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The State of Escape: Escape Room Design and Facilities

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Abstract: Escape rooms are live-action team-based games where players discover clues, solve puzzles, and accomplish tasks in one or more rooms in order to accomplish a specific goal (usually escaping from the room) in a limited amount of time. This paper presents the results from a survey answered by 175 escape room facilities from around the world about their facilities. The paper highlights different themes, demographics of players, room features, and other design patterns popular in escape rooms during 2015. Given the rapid growth and evolution of escape rooms, this paper serves to document the current state of this phenomenon.¹

Keywords – game design, escape rooms, live action games, experience design

Introduction

“You have one hour to find the clues, solve the puzzles, and locate the key that will unlock this door. Good luck!”

Escape rooms are live-action team-based games where players discover clues, solve puzzles, and accomplish tasks in one or more rooms in order to accomplish a specific goal (usually escaping from the room) in a limited amount of time. Escape rooms require teamwork, communication, and delegation as well as critical thinking, attention to detail, and lateral thinking. They are accessible to a wide age range of players and do not favor any gender; in fact, the most successful teams are those that are made up of players with a variety of experiences, skills, background knowledge, and physical abilities.

The purpose of this paper is to explore the current state of the escape room industry through a large-scale survey. Because the contents of escape rooms are, by nature, kept a secret and it is a highly competitive marketplace, there are not resources publicly available to help those wanting to start or improve an escape room. A survey that combines responses from many different escape rooms is the first step in creating a public record about escape room facilities in a way that does not infringe upon the secrecy desired by the designers and proprietors of escape rooms.

Demographics of Survey Respondents

¹ Note: This paper is a revised portion of the open source white paper: Nicholson, S. (2015). *Peeking behind the locked door: A survey of escape room facilities*.

The primary method of contacting escape room facilities in 2015 was either through e-mail address or Web-based contact forms. The *Escape Room Directory* (<http://escaperoomdirectory.com/>) was the starting point, and then web searching and other directories were used to locate other facilities. Out of 404 facilities contacted with the unsolicited request for the survey, 175 (43%) eventually filled out at least some of the survey. This survey was presented in several stages; responders were told that they could quit the survey at any time, so the number of people who answered any specific question may be different than the number of people who started filling out survey. The first stage of the survey contained questions about the escape room facilities, and 175 facilities participated in this survey; those that wished to be recognized are listed in an online white paper (Nicholson, 2015). The second stage of the survey, which was repeatable up to 5 times, asked respondents to discuss a specific escape room; 124 different facilities described 224 different escape rooms. After the primary survey was closed, several other questions emerged from discussions with survey participants, so a follow-up survey was sent to survey participants; 61 participants participated in the follow-up survey. Table 1 shows the breakdown of participants by continent.

In what continent are you located?	Count	Percentage
Asia	18	10%
Australia	10	6%
Europe	91	52%
Multiple	5	3%
North America	44	25%
South America	1	1%
(blank)	6	3%
Grand Total	175	100%

Table 1: Survey participants by continent

This breakdown demonstrates the English-language bias in this survey. There are thousands of escape rooms in China and Japan, but most of the responses from Asia are from Singapore or Malaysia. In fact, throughout the survey, when the results refer to Asia, they are referring primarily to Singapore and Malaysia. I expect that since my request for the survey response was in English and was using an English-language survey instrument, the language barrier prohibited getting a response from the Chinese and Japanese facilities that were contacted. This represents a bias in the sampling method, and therefore, a bias in the results. The “Multiple” responses are from franchises that listed locations that were from different areas.

Demographics of Players

Proprietors were asked about the demographic breakdown of the primary features of their player groups. About 37% of groups are groups of players over 21, about 14% of players are families with parents and children, while 19% are groups of players under 21. Corporate clients make up about 19% of the customers for escape rooms, and 11% of groups are couples out on a date. That said, in Asia, Escape Rooms are more likely to attract groups of only younger players than

groups of adults.



Figure 1: Primary classification of Escape Room player groups

There is considerable discussion about genders and games. Unlike some forms of gaming, escape rooms draw in players of both genders relatively equally. About 70% of the groups that play through rooms are of mixed genders, and the remaining groups are equally split between all male and all female. In Asia and Australia, however, gender balance is even more the case, with 85% of all groups being of mixed genders. Throughout this study, questions about gender continued to return the result of a relatively equal balance of male and female players.

