

escape rooms & their place in education





introduction **07**

literature review **09**

- i : background and introduction
- ii : transferable 21st century skills
- iii : collaborative learning
- iv : student engagement and motivation
- v : adaptability of escape rooms to other subjects
- vi : conclusion

methodology **15**

- introduction
- data collection methods
 - i , ethnography
 - ii , questionnaire
 - iii , focus group discussion

research studies **19**

- introduction
- section i : research aims
- section ii : method plan
 - i , participants
 - ii , considerations
 - iii , data collection
 - iv , creating the puzzles
 - v , making the box
 - vi , the questionnaire
- section iii : conducting the research
- section iv : the results
 - i , initial hypotheses
 - ii , methods used to analyse the data
 - iii , results
- conclusion

reference list **39**

consent form **43**



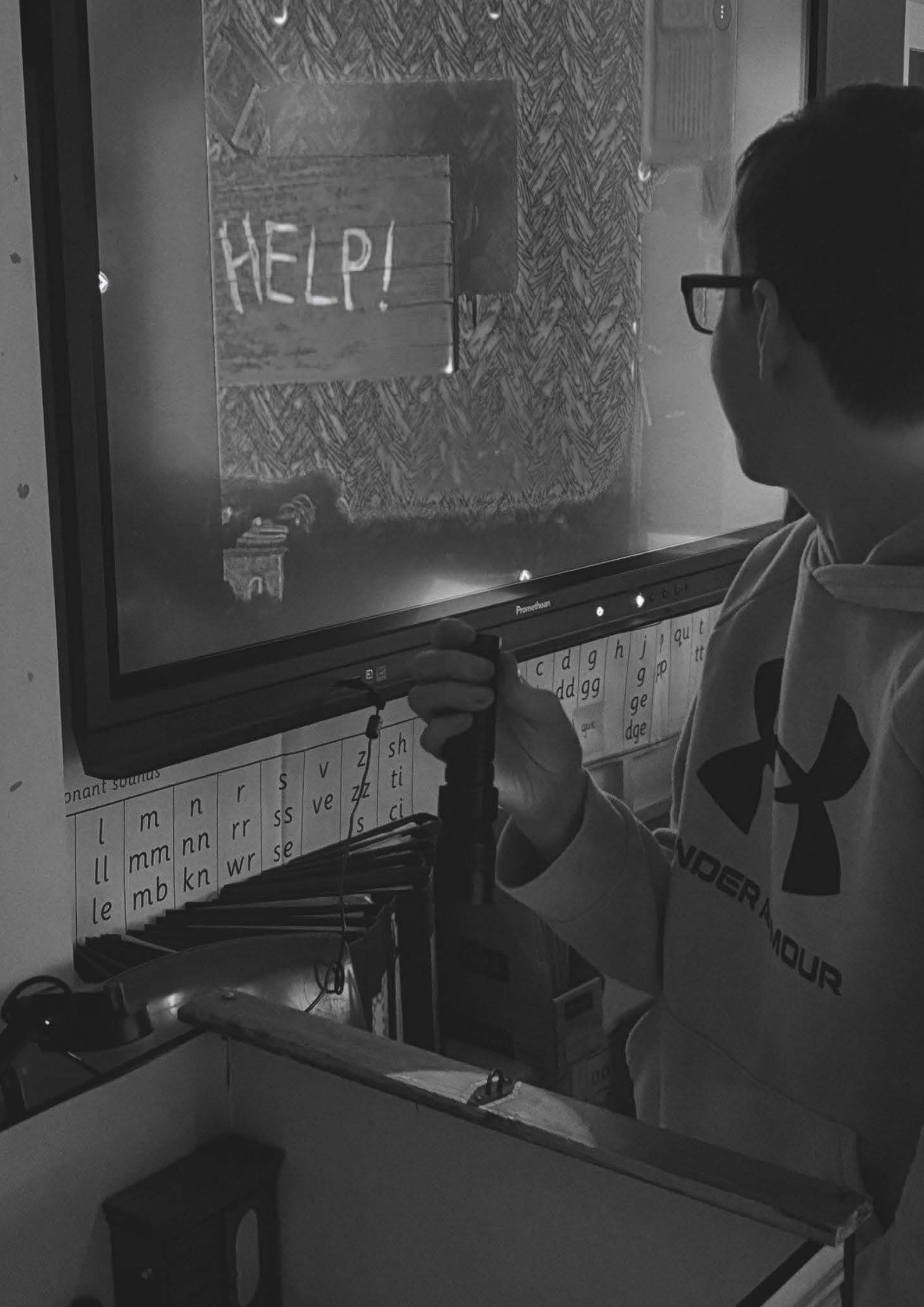
introduction

Boredom is an issue that's being explored heavily in Educational research (Yacek, and Gary, 2022) and there are many new methods that are effective in improving student engagement in classrooms, one of which being gamification and escape rooms.

Some early ideas that are often linked to escape rooms are programmes like 'The Crystal Maze'. First aired in 1990, the concept was "a team of 6 contestants play a series of physical, mental skill and mystery games across 4 themed zones", in addition to escaping the maze, at the end of the show they got the chance to enter "the Crystal Dome" to win prizes, the time they had in the dome determined by how well they did in the puzzles (IMDb, 2024). The first company to actually create physical escape rooms you could enter was one by the name of 'SCARP', they took inspiration from online video games and they opened in 2009 (Hall, 2021). According to an article in the Guardian written in 2019, in the UK alone, there was around one and a half thousand escape rooms (Usborne, 2019).

Educational opportunities using these activities are mostly unexplored, however recent studies have been completed on the impact of escape rooms in educational settings and whether or not they could be beneficial to students in their learning. This study looks at how immersive experiences can impact students in primary schools, specifically in areas of concern such as engagement and enjoyment, starting with a literature review to frame the research in context of other studies and to explore any gaps in existing knowledge, a methodology section outlining the methods used and their strengths and weaknesses, an overview of how the experiment was created and how it works, the results, and finishing with a discussion of the findings in context with suggested areas of further research opportunities.

This study argues that escape rooms have their place in an educational setting due to the fact they encourage active learning, collaboration, the development of life skills and 21st Century skills, and improve focus and enjoyment in learning.



