What Educational Escape Rooms can Learn from the World's Best Rooms

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Abstract: In the context of playful learning, escape games have the potential to enrich learning experiences through interactive problem-solving and narrative engagement. However, educational escape games differ significantly from the commercial offerings they reference in name and game mechanics. They often draw on the concepts of escape rooms that were popular a decade ago, relying primarily on traditional puzzle types such as code deciphering and number locks. Meanwhile, commercial escape rooms have evolved significantly over the past ten years, now offering highly immersive experiences based on captivating stories, convincing scenographic presentations, and well-thought-out tension arcs. Each year, enthusiasts vote for the top 100 escape rooms in the world. To investigate which best practices from these rooms can be applied to educational games, my master's thesis, which forms the basis of this paper (Neubig 2024) analyzed 38 of these award-winning games in detail. This analysis covered the gameplay, puzzle typology, room design and player guidance, as well as interactions with the game masters. Significant patterns were identified in all these areas that can be utilized in the design of educational games. Simultaneously, it reveals the types of challenges that the world's best games almost entirely avoid, despite their popularity in educational games. The study provides detailed insights into the diversity of puzzle types used, their variations throughout the game, and identifies particularly effective puzzle combinations. Escape games as a method of knowledge transfer have been adopted worldwide in schools, universities, museums, and libraries. They are used in various ways, such as recruitment tools, as orientation aids for institutional services, or to promote specific or generic knowledge and skills (Veldekamp et al. 2020). This work emphasizes the necessity to adapt educational games to the latest developments in the escape game industry if they are to be classified within this genre. In doing so, they can fully leverage the potential of escape games to create an engaging and motivating gaming experience.

Keywords: NextGen Educational Escape Rooms, Game-based learning, Puzzle Types and Factors, Spatial Elements and Effects

1. Introduction and Background

Escape rooms are now a popular leisure activity available in practically every city: you book a slot with a provider and then try to escape the room within about an hour by solving tasks. Nowadays, the versatility of the genre is hinted at by the broader term "games," although for recognition purposes, the original term "escape" has been retained, despite most games no longer involving an escape scenario.

An escape game is an interactive game in the real or virtual world where a group solves various puzzles and challenges, experiencing a scenario with a clear objective.

The group solves puzzles, combines clues, or completes tasks. For planning reasons, the game is often time-limited, but time pressure is not an essential component. No preparation or prior knowledge is needed, but participants are supported with hints if they get stuck. Players are guided by a game master who explains the rules and assists with any uncertainties during the game. To motivate players, it is crucial to present a clearly defined goal from the start. This goal may organically change during the mission but serves as a starting and orientation point for those embarking on a new mission.

Commercial escape rooms have significantly evolved over the past ten years, now offering highly immersive experiences with captivating stories, convincing scenographic presentations, and well-thought-out tension arcs.

Since 2018, the best escape games have been awarded annually in the "Top Escape Rooms Project Enthusiasts' Choice Awards" (TERPECA). Only enthusiasts—those who have played at least 200 escape games—are allowed to nominate games. Individuals with over 100 verified games can then rate the nominated games. In 2023, 1,114 enthusiasts with a total of 314,782 played rooms participated in this evaluation, providing a representative overview of the most popular rooms worldwide. It is worth noting that the rated rooms are still predominantly located in Europe, Australia, and the USA/Canada, despite escape games being a global phenomenon.

This paper investigates the best practices from commercial escape rooms to improve the design of educational escape games.

2. Research Design

In analyzing 38 rooms that have won TERPECA awards over the past three years, I identified both similarities and differences. The rooms were anonymized for the thesis as content confidentiality is crucial in the escape room community. These rooms qualified as exemplary through their ranking positions.

The following aspects from game theory were closely examined in the analysis:

Gameplay:

- Player reception and game conclusion
- Dramaturgy and associated intensity curve
- Presence and use of a feedback system
- Hint delivery and interaction between game masters and players

Room-Related Elements:

- Game path guidance
- Number of rooms
- Use of effects
- Physical challenges for players due to structural features
- Special spatial situations (e.g., darkness, isolation)
- Measures to enhance immersion

Story Design:

- Narration
- Act structures in the experienced story
- Existing roles for players or game masters

Puzzle Factors:

- Number of intermediate steps (Micro loops)
- Types of puzzles used
- Preferred combinations of puzzle types
- Puzzle sequence progression
- Use of meta-puzzles

The content spectrum of the games ranges from fairy tales to horror experiences in abandoned factories. They vary greatly in game duration and character interaction but are characterized by attention to detail and skillful use of audiovisual effects. TERPECA rooms also set new standards in narrative, confronting players with complex stories and not necessarily offering a happy ending even if the game is completed on time.