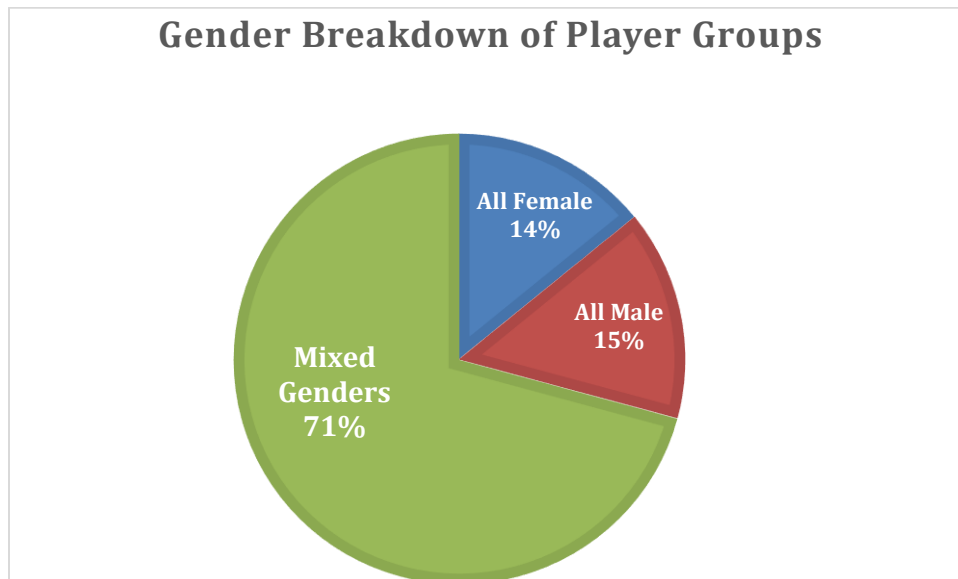


Figure 2: Gender Breakdown of Player Groups

Descriptions of Facilities

About 24% of the Escape Room facilities offer one single game, another 27% offer two different games, and 18% offer three different games. The remaining 31% of facilities offer more than three games. The facilities in Asia are more likely to have more games, with 66% of escape room facilities in Asia offering 4-6 different games.

Some Escape rooms are in interesting locations, such as a

- Barn with a western town look (Escape Maze, Peterboro, Ontario),
- Former military complex (Room Escape Amsterdam),
- Old neglected building (Breakroom, Vilnius, Lithuania),
- An old stock exchange building (Sherlocked Mystery Experiences, Amsterdam), and
- An Escape Igloo at a ski resort (Enigmarium Escape Room, Ljubljana, Slovenia, 2015).

Escape Room Competition, Costs, and Team Size

Escape rooms are a competitive market. Some proprietors who were first into a small market complain about a rush of other rooms opening up in the same small market, charging lower prices and hurting business. Numerous accusations have arisen of one company stealing the puzzles and gameplay from another room. In Asia, where escape rooms have been established the longest, half of those surveyed believe the market for escape rooms is oversaturated. In Europe, half of those surveyed believe there are an appropriate number of escape rooms. North & South America has the highest number of proprietors who say they are they are only escape room in the area. This is certain to change within a few years.

Escape Room Costs

As Escape rooms are a new and competitive market, many customers don't have an expectation as to how much a room should cost. The two most common models are charging per player (55%) or charging per team (39%). There are also hybrid models, where there is a base cost for the room plus an additional fee per player or banded models where, for example, there is one price for 2-4 players and another price for 5-8 players. In addition, because it is a new market and many proprietors have opened Escape Rooms in a market without being aware of other models, price structures vary. After the first escape room opens in an area, it sets a model which many follow for that market. This can be seen in the table below; all of the Asian facilities that responded charge per person, while in Europe, it is more common to charge per team.

Do you charge per person or per team for an experience?	Asia	Australia	Europe	North & South America	Overall
Per Team	0%	29%	63%	12%	39%
Per Person	100%	71%	29%	85%	55%
Other	0%	0%	8%	3%	5%

Table 2. Methods of charging for escape rooms.

Escape Room Team Size

To be able to compare the rates by team and by player, it is important to know the team size and how teams are put together. In about 60% of the escape rooms, each group of players is in their own room; of these facilities, about two-thirds of these facilities charge by the player and one-third charge by the team. In the other 40% of escape rooms, players are charged individually, and small groups of players may be put together in the same room. The average team size overall is 4.58 people. Teams in Europe are the smallest, with an average of 3.98, while teams in North & South America are the largest, with an average of 6.07.

These models create very different player experiences: when players are in a room with only people that they already know, they will be more comfortable and are more likely to be effective as a team. If players are put into a room with strangers, there will be a period of time as players have to learn to engage with each other. This challenge is made more difficult in countries where there are different languages commonly spoken or in a high-tourist area; if members of a team are not able to communicate well, it can create a frustrating experience.

Players in Asia and Europe are much less likely to be put into rooms with strangers; only about 20% of responding facilities from these continents put small groups of players together on a team. In North America, it is a much more common practice – about 60% of responding facilities place small groups of people together. This may be because of the language issues or because of cultural issues of how accepting players would be of playing a game with strangers; from a capacity standpoint, it makes sense to put multiple groups into the same room, but from a

player experience standpoint, this might drive people away if this is not something that would be acceptable by people in the local culture.

But What's Behind the Door?

The mystery of what is behind the entry door in an escape room creates incredible tension and giddiness in players. When waiting for their game, the tension in the air is high; people are nervous and quiet, as they don't know what to expect. Once in the room, teams start slow, figuring out their surroundings, but before long a burst of excitement takes over and the team members are running from place to place, calling out discoveries, and hunched over puzzles in small groups. As they leave the game, the excitement level is high, and many rooms allow for time for the players to talk to the staff about their experience before taking a photo of the team. The discussion of the shared experience continues long after leaving the facility; in the live-action role-playing community, this shared discussion of an activity is known as froth, and is what a good escape room creator seeks to generate (Howitt, 2012).

In the survey, escape room proprietors described between one and five games from their facility. One hundred and twenty four facilities described a total of 224 rooms, with most participants describing one or two rooms (and a hearty thanks to the 10 facilities that described either 4 or 5 different rooms!)