HELP!

onant sounds

l	m	n	r	s	v	z	sh
ll	mm	nn	rr	ss	ve	zz	ti
le	mb	kn	wr	se		s	ci

c	d	g	h	j	qu	t
dd	gg		g	pp	tt	
			ge			
			dge			

literature review

chapter one

i : background and introduction

Escape rooms have recently become a popular recreational activity in which teams of a minimum of 2 people have to solve puzzles in order to unlock various items in order to reach an end goal of escaping/achieving a shared goal based on the theme or story of the escape rooms. Escape rooms are known for their immersion and challenging puzzles, racing against the clock, participants will utilise problem solving, teamwork and communication skills.

There is a continual need for innovation in education, historically many theories have been developed in an attempt to find new and better ways of delivering lessons and knowledge to students. For example, experiential learning theory, coined by David Kolb in the 1980s centres around “learning by doing” and values experiences as a way of aiding students in remembering what they’ve learnt (Main, 2022). Alternatively there’s behaviourism learning theory that is “based on a system of routines that “drill” information into a student’s memory bank.” (Fairbanks, 2021). A new practice that’s coming into popularity is the use of escape rooms and other gamification methods in education. Game based learning (GBL) is becoming an ever more frequent method of engagement and alternative teaching in modern schools, with teachers finding alternative routes to worksheets and repetition.

This literature review will look at the research already done on escape rooms as a pedagogical tool and examine the effects of this method on teaching transferable 21st Century Skills, how it benefits collaborative learning, the impacts it has on student’s motivation and engagement, the adaptability of escape rooms to different subjects, how relevant they can be to curriculum, integration into the classroom and the impact this has on the workload of the teacher, inclusivity, and what factors make a successful educational escape room.

It is important for teachers to be educated on how escape rooms could be used in education so that, if they feel that this method, or similar methods may be useful to their students, they can implement them; alternatively they can adapt and change aspects to fit the needs of their pupils.

ii : transferable 21st century skills

The Glossary of Education Reform defines 21st Century Skills as “a broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today’s world”. A report conducted on behalf of the UK government in 2019 (Joynes, Rossignoli and Amonoo-Kuofi, 2019) categorises 21st Century Skills into 4 key words, named “The ‘4Cs’: Critical thinking, Communication, Collaboration, and Creativity”. The report also states that “many commentators conclude that there is currently little or no substantial evidence available on the most effective tools and approaches to deliver those skills”, however, many studies and articles on escape rooms and gamification in education may be a useful method to fostering these skills in educational settings.

Egan, Banter, and Sorgen, 2021 focuses specifically on the skill sets developed in a leadership capacity. After conducting a study in which participants played an escape room and then were debriefed afterward, they found that there was a definitive positive difference to the participants “communication, listening, advocating for a point of view, and conflict negotiation”, all of which fall under the categories defined as the ‘4Cs’. The study showed that by participating in the escape room the students felt the most significant increase in the skills of “advocating for a point of view” and “competency”, and an overall improvement in their communication. This is supported by other sources, one

example being Teraldsen, 2022, in which the review states that there is a focus on researching how escape rooms can help develop 21st Century Skills in an educational setting, and that the consensus among many articles is that the skill sets fostered and developed in escape rooms are those defined under the '4Cs' structure. Another example being a study in which future teachers played an educational escape room and completed a survey afterward (Hunt-Gómez, et al. 2020). The majority of the participants thought it "improved the capacity for complex-solving tasks" and "that the use of escape rooms in the classroom helped the promotion of communicative skills, problem solving abilities and critical reasoning". Although most research agrees on this fact, a study performed in 2020 suggests differently.

Duncan, 2020 compared two different groups of students who, over the course of 2 months, took different approaches to learning, one using game-based learning, and the other using traditional methods. The results showed no noticeable difference in the improvement of these skill sets. The article concludes noting that although they did not get any quantitative data that there were improvements in this area, the main feedback from the students mentioned teamwork as their main driving factor during their learning over the 9 weeks.

Overall, there is a lack of definition of what exactly 21st Century Skills are defined as, however there is a wide range of skills commonly considered in the category that have been shown to be used, and therefore developed, in an escape room setting. These skills are seen as useful for the future and have recently been encouraged to be taught.

iii : collaborative learning

Escape rooms have a base in working as a team and supporting each other (Wargo and Garcia, 2021) and this, in an educational setting, naturally encourages a collaborative approach to learning. Studies have confirmed lessons that are collaborative, student driven, and active "lead to deeper learning" (Cornell University, 2022). One study showed a group of students learning a language through a collaborative approach performed significantly, academically better than a group of students who were taught through a solitary approach (Marcos et

al, 2020). The majority of research written on escape rooms used in an educational setting confirms that the approach focuses on teamwork and collaborative learning as a positive factor in learning.

Studies on educational escape rooms have noted that students developed their skills in leadership, time management, and among many others, teamwork (Jimenez, et al, 2020). During Stohlmann's study in 2022, teamwork was encouraged through instruction and through Stohlmann checking up on the student to ensure that everyone was participating, it was found that teamwork, and naturally communication were encouraged through the design of the puzzles in the escape room and that they found it a valuable part of the experience. Group work means the students have to work with people they might not usually in order to reach the same goal, providing a sense of camaraderie (Hunt-Gomez, et al, 2020). When future educators were asked to "mark options that describe your intellectual experience when participating in an escape room", the ones the majority marked were: "cooperative work", "collaborative", "non-individualistic". When asked how children in educational settings would describe escape rooms, 98% said they would find it collaborative, and 90.7% said "not one promoting individual work". The participants noted there was a competitive element to the method, although it is driven by teamwork (Hunt-Gomez, et al, 2020). Nearly all of the research on escape rooms used for education point to collaboration and teamwork playing a vital role in the process of learning using this method (Grande-de-Prado, 2021). Another benefit of collaborative learning stated is that "students' who learn through collaboration build powerful concepts and ideas in group discussions and their interaction with peers or instructors" (Asif Qureshi, 2023), this is massively impactful in escape rooms as problem solving and creative thinking is a requirement for success (Veldkamp, 2020).