3. Findings

3.1 Gameplay Structure

Typically, players are greeted, informed about their mission (macro mechanic), and then solve a series of smaller challenges (micro mechanics) to ultimately complete the mission. They are then received outside the scenario and, after a brief closing conversation, returned to reality. This pattern is also evident in the 38 analyzed games, differing only in minor details.

3.1.1 Greeting

Players are welcomed by the game master, who introduces them to the game world and explains the rules. They receive all important facts, the scenario, and their roles in advance and are welcomed as part of the scenario. Safety instructions are given in a way that does not break the illusion. Only 24% of the analyzed games had a non-integrated greeting by the game masters. Winning rooms distinguish themselves by giving more importance to immersive introductions, with 76% welcoming players as part of the game and 53% additionally using an embedded audio or video message to introduce the game.

3.1.2 Micro Mechanics in the Game

Upon entering the game, players encounter an insurmountable obstacle referred to by Erol Elumir as a "gate" (Elumir 2019). These barriers are often locked doors or boxes. Players look for clues that are ideally visibly connected to the gate, combine them, and solve the puzzle as a team to overcome the gate. This leads them to new clues, game items, or rooms needed to overcome the next gate. The three steps of micro mechanics can also be divided into Discover/Infer/Act, as Jon Ingold suggests in his analysis of narrative-heavy detective games (Ingold 2022). Like video games, players usually remain in this loop until they successfully complete the task (Bauer 2018). This micro loop typically lasts between 4 to 8 minutes. All analyzed games applied the described micro mechanics. The number of micro loops (which equal puzzle intermediate steps) varied significantly, averaging 15 intermediate steps per 60 minutes of gameplay. Horror-themed games required fewer intermediate steps (six to ten per 60 minutes) compared to story-driven games.

3.1.3 Macro Mechanics of the Game

Players often receive an overarching quest with a predefined goal. In a 2015 survey of escape room operators, the most common answer was escaping from an unpleasant place and the second goal was scenarios with abstract tasks and no overarching narrative (Nicholson 2015). An analysis of over 450 scenarios in Switzerland revealed that games without a quest goal no longer exist. Escape scenarios still top the list (16%), closely followed by scenarios involving retrieving an object (15%), a scenario not mentioned in Nicholson's study.

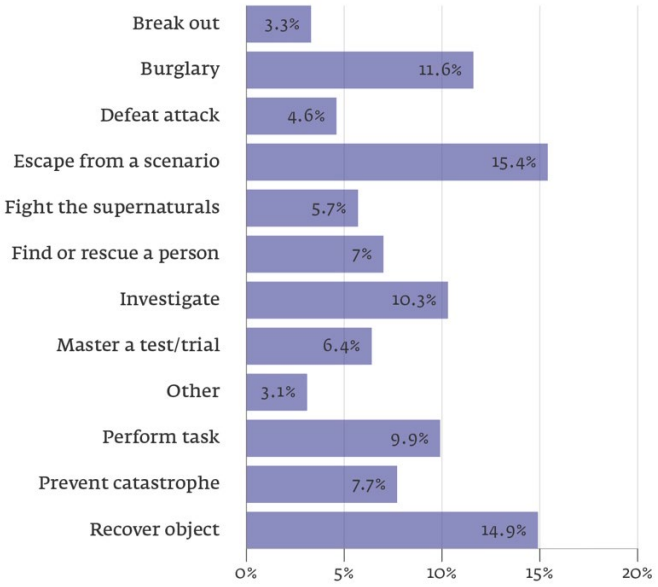

Figure 1: Scenario goals of 451 Swiss escape games

It should be noted that the analysis always refers to the apparent or communicated goal. In many of these rooms, the goal will change during the game. To achieve this overarching goal, players repeatedly perform the cycles of micro mechanics, which are connected by a narrative frame, until they approach the final goal. It is important that the group truly earns their success. It is possible that an escape game will not be solved before time runs out and will then end without a successful conclusion. This can have a negative impact on the narrative.

3.1.4 Transition to Reality

After completing the game scenario, players are usually (84%) greeted by the same person who welcomed them at the beginning. This person is no longer part of the game but serves as the host, congratulating players on their success or consoling them in case of failure, clarifying open questions, and reviewing the gameplay. In 95% of cases, team photos are taken as souvenirs.