Game Themes and Narratives

For purposes of this discussion, the terms “themes” and “narratives” will be used in specific ways. For the integration of theme and/or narrative, there are several levels:

- Escape rooms can be a collection of puzzles and tasks without a theme or a narrative.
- Escape rooms can have a theme, such as “Escape from the Haunted Basement” or “Deep Space Desertion”, where the decorations, audio track, and props in the room match up with the theme, but there is no overarching story. This would be akin to being on a movie set without a script; players can choose to add in their own story, but there isn't a narrative provided. The puzzles could stand independently outside of the room and do not rely upon the theme.
- Escape rooms can have a narrative and the players are placed into a role into the narrative through some type of a pre-game video or story presented by the game master. The goal may tie into this narrative, but the puzzles done throughout the room do not necessarily move the narrative can and can stand apart from the narrative.
- Finally, escape rooms can have a narrative, and craft the puzzles such that the puzzles are part of the storytelling and move the narrative along. The puzzles cannot be separated from the narrative, as they are part of the story.

It is important to note that none of these are the “right” design path. Some players of escape rooms are simply wanting to work on puzzles with friends in the physical world, so the narrative can get in the way. For some players, having a theme can add to the ambience and fun, but they

are not really wanting listen to a detailed backstory; they want to focus on puzzles and tasks. On the other hand, some players are seeking a strong narrative experience and want to have immersion; these players get frustrated when the puzzles or the game master takes them out of that narrative space. Different game styles are best for different player types. Designers need to consider their goal, work to meet that goal, and then ensure that the games are marketed and described in a way to help players choose the best room.

Facilities also reported about the theme of specific rooms; they could choose more than one from the list as the themes might overlap (see the table below). Horror themes are more popular in Asia, with 24% of the reported rooms having a Horror theme. The most popular theme in Europe is a specific time and place from the last century, while the rooms from Asia and the Americas are more likely to be set in the modern era.

	Overall
Modern Era (2000-2015)	25%
Specific place and time (1900-2000)	24%
Other	16%
Specific place and time (1700-1900)	13%
Horror	13%
Fantasy	12%
Science / Laboratory	12%
Abstract: There is no theme	10%
Future / Technological	7%
Military	7%
Toy Room	3%
Cartoon/Anime	1%
Steampunk	1%
Seasonal (Christmas, Halloween, Easter, etc.)	1%
School	0%

Table 3. Themes/Genres of escape rooms

After learning about themes, rooms were then asked to select the overarching concept. As can be expected in a survey of escape rooms, the most common concept was to escape a room, with 16% of the rooms having no other narrative other than “Escape the Room” and 30% of the rooms about escaping a specific place (which would bring a theme into the room). After this primary concept of “Escape something”, the concepts were widely scattered, and can be seen in the table below.

	Overall
Escape a Specific Unpleasant Place (Dungeon, Prison, Preschool, etc.)	30%
Abstract: There is no overarching narrative other than "Escape the Room"	16%

Investigate a Crime or Mystery	9%
Engage with the supernatural	8%
Solve the Murder	5%
Defuse the explosive device	5%
Be an Adventurer	4%
Gather Intelligence or Espionage	4%
Carry out a Heist	4%
Other	3%
Find the Missing Person	3%
Help Create Something (such as a cure, a potion, etc.)	2%
Military Operations	2%
Free another person or animal	2%
Survive!	1%
Carry out an Assassination	0%

Table 4. Concepts/Narratives for escape rooms

Many narrative paths listed above do not necessarily make sense with a story element of “you are trapped in a room and must escape.” This means that to fit the escape room name, the designer must add a layer onto the game of the players being trapped in some way and needing to escape. Facilities were asked in what percentage of the games were players actually needing to escape the room as part of the narrative. Overall, about 70% of escape room games require players to actually escape the room as part of the winning condition. This means that 30% of the games in escape room facilities aren’t actually about escaping rooms.

Puzzle Organization

Most rooms require players to search for clues and puzzles and then solve those puzzles. Some rooms also have tasks, which are activities where the players know what to do and have to succeed at the task (like a laser maze). There are different ways that puzzles can be organized. They can be presented individually, where each puzzle feeds directly into a large meta-puzzle or sequentially, where one puzzle must be solved to unlock what is needed to work on the next puzzle. Examples of these forms can be seen in the figure below, where the circles are puzzles and the rectangles are either meta-puzzles, locks, or other victory conditions for a stage of the escape room.

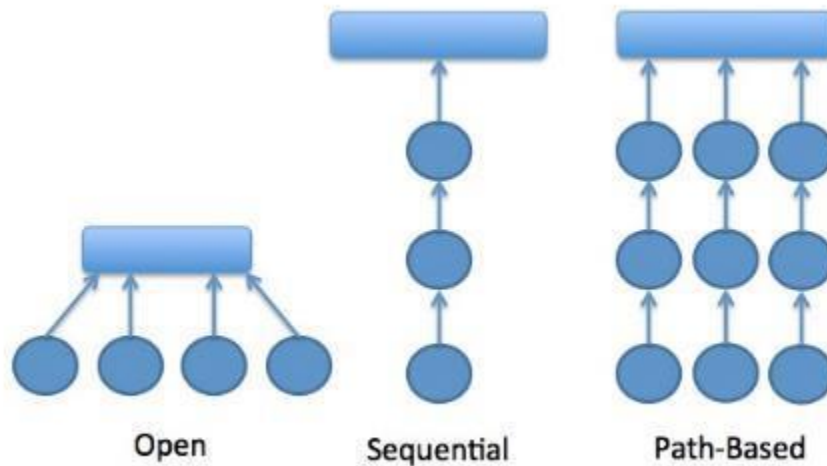


Figure 3: Basic Forms of Puzzle Organization

The most common method of organization (45% of the described games) is path-based, where a team is presented with several different paths of puzzles at the same time. Each path of puzzles is a sequence and leads to a final result. Each of these results is needed for a meta-puzzle, which will then unlock the next stage of the game or the victory condition. The advantage to this structure is that different members of a team can work on different puzzle paths at the same time, but by presenting a subset of puzzles, the designer can start with simpler puzzles and then move into more difficult puzzles as the players grow in confidence and familiarity.