The literature seems to agree that collaboration of students forms the foundation for educational escape rooms, it also shows this improves skills such as communication and self-reflection and evaluation. According to Duncan, 2020, teamwork was also a significant factor in the engagement and motivation of the students.

iv : student engagement and motivation

Student engagement is key to a positive classroom environment, it minimises disruption and influences their academic performance. In 2023, The Telegraph asked students to respond to the question, "what motivates you to learn?", in return they got responses that included teachers passionate about what they are delivering to them, personal interests in the topics, and lessons that expand their world view. Additionally, one of the topics was that they enjoy "hands-on, interactive activities". One reply said "I believe the occasional interactive or hands on activity that makes students figure things out for themselves is beneficial"; another: "Listening to a power point with a teacher speaking in a monotone voice with a boring subject puts me to sleep. I need something interesting ... something fun." The available research into escape rooms has shown that the method has elements that students value, improving their engagement and excitement.

One example of this is in a report by Duncan, 2020 in which students listed the top reasons for engagement as "collaboration and teamwork as the number one motivator, followed by challenge and fun." (Duncan, 2020). When asked about their responses to their escape

room GBL experience, with students responding with statements such as: "BOEDU strategies are absolutely fun.", "I wish all learning could be like this", "I hope we can do this again next year" (Duncan, 2020). This shows that engagement was heightened as there is motivation to do it again, the participants found it a valuable experience that was clearly memorable.

However, some of the students mentioned that due to the time constraints they said they "we freak out, and we lose our concentration", and "one student pouted as he said, "wasting time" (Duncan, 2020). This contradicts the majority of the research out there about motivation and escape rooms, however it's worth noting that this is something that can be changed depending on the class, time constraints may put pressure on the students and this shows more that the escape room must be carefully designed to avoid disengagement from the lesson.

The authors acknowledge that only having quantitative data for student's motivation doesn't represent the "full spectrum of student engagement", this is why they've included the qualitative data also, to try and show the range of student opinions as best they can (Duncan, 2020). The mostly positive responses to escape room methodology is supported by

Table 4 Identified themes regarding motivational triggers from engaged students

Identified theme	Number of references	Sample quotes from participants
Collaboration/ Teamwork	19	"The best part was teamwork plus using our mind." "I loved doing it with my friends at my table." "I liked that you didn't have to be by yourself."
Challenge	16	"If it wasn't challenging it would be boring." "It was full of learning and challenges." "We put in a lot of hard work."
Fun	15	"Going through all of the solutions, the problems would be a fun way to review work." "It was actually very fun." "It would just delight us whenever we found out one of the answers to one of the locks."
Time constraint	10	"Working against the clock kept us going." "We wanted to open the box and finish the clues before the clock."
Success	8	"Once you finally succeeded, that was the best part." "The best part was actually breaking out." "The sense of accomplishment of doing it."
Reward	5	"I liked it best because of the candy." "I wanted the prizes."

Source: Duncan, 2020, p.6

Stohlmann's study, in this it is noted that the participants said that the lesson passed by quickly and that they found the work to be "a fun challenge" (Stohlmann, 2022). Another support that supports this is Egan, Banter, and Sorgen, 2021 in which over 4/5ths of the students said in response that they felt that they wanted to "study preparation materials" and took nearly an hour and a half on these materials.

The motivation and engagement of pupils is important to a healthy classroom environment, but the lessons must be well rounded and the motivation must continue in different topics.

v : adaptability of escape rooms for different subjects

Due to escape rooms being flexible and personalised with a variety of different puzzles and themes, they can adapt to various different subjects across the curriculum.

There is little research on how escape rooms can be taught in subjects that don't fall under the category of STEM subjects or health care scenarios. There's a serious lack of data on escape rooms and their use in creative subjects, such as English or Art. Additionally, the majority of research is focused on students in further education, veminimal studies conducted on those in primary or secondary school. This could be due to the fact that jobs in areas such as pharmaceuticals or medicine often require a mix of social skills, teamwork, and theoretical knowledge, in which escape rooms have been found useful to teach all at once (Teraldsen et

al, 2022).

One article that does explore a GBL method outside of a STEM field is Tzima, Styliaras, Basounas (2021). The study aims to find a way to encourage interest from young people in cultural heritage and history. It also looks at how well escape rooms work outside. They found there to be many positives about the experience, such as: they showed "positive attitude, enthusiasm, and interest about local history and cultural heritage." It also discover that their escape room can be used outdoors.

More research needs to be conducted on this topic so as to fully assess the place escape rooms have in schools.

x : conclusion

Research into escape rooms and education is in the early stages. There are gaps in the research when it comes to studies done with children in primary schools and for topics that don't fall under the category of STEM. There is also a noticeable shift of studies leaning toward using digital escape rooms over physical versions. Overall, the literature available agrees that this method of educating fosters, and is reliant on teamwork and collaboration among students and that students feel motivated and engaged when learning through this practice. Studies have also shown that these methods can improve key skills such as collaboration, creativity, and leadership qualities. Further research into escape rooms and education would be useful as it could give insight on their benefits to teaching both academic skills and life skills at once.





methodology

chapter two

introduction

Through looking at the literature available on escape rooms and education there is a gap in knowledge in two parts:

- Escape rooms tested on primary school age children
- Topics that aren't STEM subjects.

The primary research aims to bridge the gap in the knowledge and confirm existing knowledge by answering the questions:

Do primary age children find escape rooms useful tools in their education?

Can escape rooms work as an educational tool for non-STEM subjects?

How do primary school children respond to an alternative teaching style?

For my research I created an escape room in a box that I took to a primary school to test on the primary 7 students. I used a mix of observation, discussion, and survey to gather my data. I deemed it necessary to have both qualitative and quantitative data as it would allow me to look at individual opinions but also the collective opinion of a class working together. This chapter will detail the aims of the research, the choices considered in the way the research was conducted, the participants of the research, the methods used to collect data, the design of the escape room and a walk through of the puzzles.

data collection methods

ethnography

Ethnography is a qualitative research method that involves the researcher being an active participant in a study in order to "understand the cultures, challenges, motivations, and themes that emerge" and stems from cultural anthropology (Cleland, 2017). It allows the researcher to gather ideas on the participants' behaviours and actions. Ethnography can be useful in that there's a direct interaction with the researcher and can provide deep understanding of the

findings, however it can also be challenging to focus on specific conclusions of the results (Amuomi, and Collins, 2020).

