomes	Design: Game Mechanics
0	Non-consideration of learning outcome	Not present
1	Learning outcome addressed indirectly	Low impact on the game
2	Learning outcome addressed metaphorically	Relative impact on the game
3	Learning outcome addressed explicitly	High impact on the game

Table 3: List of media literacy video games and characteristics

The list of 24 video games shows that development of such games is very much active.

No.	Video Game	Year	Age	Availability	Playing Time (min)	Characteristics
G1	The Republica Times	2012	12+		15+	+ °
G2	Interland	2017	12+		30+	- °
G3	Bad News	2017	12+		30+	+ °
G4	Fake It to Make It	2017	16+		30+	* ^ -
G5	Go Viral!	2018	12+		30+	+ °
G6	Fakey	2018	12+		15+	+ °
G7	Post Facto	2018	12+		15+	+ °
G8	Cranky Uncle	2020	12+		15+	+ °
G9	Harmony Square	2020	12+		20+	+ °
G10	Choose your own fake news	2020	12+		20+	+ °
G11	Adventures of Literatus	2020	14+		30+	- °
G12	Stop the troll	-	14+		20+	+ °
G13	BBC iReporter	2020	14+		30+	^ -
G14	Cat Park	2022	14+		60+	^ -
G15	EU vs. Disinfo Quiz	2022	14+		15+	+ °
G16	NewsFeed Defenders	2023	16+		60+	+ °
G17	Julia: A Science Journey	2023	12+		20+	+ °
G18	Political Animals	2016	16+	ab	60+	* - ^
G19	Headliner	2017	14+	ab	45+	- °
G20	No Place for the Dissident	2020	16+	ab	60+	* - °
G21	Floor 13: Deep State	2020	18+	ab	60+	* - °
G22	Influence Inc.	2022	16+	ab	60+	* - ^
G23	Power & Revolution 2022 Edition	2022	16+	ab	60+	* + ^
G24	Forge of Destiny	2023	12+	ab	45+	+ °

a Has a fee, b Available on STEAM, * Re-playable, + Uses real news, - Uses fictional news, ^ Constructivist approach, ° Behaviorist approach.

8.1. Conclusion of the article

In the present study, they analysed 24 video games focused on media literacy by scrutinizing their content (learning outcomes according to the curriculum of reference), the way in which the content is delivered through their design (game mechanics), and the features that might impact their implementation within educational environments. The growth in the number of games focused on fake news reflects the increasing importance of media literacy and the fight against misinformation in our current times. The content, mechanics, and dynamics of video games could offer a high degree of effectiveness in achieving critical learning outcomes for media literacy, allowing users to understand, practice, and implement these skills to combat misinformation. Likewise, these can foster sharper critical thinking and greater responsibility when consuming and sharing information, which is essential in an increasingly connected world. By integrating elements of news creation and distribution, video games offer a more immersive and challenging experience than other tools, and players directly experience the consequences of their actions in a controlled environment.

Although in some cases the objectives within a video game may be considered negative, such as obtaining powers through violence (as in G21, G22, and G23 in the analysed sample), the knowledge acquired can be applied ethically in the real world. Ultimately, the insights gained through video games can promote the development of critical thinking skills and making ethical decisions in various contexts outside the game. However, we found that some game characteristics may influence the suitability and usefulness of video games for media literacy teaching and their ease of implementation in the classroom.

Estimated playing time should be considered when choosing a media literacy video game in a formal education setting, as re-playable games, though extremely beneficial for learning purposes, tend to be longer (60 min or more) and are, therefore, more difficult to incorporate into typical one-hour subject sessions or toolkits for educators, such as Get Your Facts Straight!: Toolkit for Educators and Training Providers. Fortunately, most of the media literacy games found on the market today have estimated playing times that would fit these frameworks.

Target audiences also determine whether a video game can be used as a tool within the educational system or not, as only games aimed at players under 18 could typically be employed. It seems, though, that nearly all media literacy video games available on the market as of today (except for one item) are directed toward younger audiences and, therefore, are suitable for media literacy teaching purposes in schools.

Video game availability, particularly pricing and distribution platform, is a variable that educators should also evaluate before choosing a video game, as it greatly affects accessibility. While popular platforms such as STEAM increase the reach of video games and topics, these typically require a fee and individual subscriptions, which may hinder their implementation in collective settings such as educational environments. However, most media literacy video games are free and accessible.