The second most common method of organization (37% of the described games) is sequential, where the players are presented with one puzzle, the answer of which will unlock the next puzzle in the sequence, and the final puzzle allows players to win the game. This works better in smaller rooms or when puzzles require the entire team to work together in a series of linear tasks. This method of organization was more popular in described games from Asia (62% of games) than the path-based organization described above.

Much less common (13% of the described games) were open structures, where the players had the ability to take a large number of puzzles in the room at the same time. As they solved puzzles, they got pieces of the final solution. This is more difficult to use when creating a scaffolded, flow-based experience where the game gets more challenging as time goes on.

There are some facilities that use a hybrid model, where the team may start with a few puzzles presented in sequence, and then this opens up into a path-based model as the team gets into the flow of the room. It could also go the other way, where it starts with an open or path-based model, and then the puzzles become fewer but more challenging at the end of the room. Another hybrid model is a pyramid structure, shown in the figure below, which starts with multiple path-based puzzles, each of which feeds into a meta-puzzle that starts a sequence, which creates another path-based structure leading to a meta-meta puzzle.

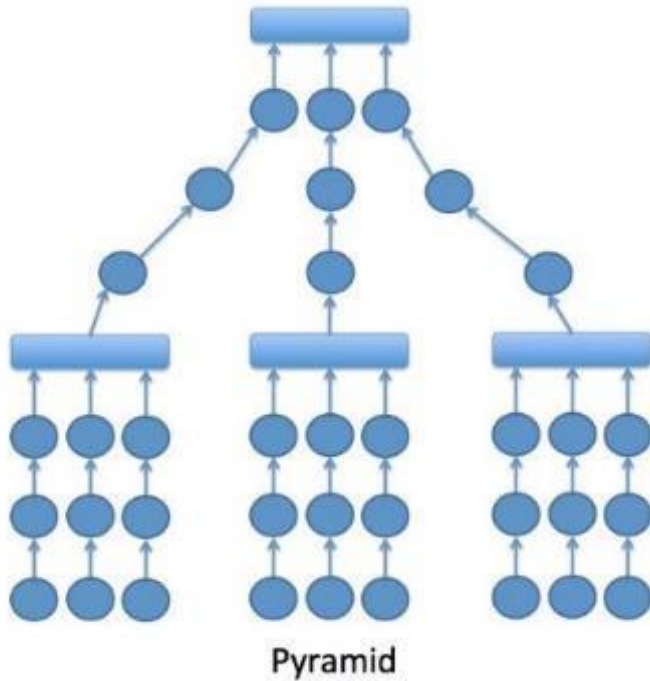


Figure 4: A Pyramid puzzle structure

The reality is that many puzzle rooms have much more complex structures. The figure below shows a map of puzzles and how they relate created by David Staffell and David Middleton for Bewilder Box Brighton, UK. Each star represents a starting point on a puzzle chain, and the connections show how results from multiple puzzles come together. This model is more realistic for how puzzles connect together in many rooms.

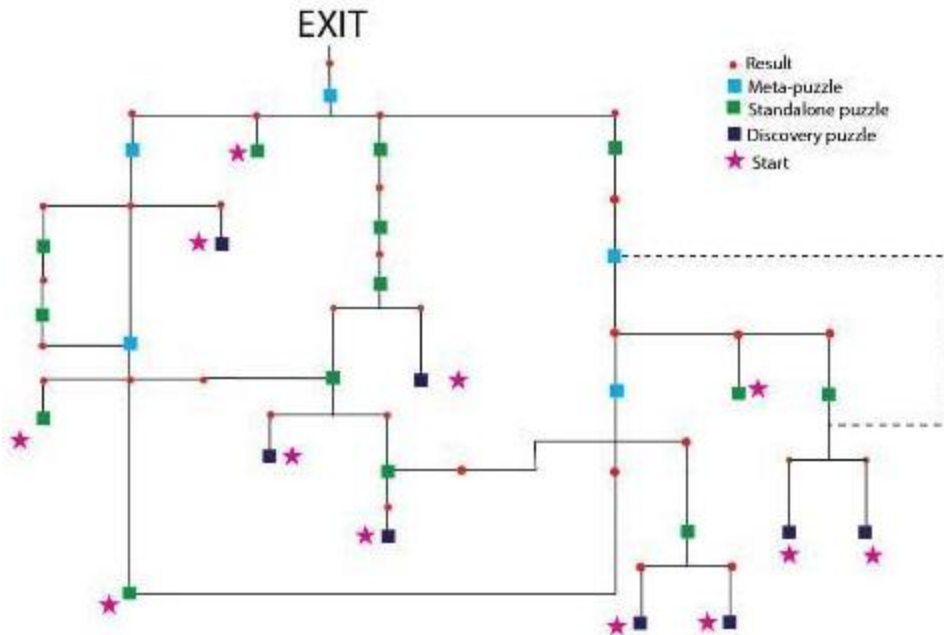


Figure 5: Complex puzzle structure used in Bewilder Box Brighton (<http://www.bewilderbox.co.uk>)

Puzzle Types

The next area of exploration is the specific types of puzzles in each room. This is the topic that was most sensitive for facility owners, as it is their goal to protect the content of the games. The table below lists many puzzle types, sorted by how many rooms were described that contained puzzles of that type.