This method was appropriate to use in the context of my study because the children needed someone to take them through the lesson, I had knowledge on the room, how the locks worked, and how the puzzles were to be solved. It was also appropriate that I be participating as the lesson needed to be kept on track and if it were a real scenario, a teacher would be present and involved too.

questionnaire

Questionnaires are beneficial to gain quantitative data from large groups quickly and easily (Jones, Baxter and Khanduja, 2017). When used on a large sample group there can be issues in getting responses which can impact the validity, however as my participant group size was small and I hand collected the surveys, I didn't have this issue. This research method was useful in gathering quantitative data on the children's response to the escape room, this data was needed to directly compare and conclude from the findings, an advantage the ethnography didn't provide.

focus group discussion

Focus groups, often used for testing products, allow the participants the advantages of a group setting which can foster discussion and the sharing of opinions and ideas to develop their own. The role of the researcher is as the facilitator of the focus group who directs the study through prompts and encourages discussion between participants. (UK Government, 2020)

This was chosen to end the session to gain a deeper insight into the opinions of the children on the escape room, but mainly to encourage confidence in any negative feedback they had about the room that they didn't feel comfortable sharing without prompt.

feedback form

thank you for participating in my study, please read over the questions carefully and respond with your own thoughts and feelings.

on a scale of 1 to 5...

☹️

1

2

3

4

5

😊

how engaged were you during the lesson? (did you find it easier/harder to pay attention?)

how well did you work as a team?

would you be happy with more lessons like this?

do you think you would learn better though doing similar activities?

did you enjoy the lesson?

please write a little bit about the lesson:

feedback form at the end





research studies

chapter three

section i : research aims

The research aims were to understand if escape rooms are a good method of education for primary school children and, if so, why that was. Through the research I wanted to find out their honest opinions about the lesson. I wanted to find out whether or not they found it useful and, most importantly, engaging.

section ii : method plan

ii, i : participants

The participants were 14 students in P7 of mixed abilities, experience with escape rooms and genders. They were in groups that they usually wouldn't choose to work with so I could see how the dynamics worked between those of varying levels and experiences, it was also useful to see how communication worked between those who usually wouldn't spend time together. The majority of the pupils had not participated in an escape room before.

ii, ii : considerations

One thing I thought most important to consider in conducting my research was making sure it was an enjoyable and comfortable experience for the children, not only because I cared about their experience being a positive one, but also so that they felt as though they would be able to give their 100% honest opinions so the research was as valid as it possibly could be.

ii, iii : data collection

I gathered my data through walking around the classroom as they were completing the escape room and noting how they worked as a team, the engagement in the task, and the mood of the children, whether they were enjoying and interested in the task or they were finding it frustrating. Then once they completed the escape room I handed round a form in which they had to tick from a scale of 1 to 5 their opinions of the escape room and then write down some additional comments about their experience. Finally, we had a whole class discussion where I asked questions such as "do we feel like you would

learn better through methods like these?", "did anyone feel they struggled to stay focused on the task at hand?", and if they had any suggestions for improvements for the escape box. The aim of this was to gauge their opinions on if they thought an escape room was a useful and interesting way of learning.

ii, iv : creating the puzzles

The first stage was developing the puzzles for the children to complete and to choose a theme for the escape room. This included looking at the curriculum for excellence and picking out a topic that was relevant and also creating puzzles that would cover the requirements for second level, this included the topic being local history, and puzzles such as reading maps.

The following is a walkthrough of the puzzles and their solutions:

the story :

The children are detective inspectors in Edinburgh during the Victorian Era, there's been strange murders happening and last night their colleague saw two men acting suspiciously in a graveyard. They dug up a body and sold it to a local anatomist called Dr. Knox. The inspectors need to get into Dr. Knox's lab and see if they can find any clues as to the whereabouts of the men.

step 1 :

Each table receives a map and a newspaper.

Each child is given a certificate to fill out as they uncover the murder mystery.

The first letter is displayed on the smartboard.

solution :

The children must look at the newspaper and identify the symbol that represents Dr. Knox (an orange diamond). They then find the orange diamond on the map and receive the coordinates of the lab (11,10)

They can then unlock the main box that represents the lab.

step 2:

The children are encouraged to explore inside the box and look at the furniture.

On the wall of the box is a hint:

RED BLUE GREEN BLACK

solution :

The children look in the furniture in which there are miniature books, each with a number written in a different colour.

They use the hint that was on the wall to put the numbers in the right order, giving them the code 4371. They can then unlock the small box.

step 3:

Inside the small box is a UV torch and they now have to find a code for the last box.

solution :

Using the UV light they discover the world help written on the dissection table and use this to unlock the last box.

step 4 :

In the box is the second letter with descriptions of the suspects and the suspect cards are put up on the smartboard.

solution :

Using the date on the letter and the mens date of birth, descriptions of the suspects height, eye colour, hair colour, and accent, they must deduct that the men responsible are Burke and Hare. They can now fill in the suspect names on their certificate.

step 5 :

They now receive the final letter marked 'urgent' with a letter in code.

solution :

Using the hints on the letter they must decode the letter to discover Burke and Hares route on the map (the meadows, the kirk, dr. fraser, west port, start, the centre)

They then must use the newspaper and the map together and draw out burke and hare's route, then they find that they're hiding in the graveyard at the centre of their route, castle hill. The children then fill out the certificate with where they found the criminals and their name.

(examples of all the above puzzles shown at the end of chapter)

ii, v : making the box

Once I had created the puzzles I created the box. I first created an illustration for detailing the side of the box and to use as the flooring in the box. I used 9mm thick MDF for the box, and a laser cutter to apply the illustration. After the walls and bottom of the box were complete, I assembled the box, adding hinges and a hasp for the lock. Then the task of decorating the inside of the box, I used sugar paper for the walls and stuck down dollhouse furniture. The aim of having a miniature box instead of just paper is to see how the students reacted to something tangible that they could interact with, while the product would also be easy to store in a classroom.

ii, vi : the questionnaire

I first introduced myself to the students and explained to them what I was studying, what I was researching, what they would be doing with a timeline of the tasks, and things to remember, such as to have fun and work as part of a team. They then began the escape room, the letters were read out to them and I walked around the

section iii : conducting the research

I first introduced myself to the students and explained to them what I was studying, what I was researching, what they would be doing with a timeline of the tasks, and things to remember, such as to have fun and work as part of a team. They then began the escape room, the letters were read out to them and I walked around the classroom with the teacher and offered support to any students that needed help. The escape room had a combined method of working just in their tables, and working as a whole class in order for me to ask at the end which they preferred and which they found more useful.