The learning approach of a video game should be carefully considered before choosing it as a tool. Those based on behaviourism focus on repetition and constant practice, and the student plays a somewhat passive role. On the other hand, constructivist video games encourage critical thinking, active participation, and problem-solving. With the latter, educators should mainly act as guides. Even though the constructivist approach is more desirable for learning purposes, most of the video games on media literacy on the market incorporate a behaviourist approach.

Last, educators should ponder whether they prefer using a tool that employs real information, or video games depicting fictional worlds. Those that include real news may contribute to more awareness of the world at a given time and promote critical and grounded discussions, but they may rapidly become obsolete in our ever-changing world and constitute a distraction from learning objectives due to controversial issues being brought up. Most of the available video games on media literacy focus on real news. Regarding

crucial learning outcomes for media literacy, we discovered that more than half of the video games on the market were very complete and addressed all the learning objectives as set out in the curriculum of reference (Get Your Facts Straight!: Toolkit for Educators and Trainers); most of them did so in a metaphorical or explicit manner.

These comprehensive tools were mostly free of charge, not restricted to a platform, and short enough to facilitate their implementation in the classroom, offering educators a broad range
to choose from. Most of the video games addressed the issue of credible sources of information (learning outcome 5). Other robust learning outcomes identified within the analysed sample that tended to be addressed explicitly include knowing how to distinguish real and fake news (learning outcome 4) and knowing how to be a responsible player on social media (learning outcome 8). In contrast, the topics that seemed represented least and in a poorer manner were why disinformation is published with the intention to mislead (learning outcome 2) and the issue of political and commercial manipulation of information (learning outcome 3), which are crucial to navigating the Internet and social media nowadays. While not all considered learning outcomes were equally addressed, the findings demonstrate that certain media literacy video games currently available in the market could be harnessed as
effective tools to attain critical learning objectives.

By playing the video games in their entirety, we were able to identify the most common game mechanics present in media literacy games. Most video games opt to focus on requesting the player to differentiate between true and false news (game mechanics 1 and 4), but those that better engage the player incorporate a variety of mechanics, including news creation and distribution on social media and facing the consequences of these actions (game mechanics 2, 3, and 5). This allows players to be involved in a more active way, encouraging decision-making and reflection on the impact of misinformation in society. Challenging the player about their knowledge about political or current topics was the least used method (game mechanic 6), which is somewhat positive, as focusing too much on controversial issues may distract students from the learning process.

They also observed that the complexity of game design in terms of mechanics did not have a direct relationship with how comprehensive a video game was regarding the inclusion of media literacy learning outcomes. Thus, video games may empower users to grasp, exercise, and deploy skills to counter misinformation, regardless of the intricacies of gameplay mechanics.

As a practical example of the implementation of video games as an educational tool, educators may use the most robust game in terms of learning outcomes identified in this study (G22) to present students with a fictional scenario and situations involving the evaluation and verification of information, challenging them to discern between real and

fake news. Through questions, decisions, and searches for reliable sources (outside the game), students can develop skills to identify and question misleading news in the real world.

After analysing the main characteristics of media literacy video games, we can conclude that, despite the great effort of developers to incorporate this issue as a response to an increasing preoccupation, developing teams would benefit from a closer collaboration with educators to ensure that the video games produced can become effective and useful tools that can be smoothly integrated into formal education. Understanding how critical skills for media literacy are best addressed through video games and what mechanics best deliver these is a paramount area for future research, to ensure that video games can be effectively incorporated into curricula in this age of mis- and disinformation characterized by a lack of scenarios that promote critical thinking and initiatives that address media literacy. The development of research in the area of video games that employ fictional worlds and constructivist approaches is also of great importance for the determination of their educational potential as pedagogical tools, as the current media landscape is likely to be filled with new fictive worlds that have a great prospect for pedagogical purposes besides mere entertainment. It would also be crucial to develop more studies on video games that focus on crises, such as wars and pandemics, very relevant issues that motivated some of the objectives of the YO-MEDIA project. However, research in this area faces certain limitations, such as the reduced amount of video games available on media literacy as compared to other topics and the lack of databases or repositories that compile such initiatives.

Finally, in the future, the use of other data analysis or processing techniques could be considered, once we have a larger dataset and a greater number of analysed video games.

For more information about this research please check out the literature section where you can find this research and the list of others.