Each continent had a type of puzzle that was noticeably more favored than it was in other areas. Asian escape rooms were more likely to have counting puzzles (62%), rooms from North & South America were more likely to have players assemble a physical puzzle than on other continents (58%), and rooms in Europe were more likely to have players search for objects in images (56%).

What puzzle types are in the room?	
Searching for physical objects hidden in the room	78%
Team Communication	58%
Light	54%
Counting	53%
Noticing something "obvious" in the room	49%
Symbol substitution with a Key (such as looking symbols up in a book)	47%
Using something in an unusual way (Out-of-the-box thinking)	47%
Searching for objects in images	43%
Assembly of a Physical object (such as a jigsaw puzzle)	40%
Algebra and other Mathematics	39%
Pattern identification (such as visualizing a shape in a set of dots)	38%
Riddles	37%
Ciphers without a Key (such as letter substitution)	35%
Hearing	26%
Mirrors	26%
Abstract logic (such as Sudoku)	22%
Research using information sources	20%
Strategic thinking (such as Chess)	20%
Hand-eye Coordination (such as shooting a target)	17%
Rope or chains (such as undoing complex knots)	16%
Traditional Word Puzzles (such as crosswords or word search)	14%
Mazes	14%

Physical Agility (such as a laser maze)	13%
Touch	12%
Knowledge of facts not provided in the room	11%
Shape manipulation (such as a matchstick puzzle)	11%
Liquids	9%
Social engagement with actors	7%
Physical engagement with actors	4%
Smell	3%
Taste	1%

Table 5. Types of Puzzles in escape rooms

Other Aspects of the Rooms

Non-Player Characters

About 10% of games that were described used an actor or actress in the room as a non-player character (NPC) to interact with the players. A few of the games (2%) used an NPC to provide the players with the backstory and goal for the game, but more games did this with a short video or piece of text. Other rooms (4% overall, but 14% of the rooms from North & South America) had an NPC in the room to help the players along. Another role for a NPC is to serve as an adversary and difficulty control for the teams (4% overall, but 8% of the rooms from North & South America). There is an escape room franchise – Room Escape Adventures – that is well-known for their *Trapped in a Room with a Zombie* game. In this game, there is an NPC made up like a zombie chained to the wall. Every five minutes, the chain grows longer, and if a player is touched by the zombie, that player can no longer move around the room (Bucket List Productions, 2015).

Computers in the Rooms

Instead of having a human non-player character, rooms may have a computer that the players interact with. This computer can be used in several ways. It can be used as the platform for a puzzle that the players must solve. It could also be used as a way to interact with the players, responding to commands and requests. This computer can either be a program that is designed ahead of time to respond to players' commands (like an interactive fiction or point-and-click adventure game) or the computer can connect to a gamemaster on the other side playing the role of the computer or someone the players are chatting with.

Having the computer does take away from the physical nature of the escape rooms. A computer creates a situation where one player will be sitting down in front of a screen, and that person will no longer be in the same mental space with the rest of the players. Overall, about 70% of described escape room games are completely physical activities. Games from Europe were less likely to be purely physical (58%) while games described from Asia were more likely to be pure physical experiences (86%). If there was a computer, most of the time it was used to facilitate puzzles for the player, but occasionally (5% overall, but 9% of games from Europe) it

would be used to create a virtual space where the players must enter as part of the challenge. Because European rooms are typically smaller than rooms in other areas, computers help them to add puzzles and layers that they can't do as easily in a physical space.

Different Physical Spaces

When referring to a single game, the term used is an “escape room” in the singular; however, the reality is that most escape rooms have multiple physical spaces that the players work through. For example, the players may start in a secretary’s room, which has another door leading to an office. Within that office may be a bookshelf that reveals another area. These physical spaces create different stages of the game, and the designer can use this technique to create an increasing flow of complexity in the game. The players start in one room with a few puzzles, and solving those puzzles allows them access into another space with more complex puzzles.

Only about 30% of escape rooms are a single physical space, although this is much higher for rooms in North & South America (48%). About 60% of escape rooms described have two or three different physical spaces. The number of rooms with more than that drops off quickly, although one room in Europe has nine different physical spaces the players move through!

Safety Concerns and Locked Doors

As escape rooms are a relatively recent phenomenon, there have as of yet not been any accidents reported that were made worse because the players were locked in a room. While most of the rooms are monitored by a gamemaster, during a fire or other disaster the gamemaster may not be able to get to the door to unlock it. When the facility is monitored by only a single staff member, if something were to happen to that person the players would not be able to get out of the room. This has caused some challenges for escape rooms getting insurance; in fact, one proprietor reports that they had to have their facility classified as a prison for insurance purposes.

As seen in the table below, in about 30% of the responding facilities, the players are actually locked into the room and have no way to let themselves out; this poses a significant safety concern. Some proprietors state that this is what the players signed up for – to be locked in a room – but if there is a single well-publicized incident, it would be bad for the escape room industry.

The most common solution, as seen in 37% of the facilities, is to provide the players with a way to exit the room in an emergency, such as a key for a mechanical door or a push button for a door lock powered by electricity (which would then unlock if the power went out). In another 22% of the rooms, the door is not actually locked, so players can leave if they need to; this percentage is higher for North & South America (36%) and much higher in Australia (67%). Another solution is to provide a secondary exit that the players can access. In all of these cases, the safety mechanism should be pointed out to the players with the caveat that if they use this mechanism to leave the room, they have lost the game.