3.1.5 Tension Levels

The analysis of the 38 games revealed recurring patterns in intensity and tension curves. Tension is often intense from the start, driven by players' expectations and possible fears about the upcoming game, which is further heightened by a driving atmosphere and narrative pressure. This allows for a quick and direct immersion into the

story, with players less likely to question the events and more focused on the mission. Even games that start calmly and "safely" often have a twist within the first few minutes that shifts the story in an unexpected direction. This method of unreliable narration helps involve players more quickly in the game.

Games typically provide moments of calm after nerve-wracking passages, allowing players to reorganize their thoughts. This mix of challenging moments and reward situations (Schäffer 2014) ensures that players do not rush through the game mindlessly but remain aware of the story and atmosphere. Another identified pattern is that the most challenging moment of the game occurs just before the end, giving players time to process the climax while still in the game before returning to reality. Players often describe room transitions as particularly exciting.

3.1.6 Difficulty Level

Compared to other commercial games, the puzzle difficulty of TERPECA rooms is relatively low. This is usually due to well-thought-out game design, where the group always knows what they are working on due to clear connections between clues and gates. Additionally, the puzzle components are well-tested and adjusted, resulting in little frustration for players and maintaining the flow. Few rooms on the TERPECA list boast a low success rate for groups.

All games begin with relatively simple puzzles to familiarize players with the designers' thinking, similar to a tutorial level in a computer game. After the easier introduction, the difficulty gradually increases, peaking just before the middle. At this point, players already know what the game expects of them and still have enough mental freshness to be intellectually challenged. The difficulty then decreases again, allowing players to feel capable until the end. Horror-themed games almost entirely avoid complex puzzles as players have less capacity for complex thinking while simultaneously fearing for their lives.

3.1.7 Feedback Systems

All rooms have their game masters integrated as hint providers within the game. In 89% of scenarios, the game master is part of the game and communicates within the game world. 76% welcome players in character and introduce the contact person for questions. Communication methods vary: classic walkie-talkies are used in only five games, while specially designed devices (45%) that assist with the quest are often provided. 66% of rooms have a direct feedback system for correctly performed actions, triggered by another action in the game or by visual or acoustic signals. This teaches players that correct solutions trigger confirmation. Hints can be provided in video, text, audio form, or by directing attention: a light or sound highlighting an area in the room can guide the group in the right direction.

3.2 Spatial Elements and Effects

In all analyzed games, players move through classic interior spaces, which vary greatly in floor area. Games over 100 m2 are notably large, often located in outer districts or industrial areas due to space requirements.

3.2.1 Rooms and Hidden Connection Doors

The number of rooms in the analyzed games ranges from five to ten rooms per hour of gameplay, with an average of six rooms. Smaller half-rooms, such as crawl spaces, are counted as half. 76% of rooms have 40% or more of their doors hidden, playing on the uncertainty of where the room continues. About 70% of analyzed rooms use intermediate floors and different height levels to further disorient players spatially.

3.2.2 Lighting

Light is used strategically to guide players through the room or to the right spot. Most games (82%) use dim lighting at least temporarily to create atmosphere. A third of the rooms have moments of complete darkness, challenging the sense of touch or patience until the light returns. Only safety instructions such as panic buttons, escape routes, and exit doors are marked with official signage.

3.2.3 Room Effects and Physical Challenges

37% of analyzed escape games use movable walls, floors, or ceilings, prioritizing player safety. In 63% of games, players must climb over obstacles, and 82% of rooms have passages requiring players to crawl. Seven rooms have situations where players can get wet, and 14 rooms have active hiding spots. In 13% of rooms, a previously

opened door no longer leads to the same room, and in 18% of scenarios, it is the same room but in a changed state. Sometimes running is appropriate (24%), but caution is advised as the floor is often uneven (34%). Another special feature is rooms that surprise players with a slide (16%).

These physical challenges mean that the games are hardly playable for people with significant physical limitations or wheelchair users. Only one game among the 38 seems to be fully accessible, with two more offering to omit certain challenging passages upon request. In a quarter of the crawl passages, only one person needs to be able to crawl through a narrow passage. Many providers inform about expected obstacles on their websites. Nonetheless, these special spatial elements that attract some players exclude certain groups.

3.2.4 Immersion and the Use of Sound and Effects

Sound effects and appropriate background music are used in all analyzed games to enhance immersion. Similarly widespread is the use of artificial fog (84%). Artificial weather situations such as wind, rain, or artificial snow are occasionally found in rooms, while around a quarter of games incorporate larger water sources. Half of the games (50%) use scents or build their sets with materials that naturally smell appropriate. 37% use pyrotechnic effects to make the scenario more realistic. In six scenarios, room temperature is deliberately changed to make the experience more authentic.