9. Five newspapers turn to gamification to boost reader engagement

Figure 9: Fantasy Funds – game that targets audience of digital newspaper

It seems that spreading misinformation and fake news has its consequences on engagement of news readers and probably also viewers. Five prominent European newspapers decided to leverage gamification in their media strategy to increase reader engagement.

Those are:

- Dagens Næringsliv (Norway)
- Dagbladet Børsen (Denmark)
- Dagens industri & Privat Affärer (Sweden)
- Finanz und Wirtschaft (Switzerland)
- Kauppalehti (Finland)

An interesting fact is that while all these newspapers offered the same, white-labeled Fantasy Funds stock market game to their audiences, each game was distinctly customized to meet the individual publications' needs and requirements.

Let's have a closer look at the different media strategies and their reader engagement approaches through the Fantasy Funds game.

9.1. The Name of the Game

If you're not yet familiar with Fantasy Funds, here's what this game is all about:

Fantasy Funds is an award-winning B2B stock market game that empowers newspapers to captivate and register a multitude of players on their websites. The game supports commercial partnerships for newspapers and provides a range of flexible options for converting users into loyal subscribers. For readers, Fantasy Funds offers an exceptional opportunity to acquire risk-free stock market investment skills, combined with incentives to return such as the prospect of winning prizes, ranking on leaderboards, or competing with friends and colleagues.

9.2. Dagens Næringsliv – Norway

Dagens Næringsliv (DN) has successfully hosted its Fantasy Funds games for several years. This immersive experience has become an integral component of DN's reader engagement strategy, prompting DN to introduce to new elements in its 2023 game:

- Compete against 7 national high-profiles DN invites players to compete against 7 national high-profile persons, who are all successful people in their occupational fields. Amongst them are a politician, a real estate owner, a former influencer, a luxury watch seller, and a hedgefund investor. Once a player has created his/her portfolio, (s)he can compare its performance with one of those profiles.
- VIP exclusive leagues: Another unique feature this year is DN's creation of a "DN-league", a league reserved for the newspapers' subscribers only where players can compete for a 10,000kr (€1,000) grand price. Replicating this principle, DN has expanded this approach and created a handful of other leagues for exclusive participation in collaboration with key partners and sponsors. As such, several specific university leagues were created in association with these institutions to allow their students to participate and offer a fair chance to compete and win in their respective leagues.

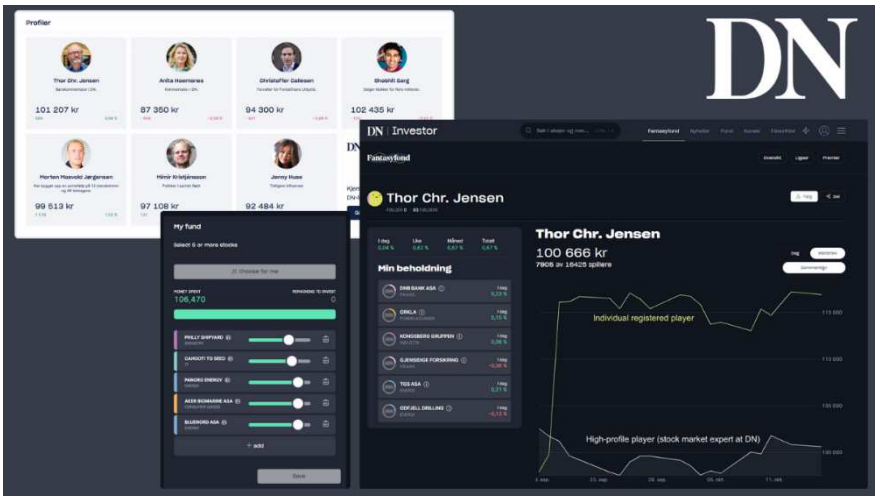


Figure 10: The layout of the game

9.3. Dagbladet Børsen – Denmark

Like DN, Børsen has been running its Fantasy Funds games over several years. This autumn, Børsen implemented two new game features that other newspapers didn't offer.

- **Subscribe to unlock the creation of a second portfolio** Players have the option to create a second portfolio and increase their chances to win. This function is reserved for subscribers, prompting free players to convert to loyal subscribers.
- The more, the merrier! Players are incentivised by creating a league or a player pool and inviting their friends and colleagues to join the game. The more players participate in the pool, the larger the pool prize which players can win. This is a great motivation to top into individuals' networks and familiarize more users with the newspaper brand.