Once the escape room had been completed, I passed around the forms and talked through each of the questions so they understood what the numbers represented and what I was wanting to know from each question. For example, for the question "how engaged were you during the lesson?" I explained that 1 would mean they were very distracted and 5 would be very engaged. After going through all the questions, I asked them to add some comments at the bottom and back of the questionnaire on what they found interesting

and, after the form, we had a whole class discussion about how we felt the lesson went. I asked questions about what they found most interesting about the lesson, if they enjoyed working in groups, if they thought it was a useful method of learning, and if they felt they used lots of different skills (such as numeracy and literacy).

section iv : the results

iv , i : initial hypothesis

Do primary age children find escape rooms useful tools in their education?

Primary school students find escape rooms are helpful in keeping them engaged in a topic they're learning about. They encourage teamwork, communication, development of leadership skills and are an enjoyable activity.

Can escape rooms work as an educational tool for non-STEM subjects?

Despite the lack of research on this, escape rooms are tools that can hold their own in many different topics due to their adaptability.

How do primary school children respond to an alternative teaching style?

I believe the children will respond positively to the escape room, I believe that some children won't enjoy the aspect of teamwork and that some may find it difficult to keep concentration.

iv , ii : methods used to analyse the data

The methods used for analysis are creating tables and graphs to analyse the quantitative data gathered through the survey, identifying key themes and words from the focus group, and the observations gathered through the ethnographic observation.

iv , iii : results

ethnography :

Throughout the pupils playing the escape room I observed them working together as teams and communicating strongly. They discussed the puzzles and possible solutions heavily and were sharing ideas about the answers they've come up with. One table had one pupil who was taking the lead in solving the puzzles as he had done escape rooms before, speaking to the teacher of the class she said this is something he is very passionate about so this is why he might've taken a more solo approach. When that student found the next puzzle difficult, this

is when the next members of the group pitched in to help solve it.

There was one table in particular that found the initial puzzles challenging, however when given a small hint and pointed in the correct direction, they picked it up very quickly. Although they struggled with some of the puzzles, they excelled in some that the other tables didn't.

Another observation was that the students were all very engaged with the puzzles, their conversations were about little else and when you looked across the classroom they all had their heads down and were focusing purely on working out the solutions, this was also the same when I was using the powerpoint and talking through it.

The students showed a huge amount of interest in using the locks and the boxes and getting to physically be involved in and touch the box. At the start I forgot to mention that we would be waiting for all the groups to get the solutions before we moved on to the next step, whether it be the next puzzle or opening the box, so when the first table solved the puzzle they ran up and began using the lock. This showed a sense of passion in the lesson and a competitive element that could be utilised for future developments in the escape room.

survey :

The survey afterward showed the main thing that the students thought about the escape room was that they had fun, the majority of responses included the word 'fun' and some had comments saying that they would like to do it again.

To the question of working well as a team the data showed that all of the students thought that they worked well as a team, which was backed up in the 'additional comments' section of the survey in which there were references to this made.

Almost the entirety of the class said that they would strongly agree with the fact they were engaged throughout the lesson.

There was an even split between students that would agree and strongly agree with the fact they worked well as a team.

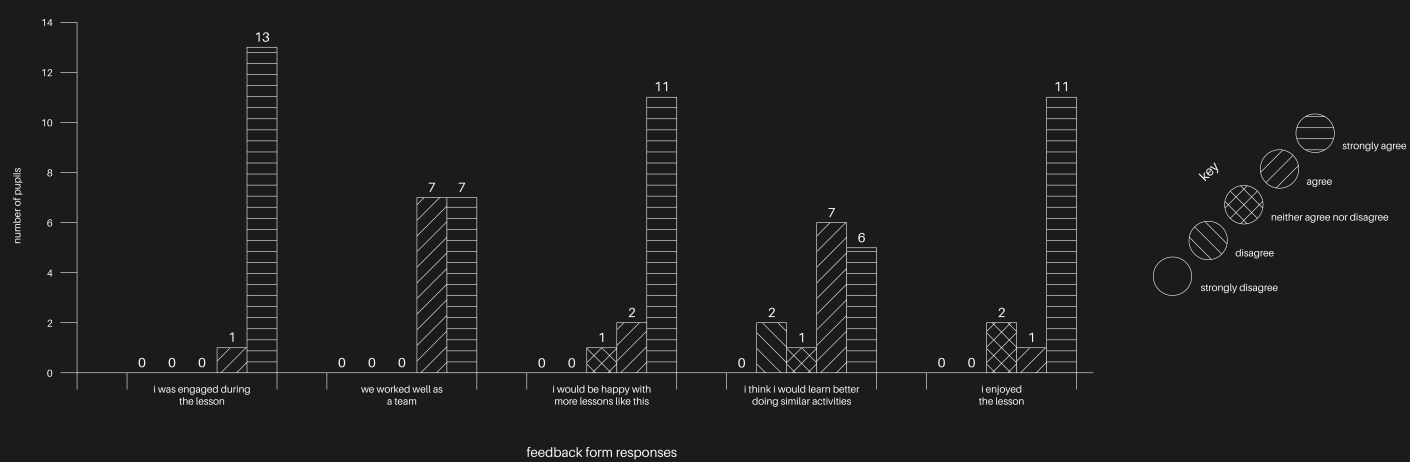
table 1:

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
i was engaged during the lesson	0	0	0	1	13
we worked well as a team	0	0	0	7	7
i would be happy with more lessons like this	0	0	1	2	11
i think i would learn better doing similar activities	0	2	1	6	5
i enjoyed the lesson	0	0	2	1	11

table 2:

theme	no. of references	sample quotes
fun and enjoyment	17	" I would love more lessons like this and it would be a lot more fun " " I enjoyed it because it felt like i was a real detective. " " I really want to do it again! " " Everyone enjoyed it and i think everybody would want to do it again. "
interacting with the props	13	" It went really well, and i liked the box " " I loved all of the clues, torch, box " " I loved the blue light and the box " " We had to find mini books and get the clues to unlock the codest! "
engagement	4	" I thought it was engaging " " I was very engaged and focused " " It was very engaging and everyone was working hard "
challenging	3	" Very fun, interesting details, good challenges. " " I really liked the lesson because it was challenging " " I liked this because it was not too easy but not too hard as well "

chart 1 representing table 2:



The majority of students said they would be happy with more lessons like this.