It may be tempting to reduce the room to only the necessary items to be used. However, this is at the expense of immersion and the joy of discovery. The analyzed TERPECA rooms have shown that this reduction is not useful. On the contrary, the desired action can only be performed if the room design presents it as clearly as possible: "a hide-and-seek game needs hiding places, and an adventure game needs an environment worth discovering" (Götz 2018). As long as player guidance is clear and unambiguous, the game can be both dense and atmospheric without losing orientation.

3.3 Storytelling

Escape games follow traditional narrative structures but the game's actions are only narratively significant if they can be attributed to human motives and it is clear who initiated the action and who benefits from it (Götz 2023). Players should identify with both the story and the mission. The narrative should not be obvious and predictable from the start. Games are often narratively intriguing when players gradually piece together the story from found clues and information snippets (Suter 2021). This structure, where players must assemble what exactly happened over time, is used in over half the games. Moreover, a story thrives on moments of challenge, subsequent reward, and periods of calm.

3.3.1 Roles of Players and Game Masters

In 76% of the analyzed games, the group is welcomed in a fitting role, often that of the mission giver. This way, players learn what is expected of them during the adventure as part of the game. In about half the games, the game masters were present as actors to give small tasks or hints or represented the antagonist. 53% of rooms used costumes, with every fifth room also dressing up the players. Moreover, over two-thirds of players receive mission-related items like scanners, occult devices, or communication tools such as phones or walkie-talkies.

In 61% of cases, players are engaged as experts for the upcoming mission. The game master grants them basic competence in the problem to be solved. When the assigned role requires significant expertise (e.g., trained ghost hunters or FBI agents), it is made clear from the start that it is an exceptional situation requiring special problem-solving. This prevents the group from being overwhelmed. Sometimes, the group is simply at the right place at the right time, such as when they unexpectedly find themselves in a situation instead of an expected job interview.

3.4 Puzzle Factors

In the detailed examination of the 38 games, over 1,500 individual puzzles divided into 718 puzzle intermediate steps (micro loops) were analyzed. These were classified into 19 different puzzle types. The analysis allows conclusions regarding the types of puzzles used, the most popular combinations, and the number of puzzle intermediate steps in relation to game time.

3.4.1 Classification into 19 Puzzle Types

The preliminary analysis of 50 escape rooms identified 19 different puzzle types. The subsequent detailed analysis of the 38 TERPECA rooms showed their frequency during a game and the different combination types used. All occurring puzzles can be fully classified into these 19 types.

Examining the puzzle types reveals differences in terms of combinability of multiple puzzle types, story potential, frustration potential, required teamwork, contribution to tension, necessity of communication, and whether the puzzles are physically or mentally demanding. Depending on what a puzzle aims to achieve, different types may be more suitable.

- **Assembling**: Putting together several components to form a whole.
- **Assigning**: Recognizing patterns or connections and abstracting this knowledge to find the solution.
- **Counting**: Counting elements in the room that have a specific feature.
- **Decoding**: Applying a key and method to decode a message to obtain a solution. The work of decoding is usually elaborate and time-consuming.
- **Dexterity Exercise**: Performing a task that requires precision and control over a longer period.
- **Finding Features in the Room**: Recognizing or finding deviations or features in the room that might be significant for a puzzle. Through this, players learn to decide which aspects are relevant.
- **Finding Objects**: Searching for and finding hidden objects or information in the game area.
- **Following Instructions**: Players follow a step-by-step guide.
- **Identifying Anomalies**: Players become aware of elements that deviate from a norm.
- **Logical Puzzles**: Solving a logic puzzle through deductive reasoning.
- **Mathematical Puzzles**: Solving a challenge that requires mathematical thinking and numerical understanding.
- **Memorizing**: Memorizing sequences or information.
- **Narrative Elements**: Players consume and interpret parts of the story based on puzzle components, often in the form of documents, audio files, and videos. These can include relevant parts for progression or aspects of the backstory.
- **Ordering**: Arranging a set of objects in a specific, intended order.
- **Performing a Task**: Completing a clearly defined task that requires no further interpretation.
- **Physical Challenges**: Completing physical challenges to overcome an obstacle and reach the solution.
- **Role-Playing**: Players interact in their role, for example, in dealing with an acting person.
- **Separated Communication**: Players are spatially separated and have access to parts of the necessary information, which they must describe to the other person as clearly as possible.
- **Using Senses**: Players need to touch, smell, taste, or listen closely to solve the task.