Is the door actually locked? Can players leave the room without a staff member present?	Asia	Australia	Europe	North & South America	Grand Total
The door is not actually locked, so players	0%	67%	4%	36%	22%

can walk out at any time.					
There is a key or other mechanism that players can use to let themselves out of the room.	80%	0%	43%	29%	37%
There is another exit to the room that players could use if needed.	0%	33%	9%	14%	12%
They can not. A staff member must let players out of the room.	20%	0%	43%	21%	29%

Table 6. Actual status of the “locked door” in escape rooms.

The Role of the Gamemaster in Escaping the Room

Giving Hints

One element from live-action role-playing games that is commonly seen in escape rooms is a gamemaster. Like in a role-playing game, the gamemaster’s job is to ensure that the players have a fair experience, that the physical puzzles function as planned, and in most cases (82% of the time), provide help to the players when they are stuck or frustrated. This is either done through monitoring the players via video (76% of the time) and/or being in the room to engage directly with the players (16% of the time). The gamemaster also monitors the room to ensure the players do not damage to the room or need emergency assistance. Only 5% of the facilities reported that nobody is monitoring the room during the game.

Being a good gamemaster is a challenge akin to being a good teacher or corporate trainer. The best teachers allow students to engage with problems, explore, learn, and intervene only when it is needed to avoid students being overly frustrated. A good gamemaster needs to understand when players need a hint and when they need to be left alone to continue to work, as it is very frustrating for players to be on the cusp of a breakthrough and then to have that moment taken away by a poorly-timed hint.

The methods for distributing hints vary widely. In 23% of the facilities, players are not allowed to request hints; most of the time, this is because the gamemasters are monitoring the players and will offer suggestions when the gamemaster deems it appropriate. The most common hint policy, found in 42% of the facilities, is that players request hints as they need them. This may be done with a buzzer or a knock to request the gamemaster to come into the room, could be done through a walkie-talkie or microphones in the room, or could be done digitally via a computer. Proprietors report that even though players may have the ability to request hints, many do not and instead suffer in frustration, eventually leaving the room in a bad mood. In another 23% of the facilities, players can request hints a set number of times; typically, under this policy, teams were allowed to request 2 or 3 hints. Some rooms impose a penalty for each hint, such as taking time away from the team, adding time to the final score, or not allowing teams to be eligible for the leaderboard.

There were some interesting outliers for the hint systems. A few facilities (3%) would provide no help at all to teams. Some facilities have a timed hint system that is automatic to

ensure teams are on the right track while other have a gamemaster come into the room every 10 minutes to check on progress and offer hints. One facility required teams to wait for 30 minutes before they were able to request hints, and another required the players to find certain items in the room and exchange them for hints.

Success and Failure

While the overall average success rate from the survey was 41%, that doesn't paint the whole picture. Different rooms have widely different success rates, as seen in Figure 11. Reported rates from North & South America (26%) and Asia (33%) were below that average, while rooms from Europe (52%) were above the average. Most facilities are open in disclosing their success rates, as that can help a team choose a room that matches their desires; however, some facilities are not honest in this disclosure in order to help both winning and losing teams feel better about their performance.

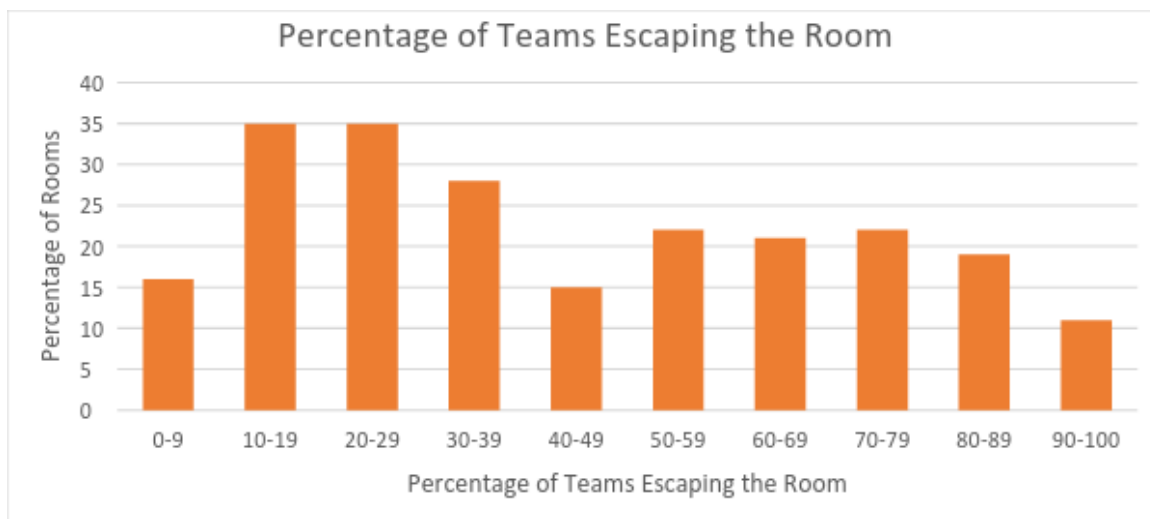


Figure 6: Percentage of Teams that Escape the Room

Designing the Rooms

Most facilities (83%) reported designing their own rooms, and another 8% have some original rooms designed in-house and some rooms that have been designed by others. Designers are evenly split on the use of red herrings; about half of them use false clues and trails in the room to confound the players, and about half of them work to not include any red herrings in the rooms. One designer said that they felt red herrings could create a bad experience for a player who spends considerable time on a puzzle or a path that is not important for winning the game. The reality is that players will take anything in the room as being important, so that even those rooms not attempting to use red herrings as a design choice still have players attempting to pursue the deep meaning of something that is just a decoration.