To the statement of "I would learn better doing similar activities", the majority of students either agreed or disagreed, 2 said they would disagree and one was neutral.

The vast majority of students said they enjoyed the lesson.

(Quantative data shown on page 22, transcript qualitive data shown on page 24)

focus group :

My aim with the focus group was to get any negative feedback they didn't feel comfortable sharing until I encouraged it. The main sentiment was that it was a really fun task and they enjoyed interacting with the box, that seemed to be the main selling point for them.

Some of the positive feedback shared was that it would make lessons more fun and that they would find it a helpful tool in their learning.

The negative feedback I recieved was in opinions to the teamwork, there were a couple of students in the class that didn't enjoy this however in speaking to the teacher these students often dislike the groupwork tasks so I dont think it was specifically in relation to this lesson. The other negative feedback was about the actual design of the escape room in that they found some of the puzzles too easy.

conclusion

In conclusion my research shows that, overall, the primary school children responded positively to the lesson in terms of their enjoyment, engagement and team work. In future, more research could be done with individual groups to assess the dynamics more closely, however due to the time frame I had to execute the experiment, I thought it was more important that I test the lesson on a larger group of students. Another area research could be done is how different age groups respond to the escape room lesson.

would you be happy with more lessons like this?



do you think you would learn better though doing similar activities?



did you enjoy the lesson?



please write a little bit about the lesson:

I thought it was very fun but also a good learning experience. I would love more lessons like this and it would be a lot more fun and easier to learn.

transcript of responses in the comment section of the feedback form:

" It was really fun doing the activities and I liked the murder task. It went really well and I liked the box "

" I thought it was very fun but also a good learning experience. I would love more lessons like this and it would be a lot more fun and easier to learn. The box and problem solving was so fun and exciting "

" It was very fun to do, I really like the box with all the tiny furniture and the design on the outside. "

" Very fun interesting details, good. liked finding books and codes, but a bit hard to read the map "

" I enjoyed it because it felt like I was a real detective. I hope that our class can do it again. Well done! "

" I liked how everyone got a shot, the book was very fun, I think there should be more clues/ activities. I think the challenge was great. thanks. "

" I really liked the lesson because it was challenging and fun at the same time. "

" I loved the blue light and the box, amazing, so fun and good team work "

" I thought it was engaging and fun to work as a team. I loved trying to find the suspects. "

" I loved all of the clues, torch, box and how nice the girl was as well as how she helped out our group when we needed it. I really want to do it again! "

" I loved the box and everything! "

" We had to find many books and get the clues to unlock the codes. I liked this because it was not too easy but not too hard as well and they also really enjoyed it when we were working out the codes and the murders. "

" I really enjoyed it and looking inside the boxes for clues. Was very engaged in focused and found it really fun. "

" it was very engaging and everyone was working hard to. everyone worked together as a team and everyone enjoyed it and I think everybody would want to do it again. "

November 16th 1828

Dear Detective Inspectors,

I am writing to you because you are our last hope.

We have been following a trail of murders throughout Edinburgh, which have led to no arrests so far. However, a new lead has come to our attention.

Last night, Constable Jones followed 2 suspicious figures through West Port to to a graveyard. The men dug up a body and sold it to a local anatomist by the name of **DR. ROBERT KNOX**.

We have reason to believe these men are also responsible for the murders we have been investigating, but they ran away before Constable Jones could catch them.

The men have been spotted in Edinburgh and now it is up to you to find out where they are. I suggest going to the laboratory where Dr. Knox works and investigating there. I've supplied you with a newspaper which should help in finding him.

Best of luck Detectives and be careful,

*Commissioner
McSweeney*

the first letter



the map



step 3 code

THE DAILY SCIENTIST

EST. 1798

SATURDAY 15TH NOVEMBER 1828

NO. 551



*Featuring papers by
Edinburgh's finest:*

- Dr. R. MacLeod
- ▶ Dr. D. Fraser
- Mr. C.P. Finlayson
- ★ Dr. J. B. Morrell

NEW VICTIM OF WEST PORT MURDER SPREE, 💀 LOCALS WORRIED 💀

*POLICE ARE SAID TO HAVE LOST A POSSIBLE
SUSPECT, RESIDENTS CONCERNED OF SAFETY.*

LABORATORY DISCOVERIES OF ♦ DR. KNOX ♦

*"The object of the anatomist has
ever been, and ever must be, to
examine with the hand and eye
unaided by magnifying glasses
of any kind"*

THE useful arts of Medicine and Surgery are only entitled to the name and dignity of professions when based on descriptive anatomy. It is to the labours of the anatomy of adult forms that Medicine, Zoology, and Geology owe their present position, whatever that may be. For the Medicine which appeals not to Anatomy is empiricism; and the Zoology not based thereon is not science. That profound instinctive tact guided by genius may do much unaided by Anatomy. I am free to admit: Hippocrates was an able surgeon and a skilful physical, though no anatomist; Linné an admirable zoologist, though ignorant of the structure of "the kingdoms" he so skilfully arranged; both trusted to the observation of what Nature presented to them; for them that was sufficient; genius did the rest.

CONTINUED PG.13



the newspaper

November 20th 1828

Dear Detective Inspectors,

Please excuse my unprofessionalism in dealing with this case and the investigation, I have been reprimanding Constable Jones all day for letting the damned criminals run away; the station is in shambles, as is Edinburgh.

I am writing to inform you of Jones' description of the criminals you are searching so diligently for:



- The suspects were around 20 -26 years old
- One was blonde, the other brunette
- Jones believes he heard them speak Irish



This is all Jones remembers, I'm sorry to say, rest assured he is being dealt with in the proper manner!