Designing a good puzzle involves many challenges. Players must first understand that it is a task for them to solve. According to Breda, Cable, and Laurutis, most locks they encountered require two pieces of information: the numbers to use as the code and their sequence (Breda/Cable/Laurutis 2022). Closer inspection shows that designers need to provide additional information, even if self-explanatory or intuitively grasped.

- What is the players' current goal?
- Is this lock part of that goal/puzzle?
- How do players recognize what are clues in the game?
- Do these clues and this specific lock belong together?
- Do players know when they have all the clues needed to solve the puzzle?
- What must they do to arrive at the correct answer (the numbers)?
- How do they input their solution into the lock (sequence and additional steps like pressing certain buttons on a digital lock)?
- What are the consequences of entering an incorrect solution?
- Do they recognize when they have solved the puzzle correctly?

Geers also emphasizes in his talk on high-quality escape games: "Time should be spent solving the puzzle – not finding out what the puzzle is" (Geers 2019). Mark Brown goes even further, stating that players should clearly know what they need to achieve in a puzzle game: "The player shouldn’t be figuring out what to do - just how to do it" (Brown 2018). Many designers initially approach this skeptically, fearing it would hand-hold players through the experience. However, the point is to encourage players to actively engage and motivate solution-oriented thinking by finding the path to the solution.

3.4.2 Frequency of Puzzle Types

The analysis of over 1,500 individual puzzle types showed "Performing a Task" (16%) as the most common type, followed by finding objects (15%) and recognizing features in the room (14%). These three types combine well with others, leading the list of puzzle combinations involving two or three types. Noticeably, many puzzle types favored in educational contexts are rarely or never used in award-winning rooms. The puzzle type "Decoding" (cryptography) appears only once, while mathematical puzzles (math puzzles) make up just 1% (Nicholson/Cable 2021). Popular museum game puzzles like "Counting" (0.3%) and "Ordering" (0.6%), and the often-used "Memorizing" (1%) in learning games play a marginal role. Here, educational games can evolve: the high quality of puzzles in escape games offers immense possibilities for modern, entertaining educational games.

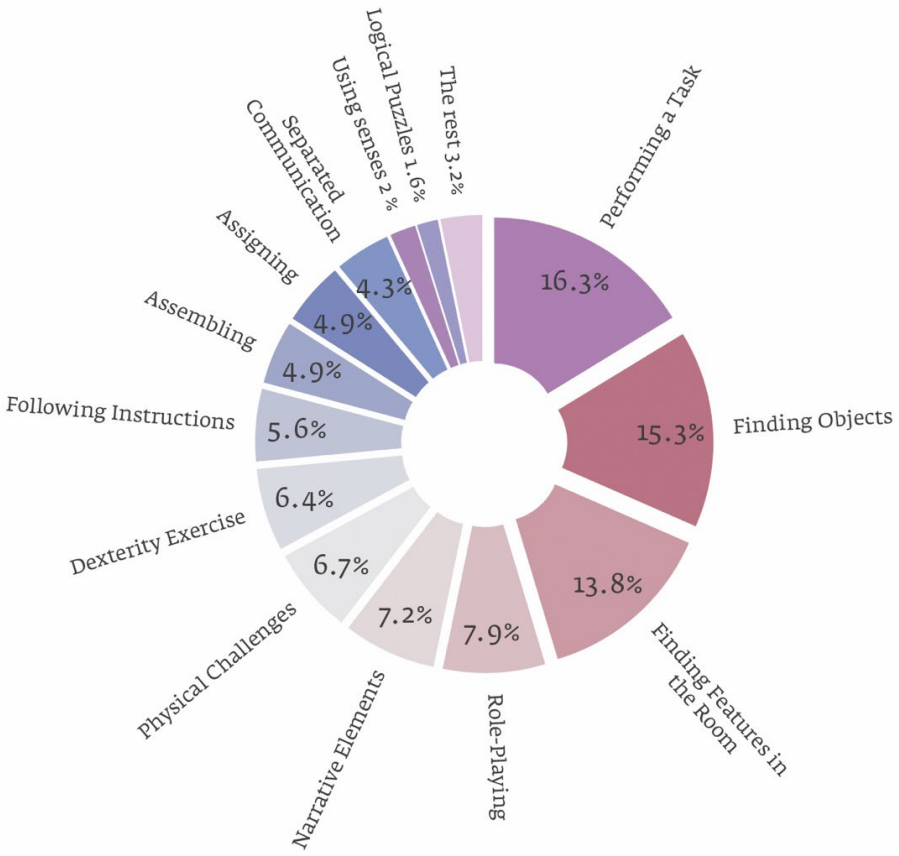

Figure 2: Distribution of puzzle types in 38 TERPECA escape games

3.4.3 Puzzle Intermediate Steps

Micro loops in an escape game are always a series of interconnected puzzle types that players must solve to progress. In 26% of cases, an intermediate step consists of only one puzzle type. Popular choices for these are role-playing (22%), dexterity exercises (15%), performing a task (15%), finding objects (14%), and physical challenges (14%). These tasks often require full concentration or can involve multiple people simultaneously.