Escape room designers reflected upon what were their challenges in creating a room. The table below lists some of the challenges in creating a room and what was difficult. The survey contained a five point scale, so the percentages below reflect how many people rated the task as the most difficult level of Very Challenging on the 5-point scale. One of the great surprises for many proprietors is how much damage players do to a room during a game. Thinking about

props that can't be damaged easily and that can be replaced when they are damaged is a lesson that many proprietors learn once they open the room to the public. Playtesters are gentle with room elements, but the general public (especially when fueled with some social drinking before coming to the room) can be very destructive.

How challenging are each of the following elements in creating escape rooms?	Very Challenging
Balancing the Difficulty of Puzzles	47%
Puzzle Creation	46%
Creating Room Elements the Won't Be Destroyed Easily	43%
Integrating the Puzzle and Narrative	40%
Getting the Timing right	34%
Creating room elements that can be easily reset	21%
Developing a Narrative	21%
Playtesting the Rooms	16%

Table 7: The challenge in designing escape rooms.

Learning Outcomes in the Rooms

While most of the games described here were for-profit games, about 30% of them had learning outcomes designed into the games, either as a recreational game with educational opportunities (22%), or as an educational escape room in a few (8%) of the facilities.

The most common learning outcome reported, which is common to all team-based escape games, is teamwork and communication. Successful teams work together, communicate well, and use delegation to tackle the challenges in the room. Because of this, there are many escape rooms that market their services as team-building activities for corporate clients.

A number of rooms taught people about history, geography, and other culturally relevant topics. Some rooms took advantage of an interesting story that is of local interest and use the room to help players learn more about it. Some examples include the Ontario Gold Rush of 1866 (Escape Maze in Peterborough, Ontario), the fall of the Berlin Wall (Make a Break Berlin), the relevance of the structure in which the escape room was located such as a stock exchange (Sherlocked Mystery Adventures, Amsterdam), or the activities of political leaders (Cuban Crisis, Escapology, Orlando).

A few rooms used concepts of science such as astronomy and chemistry. Other rooms required players to engage with concepts from literature, such as folk tales, Sherlock Holmes, or Shakespeare. As many rooms use different forms of encoding messages, players may have an opportunity to learn how to translate semaphore, Morse code, braille, or cipher systems used over time.

There are a few museums that have explored escape rooms. *Museum Escape: The Polar Domes* was a pop-up escape room produced by Rosie Amos from the Polar Museum and Nicola Skipper at the Sedgwick Museum, both part of the University of Cambridge (UK). In *The Polar*

Domes, the players are finding the hidden research of a polar geologist who is afraid that her work is being suppressed by others (Amos & Skipper, 2014). *Memori* was a pop-up escape room run at the State Library of Western Australia and designed by Games we Play and Excalibur productions that had players exploring stories from Western Australia history (Memori, 2014). The escape room concept, as a locative game where the physical space is important, is ideal for places of informal learning that emphasize a physical location.

Conclusions and Design Recommendations

Allowing the Players Choice in Escape Room Policies

Because Escape Rooms appeal to a wide variety of different demographic groups, allowing players choices about the policies and rules governing their gameplay can make it more likely that a player will have an engaging experience. Video games used to offer a single experience; every player would face the same challenge. As video game design concepts matured, however, the addition of variables allowed the player to set some of the constraints around a game experience. Now, the setting of a difficult level in a game is expected so that casual players can enjoy the narrative and lighter gameplay they seek, but hardcore players can enjoy the challenge that they seek.

Since escape rooms are hoping to meet the needs of many different player types, they should allow the players the ability to set their game mode. This will provide a way for a group of players to communicate to game staff what kind of game experience they are seeking. Setting the game mode can dictate the number of clues, the qualification for ranking on the leaderboard, and, for ambitious room designers, some of the puzzles themselves. Facilities with a human gamemaster can easily adjust the difficulty of the game experience by giving more frequent or more cryptic clues. Facilities could also create several versions of the same puzzle that can be swapped out for a group based upon what kind of experience they would like.

Looking to the Themed Entertainment industry to add Replay Value to Escape Rooms

One of the most commonly voiced frustrations by escape room proprietors is how to create rooms that are replayable. There is a significant financial benefit to this for the rooms in building a repeat customer base. Many facilities report that they have regulars who are excited and fill all available slots when a new room comes online, but then they have nothing to offer until another room is available. Prices to play the room are high when compared to other one-hour gaming experiences, so people will pay once for the novelty of the new room. This is the model of the AAA video game industry: considerable investment goes into a single title with the hopes of it selling well enough to provide the funding to create the next sequel. This is the result of escape room proprietors modeling their rooms off of the video gaming industry.

A better match for escape rooms is for them to consider themselves part of the themed entertainment industry. Successful themed entertainment venues think about how to appeal to

the return visitor as well as the first timer. They are still in a constant state of renovation and addition, but the user experience is designed to be something that can be repeated and enjoyed. If an escape room is full of static puzzles and revelations that, once discovered, can be easily repeated, then there is little replay value to the room. This method of room design is currently the industry standard, as it is based off the design of point-and-click adventures and puzzle hunts.