Good luck with the search detectives, our reputation as Edinburgh's protectors is reliant on your success,



*Commissioner
McSweeney*



the second letter



CITY OF EDINBURGH CONSTABULARY		NO. 2465
NAME	WILLIAM HARE	FINGERPRINT 
HEIGHT	5FT 11IN	
D.O.B.	1807	
HAIR COLOUR	BRUNETTE	OFFICER 
ACCENT	IRISH	
EYE COLOUR	BLUE	

CITY OF EDINBURGH CONSTABULARY		NO. 2364
NAME	PAT DAWSON	FINGERPRINT 
HEIGHT	5FT 5IN	
D.O.B.	1770	
HAIR COLOUR	N/A	OFFICER 
ACCENT	ENGLISH	
EYE COLOUR	BLUE	

CITY OF EDINBURGH CONSTABULARY		NO. 2466
NAME	WILLIAM BURKE	FINGERPRINT 
HEIGHT	6FT	
D.O.B.	1805	
HAIR COLOUR	BLONDE	OFFICER 
ACCENT	IRISH	
EYE COLOUR	BROWN	

CITY OF EDINBURGH CONSTABULARY		NO. 2358
NAME	BRIAN WILLIAMS	FINGERPRINT 
HEIGHT	6FT	
D.O.B.	1806	
HAIR COLOUR	BLONDE	OFFICER 
ACCENT	SCOTTISH	
EYE COLOUR	BROWN	

CITY OF EDINBURGH CONSTABULARY		NO. 2362
NAME	JOHN COOPER	FINGERPRINT 
HEIGHT	5FT 11IN	
D.O.B.	1800	
HAIR COLOUR	BRUNETTE	OFFICER 
ACCENT	IRISH	
EYE COLOUR	GREEN	

CITY OF EDINBURGH CONSTABULARY		NO. 2368
NAME	JOHN GIBSON	FINGERPRINT 
HEIGHT	6FT 2IN	
D.O.B.	1801	
HAIR COLOUR	RED	OFFICER 
ACCENT	IRISH	
EYE COLOUR	BLUE	

the suspect cards

November 25th 1828

URGENT

Dear Detective Inspectors,

Well done on identifying Burke and Hare as the culprits of these dispicable crimes against our community.

We have intercepted a letter from Mr Burke to Mr Hare that details their hiding place, the only issue is that they now know we're onto them and it's written in some sort of code.

Jones and I have had a bash at deciphering it, however Jones is useless and I only managed to figure out 4 letters.

It's up to you now detectives, decipher the letter then go and catch Burke and Hare wherever they're hiding.

Proceed with caution, these men are dangerous,

*Commissioner
McSweeney*

the final letter

OF OUR ROUTE.

31

G

A	B	C
D	E	F
G	H	I

J.	K.	L.
M.	N.	O.
P.	Q.	R.

L

.

U

S

U

T

V

Y

W

Z

X

y

final puzzle hint

THE DAILY SCIENTIST

EST. 1798

FRIDAY 28TH NOVEMBER 1828

NO. 569

SUSPECT ONE

&

SUSPECT TWO

CAUGHT AT BY INSPECTOR

LOCATION

NAME



*"My faith in the
policing of Edinburgh
has been restored"
says resident of
West Port.*



DISGRACED DR. FISHES AT LOCAL RIVER

*"I had no idea the bodies were
those robbed from graves and
mudered in cold blood! I am an
anatomist not a fortune teller"*
Dr. Knox tells our reporter

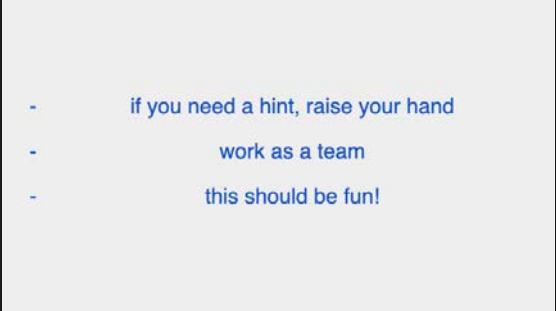
ROBERT KNOX is a Scottish anatomist and ethnologist. Born in Edinburgh, Scotland, Knox eventually partnered with anatomist and former teacher John Barclay and became a lecturer on anatomy in the city, where he introduced the theory of transcendental anatomy. However, Knox's incautious methods of obtaining cadavers for dissection before the passage of the Anatomy Act 1832 and disagreements with professional colleagues ruined his career in Scotland. Following these developments, he moved to London, though this did not revive his career. He was educated at the Royal High School of Edinburgh, where he was remembered as a 'bully' who thrashed his contemporaries "mentally and corporeally".

CONTINUED PG.13



certificate to fill out

presentation



what did we find?

let's discuss



unlock the box



what's the password?

let's discuss



gamebook 1.016.1028

Dear Detective Inspector,

Please excuse my impertinence in dealing with this case and the investigation, I have been investigating this case all day for nothing but the damned criminal has always the ability to be invisible, or I believe.

I am writing to inform you of several descriptions of the criminals you are searching for (possibly two):

- The suspects were around 20-26 years old
- One was blonde, the other brunette
- Jones believes he heard them speak Irish

This is all Jones remembers, I'm sorry he cannot remember for he being dead with in the proper manner.

Good luck with the police authorities, but regardless of Edinburgh's protection to protect on your success.