40% of puzzle intermediate steps consist of a combination of two types, 27% from three types, and only 6% from four different puzzle types. The most common puzzle combinations include "recognizing features in the room," "finding objects," and "performing a task," leading both the two-type and three-type combinations.

"Finding features in the room," "Finding objects," and "Performing a task" lead both the two-type and three-type combinations. The 40 most common puzzle combinations are also those that have appeared at least four times.

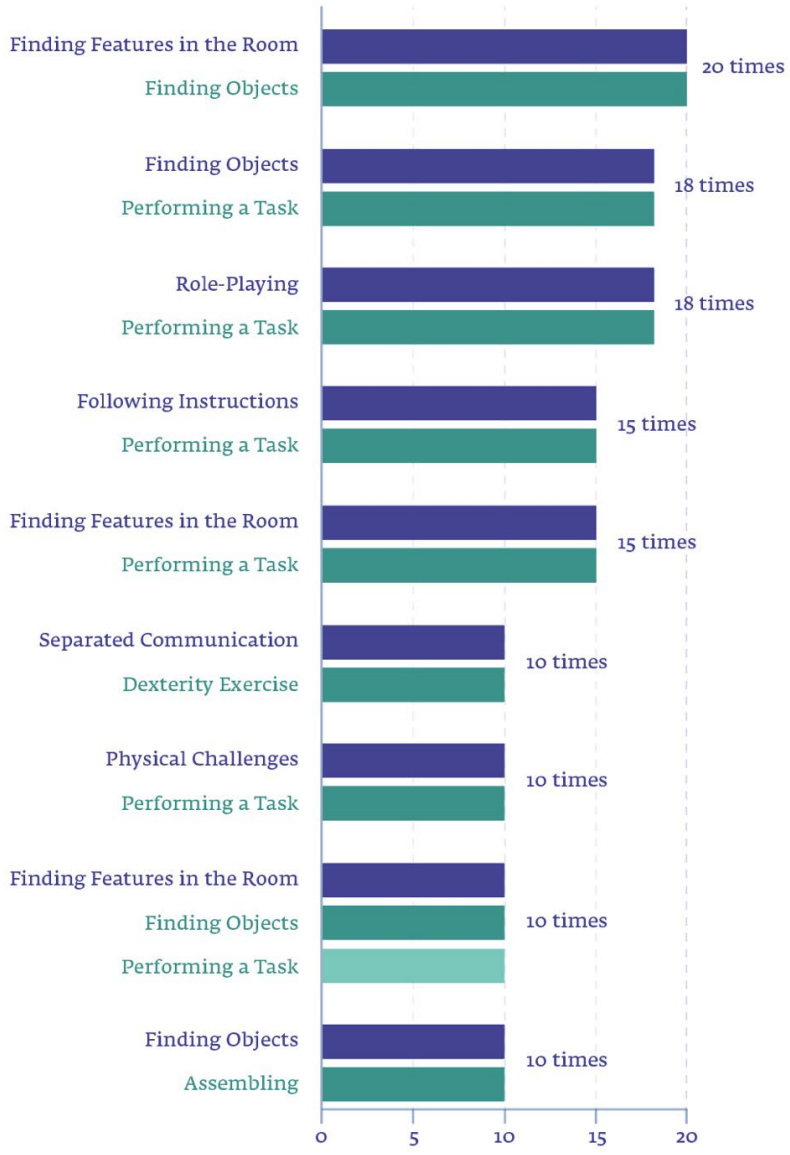

Figure 3: The most common puzzle combinations

It is crucial to ensure that a puzzle has only one solution, guiding players to the predetermined outcome and the intended path. Playtesting and observing test subjects often reveal unexpected solutions not anticipated by the designers. Consistent puzzle design within the established game world and learned mechanics is essential. Designers must see themselves as supporters of the players, with the primary goal of creating a coherent and fulfilling gaming experience.