By thinking about creating a replayable experience from the beginning, escape rooms can change their player experience so that is more about having the adventure and less about doing the static puzzle. In his TedX talk, Matt DuPlessie, president of 5Wits, said that they found no patterns between different sorts of players and their enjoyment in specific puzzles, challenges, or special effects. They found three things that players consistently enjoyed: being part of a spectacle, feeling heroic, and engaging with something challenging (DuPlessie, 2013). By creating these three things, it immerses players in a narrative where they are part of an adventure.

There are a few ways to create a replayable room. The first is to create multiple puzzles instead of one. This can be done through computer-generated puzzles, where each team gets a different puzzle to work through. The puzzles can be printed out, facilitated by the computer, or, through the use of RFID, displays, and inexpensive small computers, physical puzzles can have different instructions and solutions. Some designers manually create several sets of puzzles, and a team can request a different puzzle set if they have already played in the room.

Another method, which is used by *MagiQuest* (multiple locations), *Wizard Quest* in the Wisconsin Dells and *Sorcerers of the Magic Kingdom* at Disneyworld's Magic Kingdom, is to create an escape room with many different possible puzzles, and each team gets a different randomly generated path that uses a subset of puzzles. Therefore, while a team may get one or two repeat puzzles on another play, most of the experience will be new.

The method used by 5Wits to keep their adventures replayable is to have puzzle-based tasks that groups must work together to complete. As it is a family-focused attraction, the design focus is not on making mind-bending or tedious puzzles, but rather to create fun puzzles that not only require a solution, but require the group to work together to carry out the solution. One example of this was from *Entros*, a closed themed attraction from Seattle, where one player had to wear a helmet with a camera on it and enter a space with basic physical puzzles that involved simple tasks like tossing balls into targets and the rest of the team offered voice direction to help that player complete the tasks. This task was not about solving a puzzle, but about accomplishing something as a group.

This idea of puzzle-based tasks is at the heart of Boda Borg, an escape room franchise born in Sweden and coming to the United States. At Boda Borg, teams work together to take on quests, which are a series of rooms that have short challenges without instructions. Players must work together to figure out what to do and then accomplish the tasks in a short period of time. Upon completion, the team can move on to the next room. If they fail, they leave the quest, but can start again with their new knowledge. Boda Borg is designed around a videogame structure where players try, learn, fail, and try again. Participants pay to play many games over a set period of time instead of paying per attempt (Boda Borg, n.d.).

Another way to add replayability is to have different endings that players can strive toward, based upon performance. The *Men in Black: Alien Attack* attraction at Universal Studios in Florida is a ride where players have guns and shoot at targets through the game while

accumulating a score. At the end of the ride, the players get a different ending based upon their score, but everyone gets to experience the entire attraction.

Another approach to different endings without the competitive aspect comes from *Memori*, a room designed for the State Library of Western Australia. The designers did not want players to have a bad experience, as the goal of the game was to explore culturally relevant stories. Therefore, they made multiple endings, each of which was satisfactory, and the players saw the ending that corresponded to how many puzzles they solved. Therefore, no players came away feeling like they failed, but they had different positive endings no matter how far they got into the experience (Raynes-Goldie, Lee & Metcalf, 2014).

Replayability is an achievable goal for escape rooms, but it has to be made a priority in design. For rooms wanting to draw a more competitive crowd by emphasizing leaderboards, having rooms that are replayable also makes it harder for a group to cheat for a faster time. As 5Wits has been working in this business for over 10 years, they have figured out the secret to replayable escape rooms; 25% of the business at 5Wits is made up of people returning to replay an adventure (Matt DuPlessie, Personal Communication, March 12, 2015).

Future Work

There are several studies that can follow up and add on to this research. The first study would be to replicate this study with rooms in China and Japan, as they are not well-represented in this study, or to explore how representative the rooms in Singapore and Malaysia are of rooms in other parts of Asia. Another study would be to focus on the best practices in developing escape room puzzles and working on the challenges that were identified as most difficult – creating puzzles, balancing the difficulty of puzzles, creating robust props, and how to integrate puzzles and narrative. A need in the field is ideas on how to create rooms that can be changed between plays in a fair manner, to both reduce cheating and allow people to replay the same game. Another need is to survey players in the same way that this study explores facilities and see where expectations match and where there are opportunities for improvement. More detailed psychological and sociological experiments on how different types of players interact with different types of puzzles and tasks, at both an individual and group level, would help designers make better choices.

Since my focus is on informal learning, my future research is focused on how to use escape room concepts for educational purposes and, more specifically, in places of informal learning like libraries and museums. Escape rooms create a moment of passion around specific topics that then can be used as the spark to then ignite interest in something for a player to learn more about later.

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Bibliography

Bucket List Productions (2015). Home. *Room Escape Adventures*. Available online at <http://roomescapeadventures.com/>

Duplessie, M. (2013). Go analogue. [video] *TedXBoston*. Available online at <https://www.youtube.com/watch?v=tTcl5I0Wbzk>

Enigmarium Escape Room (2015). Prvi Escape Igloo na svetu! Available online at <http://escape-room.si/prvi-escape-igloo-na-svetu/#>

Howitt, G. (2012). Frothing at the mouth. *Look, Robot*. Available online at <http://lookrobot.co.uk/2012/09/11/emergent-gameplay-larp/>

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

Raynes-Goldie, K., Lee, H. & Metcalf, R. (2014). *Be Inspired @ the State Library: The Memroi Escape Room* (Audio recording). Available at http://www.slwa.wa.gov.au/whats_on/audio_and_video/events_and_talks