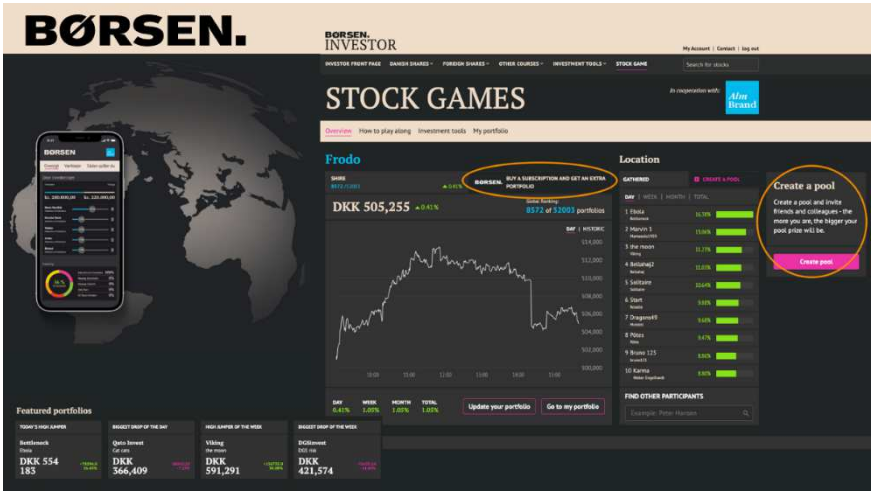


Figure 11: The layout of the game

9.4. Dagens industri & Privat Affärer – Sweden

For the first time, not one, but two newspaper brands have joined forces to co-host a Fantasy Funds game. Both newspapers, under the ownership of Sweden's Bonnier AB, have come together to introduce their respective readers to one another. Dagens industri offers comprehensive coverage of general business and finance news, while Privat Affärer specializes in in-depth financial analysis and focuses on stock investment, savings, retirement planning and related topics.

This unique media partnership creates bridges between the diverse realms of finance reporting, leveraging in-house resource by sharing and building out respective networks in a period where the industry is undergoing difficult times.

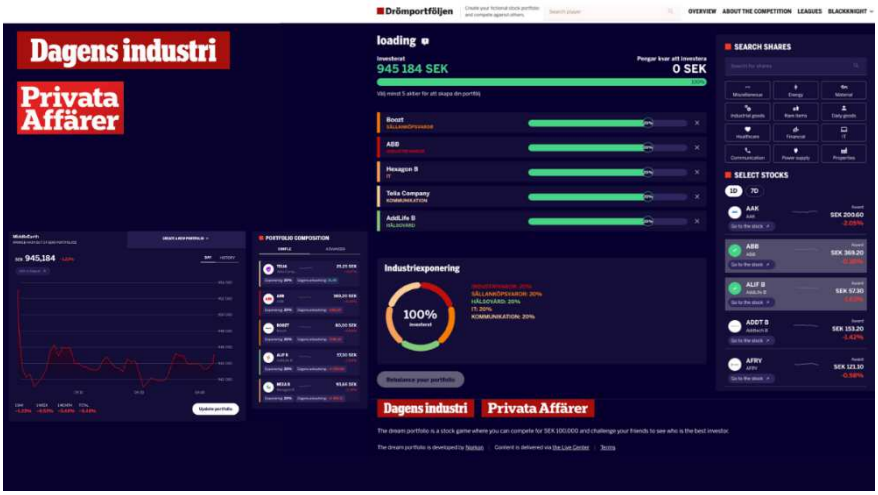


Figure 12: The layout of the game

9.5. Finanz und Wirtschaft – Switzerland

For the first time, Finanz und Wirtschaft (FuW) has introduced a stock market investment game such as Fantasy Funds. With a pre-launch period of two weeks ahead of the official game start date, the newspaper already registered 12,731 players by the second competition day. FuW implemented successfully-proven strategies such as allowing users to compete and compare their portfolios against national high-profile players. What truly stood out from FuW's game were:

- **Great registration page** FuW scored high on a great design and informative registration page. The page included a full overview and comprehensive details about the game, which made it very easy for users to get motivated and join the game.
- **Prize page** Similarly, the award page benefited from a clear design and offered a detailed overview of the weekly prices and grand price to be won, while highlighting sponsoring partners.