The development of a learning game is a balancing act. Many new designers tend to want to pack too much content into a game (Boller/Kapp 2017). This often comes at the expense of fun and leads to overly complex processes.

For learning games, two puzzle types should be highlighted. Separated communication fosters team cohesion and is easily implemented in educational settings by ensuring not all participants see all information simultaneously. Logical puzzles, although infrequent in the analyzed rooms, are highly valuable for knowledge transfer, promoting deep content engagement through deductive reasoning.

3.4.4 Which Puzzle Type Suits Which Learning Content?

In 1956, Benjamin Bloom published a framework for categorizing educational goals, which was revised in 2001. According to Fotaris and Mastoras, educational escape games can cover all six categories of cognitive processes

in Bloom's taxonomy. Puzzles can be designed for players to understand concepts, apply knowledge, analyze information, evaluate solutions, and create new ideas (Fotaris/Mastoras 2021).

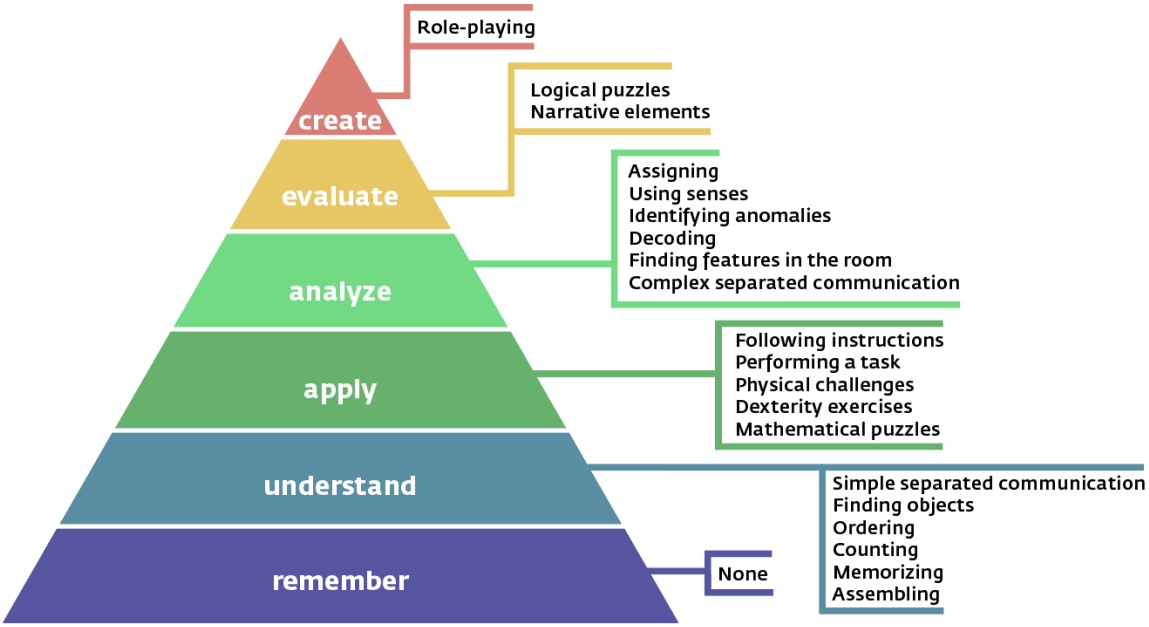

Figure 4: Ordering of puzzle types in the revised Bloom's taxonomy according to Krathwohl

(Adapted from Vanderbilt University Center for Teaching, 2022)

This also applies to the 19 puzzle types. Due to their diversity, they can be assigned to the individual steps of Bloom's taxonomy.

Remember Players recall facts and information from outside the game to solve puzzles. This aspect of recalling factual knowledge is only present if the educational game requires prior knowledge not found within the game itself, which goes against the principle of classical escape games.

Understand Players restate ideas and concepts in their own words, identify and describe problems. They understand the game mechanics, recognize clues, and as a group comprehend which points in the game are relevant for progress.

Apply Players apply their newly acquired knowledge to a context and begin solving problems (puzzles). Tasks are performed, and information is linked.

Analyze Players relate information to each other or break it down into parts to find causes. They experiment, combine objects and knowledge, question, and test them.

Evaluate Players evaluate information, weigh it by importance, and develop new approaches.

Create This point is only reflected in one puzzle type: role-playing. In this puzzle type, players make decisions, develop stories, and adapt knowledge to future situations, which promotes high self-responsibility.

The Swiss curriculum divides learning competencies into knowledge, skills, and will. Knowledge includes understanding what students need to solve a task, skills include the ability to apply this knowledge, and will includes the willingness to acquire and use the first two. That corresponds also to Bloom's taxonomy and the principles of escape games: acquiring knowledge, applying it, and being motivated to use it.

4. Conclusion

It is challenging to adapt an educational game to match the level of a commercial offering. But by following a few principles, it is possible to improve the quality of the game: Designers must consider from the start how the game ties together with a story, how to incorporate various puzzle types, and how the interaction with the game master will look. Many spectacular effects in commercial rooms can be adapted using simple tools like remote-controlled lights and music. Additionally, designers must plan how to integrate direct confirmation of correctly solved

puzzles without relying solely on frequently used number locks. The knowledge content should not be too complex, but the puzzle mechanics must fit the content.

Escape games offer great potential for all forms of educational institutions. This study has shown that it is worthwhile to take an extra step and expand these games into immersive experiences. While this requires significant effort from designers, only then do the games reach their full potential. On the developers' side, this means being willing to perform tasks during the game that sophisticated technology would handle in commercial games. However, with the targeted use of light, sound, and well-designed props, it is possible for an individual or small team to create an immersive experience, whether in a museum or a classroom.

References

Bauer, R. (2018). Games as a Special Zone. Games and Rules. Game Mechanics for the «Magic Circle». Motivation Mechanics of Games, 35–46. transcript Verlag, Bielefeld.

Boller, S. & Kapp, K. (2017). Play to Learn: Everything You Need to Know About Designing Effective Learning Games. Association for Talent Development

Breda, M. & Cable, L. & Laurutis, A. (2022). Educational and intercultural escape games: a methodology.

Brown, M. (2018, 14. März). Game Maker's Toolkit. What Makes a Good Puzzle? [Video]. YouTube. URL https://www.youtube.com/watch?v=zsjC6fa_YBg&ab_channel=GameMaker%27sToolkit (Retrieved on 2 May 2024)

Elumir, E. (2019, 27. August). How Escape Rooms Do Difficulty Wrong – The Player Loop. The Codex https://thecodex.ca/how-escape-rooms-do-difficulty-wrong-the-player-loop/ (Retrieved on 12 April 2024)

Fotaris, P. & Mastoras, T. (2022). Room2Educ8: A Framework for Creating Educational Escape Rooms Based on Design Thinking Principles. Education Sciences. 2022; 12(11):768.

Geers, G. (2019, 7 to 8 May) How to build a high quality escape rooms. [Conference presentation]. Up the Game 2019 - Where Fiction Meets Reality, Amsterdam, NL.

Götz, U. (2018) Rules Shape Spaces – Spaces Shape Rules. Games and Rules. Game Mechanics for the «Magic Circle», 259–265. transcript Verlag, Bielefeld.

Götz, U. (2023) Spaces of Possibility—Spaces of Purpose. Etcpress.

Ingold, J. (2022, 24 August). GDC. The Burden of Proof – Narrative Deduction Mechanics for Detective Games [Video]. YouTube. URL https://youtu.be/--3meejDM-U?si=IIOUzdOKzHMIfA76 (Retrieved on 12 April 2024)

Neubig, C. (2024). Unlocking knowledge: Was edukative Escape Rooms von den weltbesten Räumen lernen können. [Master's thesis, Zürcher Hochschule der Künste]. Zürich

Nicholson, S. (2015). Peeking behind the locked door: A survey of escape room facilities. White Paper available at http://scottnicholson.com/pubs/erfacwhite.pdf

Nicholson, S. & Cable, L. (2021) Unlocking the Potential of puzzle-based learning - Designing Escape Rooms + Games for the Classroom. Corwin SAGE Publications Ldt.

Suter, B. (2021). Narrative Patterns in Video Games - Narrative Mechanics and Its Rules and Rule Sets. Narrative Mechanics. Strategies and Meanings in Games and Real Life, 51–78. transcript Verlag, Bielefeld.

Schäffer, L. (2014). Dramaturgie in der Ausstellung. Bielefeld: transcript 2014. (Schäffer, 2014)

Vanderbilt University Center for Teaching (2022). Bloom's Revised Taxonomy, cft.vanderbilt.edu, https://www.flickr.com/photos/vandycft/29428436431 (Retrieved on 25 July 2024)

Veldkamp, A.& van de Grint, L.& Knippels, M.-C. P. J.& van Joolingen, W. R. (2020). Escape Education: A Systematic Review on Escape Rooms in Education. Educational Research Review, 2020, 31, 100364.