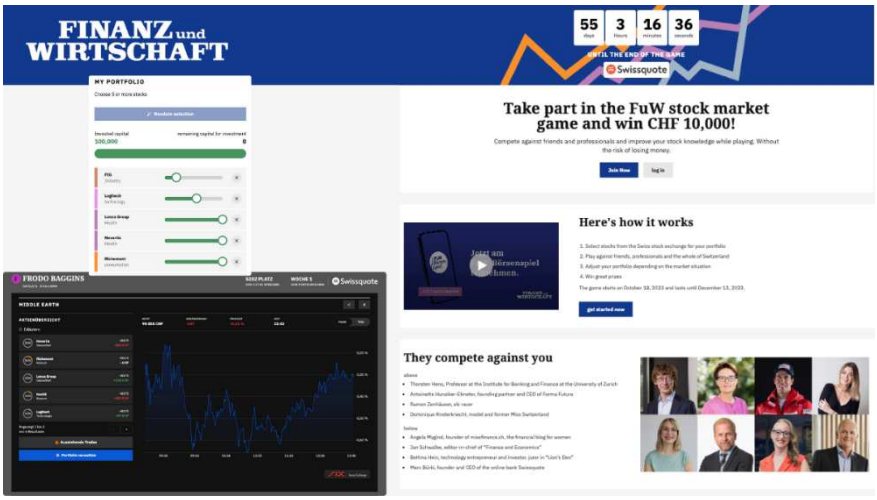


Figure 13: The layout of the game

9.6. Kauppalehti – Finland

After a first successful game, Finland's business newspaper Kauppalehti launched its second game this autumn and offered players the possibility to invest into US stocks as well, making the investment game even more appealing for Finnish investors.

Another feature worth highlighting are badges, which are an efficient way to recognize players' performance while maintaining a high motivation to return to the game. Users are able to unlock badges which also reward players with points. A badge for "beat the market" implies that the player has outperformed the average return of all stocks in the game over the past week, while the badge "Top 1%" stands for one of the player's portfolios ranking in the top 1% for the day. While some of the above listed newspapers also included badges, not all of them chose to do so.

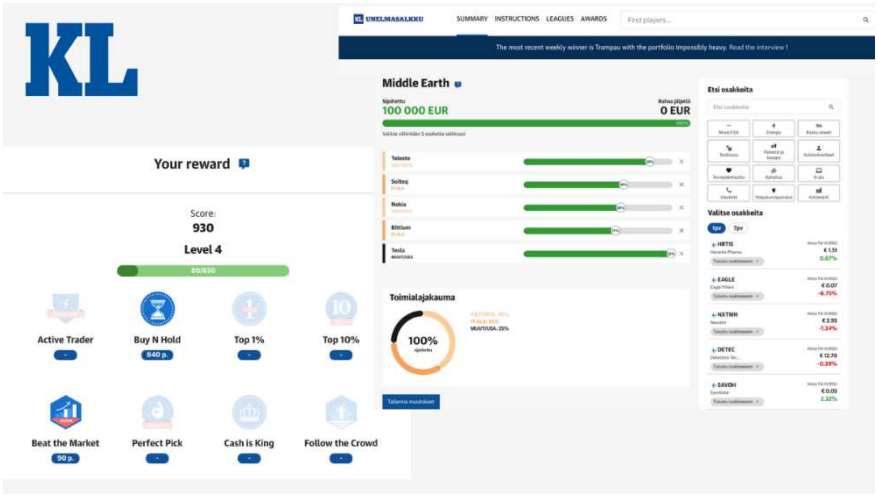


Figure 14: The layout of the game.

9.7. Summary

Gamification proves to be an efficient and innovative strategy for news publishers. As seen in the above examples, there are many ways to enhance reader engagement in a game and foster partnerships between brands, such as the collaboration between Dagens industri and Privat Affärer in Sweden.

Fantasy Funds specifically serves as a powerful tool for introducing new readers to the various facets of financial news and analysis. The game not only attracts a large audience but also retains them through competitive elements, driving user registration and subscriptions, while offering a unique and educational experience for readers.

10. Conclusion

Gamification, game-based learning, and game-based assessment have been burning topics for quite a while now. People are more productive, more engaged if they have fun. Therefore, it is important to include a gamified approach to the traditionally more serious activities. Many sectors have focused on their audience to employ their effective engagement through gamification principles. The common denominator is gamification of traditional approaches or discovering new gamified approaches that are at least as effective as traditional ones.

Gamification has its own rules that are necessary to follow to create a high-quality game. This review is a summary of topics and presents a useful tool and a solid foundation for further successful steps of the NEED project.

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