Commissioner
Edinburgh

- The suspects were around 20-26 years old
- One was blonde, the other brunette
- Jones believes he heard them speak Irish

CITY OF EDINBURGH CONSTABULARY		CITY OF EDINBURGH CONSTABULARY	
NAME	WILLIAM JONES	NAME	JAMES JONES
HEIGHT	5FT 11IN	HEIGHT	5FT 11IN
WEIGHT	160LB	WEIGHT	160LB
HAIR COLOR	BROWN	HAIR COLOR	BROWN
ACCENT	IRISH	ACCENT	IRISH
POSSIBLE	IRISH	POSSIBLE	IRISH

CITY OF EDINBURGH CONSTABULARY	
NAME	JAMES JONES
HEIGHT	5FT 11IN
WEIGHT	160LB
HAIR COLOR	BROWN
ACCENT	IRISH
POSSIBLE	IRISH

- The suspects were around 20-26 years old
- One was blonde, the other brunette
- Jones believes he heard them speak Irish

CITY OF EDINBURGH CONSTABULARY		CITY OF EDINBURGH CONSTABULARY	
NAME	WILLIAM JONES	NAME	JAMES JONES
HEIGHT	5FT 11IN	HEIGHT	5FT 11IN
WEIGHT	160LB	WEIGHT	160LB
HAIR COLOR	BROWN	HAIR COLOR	BROWN
ACCENT	IRISH	ACCENT	IRISH
POSSIBLE	IRISH	POSSIBLE	IRISH

- The suspects were around 20-26 years old
- One was blonde, the other brunette
- Jones believes he heard them speak Irish

who are the murderers?

let's discuss then write the answer on your newspaper!



gamebook 1.016.1028

URGENT

Dear Detective Inspector,

Well done on identifying Jones and then on the subject of these suspects, please accept my gratitude.

We have interesting a letter from the British to the House that perfectly their looking again, the only issue is that they have been with the House and the British to take out of the.

Jones and I have had a book of deciphering it, however Jones is a little bit of a mess and I am not sure if he is the one to do it.

It's up to you now detective, please the letter then go and catch Jones and then whatever they're hiding.

Proceed with caution, these men are dangerous.

Commissioner
Edinburgh



HARE & BURKE CAUGHT AT BY INSPECTOR



DISGRACED
FISHES AT
RIVER

1828
1905
1801

20-26-2
blond
brunette
William Hare
Thorn and



DISGRACED DR
FISHES AT LON



THE DAILY SCIENTIST

EST. 1798

FRIDAY 26TH NOVEMBER 1926

CAUGHT & BY INSPECTOR

W. Hare
Burke

NO. 569

"My faith in the
policing of Edinburgh
has been restored."
says resident of
West Port.



A	B	C
D	E	F
G	H	I

J	K	L
M	N	O
P	Q	R

U	S
V	T

Z	W
X	Y

L

TO MY PARTNER IN C
THE POLICE ARE ONTO US, WE N
HERE'S THE PLAN
WE START IN THE SOUTH AT T
m e a d o w s
THEN WE HEAD NORTH WEST TO
the
WE'LL NEED SUPPLIES, WE'LL GRAB THEM FROM
OUR GOOD FRIEND
AFTER WE'LL HEAD TO
WE'VE POKE
THEN BACK TO THE
THE GRAVEYARD WE'LL HIDE IN IS IN
the LOOKING
OF OUR ROUTE.

Start

EST. 1798

THE DAILY

mark
red
blue
green
black

reference list

Amuomo, N., Odoyo, C. O. (2020) 'Ethnography, Its Strengths, Weaknesses and Its Application in Information Technology and Communication as a Research Design', *Computer Science and Information Technology*, 8(2), pp. 50-56. Available at: <https://doi.org/10.13189/csit.2020.080203> (Accessed: 22/01/2024)

Asif Qureshi, M., Khaskheli, A., Ahmed Qureshi, J., Ali Raza, S., Qamar Yousufi, S. (2023) 'Factors affecting students' learning performance through collaborative learning and engagement', *Interactive Learning Environments*, 31(4), pp. 2371-2391. Available at: <https://doi.org/10.1080/10494820.2021.1884886> (Accessed: 22/01/2024)

Buchner, J., Rüter, M., Kerres, M. (2022) 'Learning with a digital escape room game: before or after instruction?', *Research and Practice in Technology Enhanced Learning*, 17(10). Available at: <https://doi.org/10.1186/s41039-022-00187-x> (Accessed: 22/01/2024)

Cleland, J. A. (2017) 'The qualitative orientation in medical education research', *Korean Journal of Medical Education*, 29(2), pp. 61 - 71. Available at: <https://doi.org/10.3946/kjme.2017.53> (Accessed: 22/01/2024)

Cornell University (2022) *Collaborative Learning*. Available at: <https://teaching.cornell.edu/teaching-resources/active-collaborative-learning/collaborative-learning> (Accessed: 22/01/2024)

Duncan, K. J. (2020) 'Examining the Effects of Immersive Game-Based Learning on Student Engagement and the Development of Collaboration, Communication, Creativity and Critical Thinking', *Tech Trends*, 64, pp. 514 - 524. Available at: <https://doi.org/10.1007/s11528-020-00500-9> (Accessed: 22/01/2024)

Egan, J. D., Banter, J. N., Sorgen, C. H. (2021) 'Assessing Escape Rooms as a Teaching Strategy for Leadership Competency Development', *Journal of Leadership Education*, 20(1), pp. 140 - 152. Available at: https://journalofleadershiped.org/jole_articles/assessing-escape-rooms-as-a-teaching-strategy-for-leadership-competency-development/ (Accessed: 22/01/2024)

The Glossary of Education Reform (2024) *21st century skills*. Available at: <https://www.edglossary.org/21st-century-skills/> (Accessed: 22/01/2024)

Grande-de-Prado, M., García-Martín, S., Baelo, R., Abella-García, V., (2021) 'Edu-Escape Rooms' *Encyclopedia*, 1(1), pp. 12 - 19. Available at: <https://doi.org/10.3390/encyclopedia1010004> (Accessed: 22/01/2024)

Hall, L.E. (2021) *Planning Your Escape: Strategy Secrets to Make You an Escape Room Superstar*. Simon & Schuster/Simon Element. ISBN: 9781982140342

Huang, S. Y., Kuo, Y. H., Chen, H. C. (2020) 'Applying digital escape rooms infused with science teaching in elementary school: Learning performance, learning motivation, and problem-solving ability', *Thinking Skills and Creativity*, 37, p.100681. <https://doi.org/10.1016/j.tsc.2020.100681> (Accessed: 22/01/2024)

Humphrey, K. (2017) 'The application of a serious, non-digital escape game learning experience in higher education.' *Sport & Exercise Psychology Review*, 13(2), pp. 48 - 54. Available at: <https://doi.org/10.1080/17477983.2017.1381111> (Accessed: 22/01/2024)

org/10.53841/bpssepr.2017.13.2.48 (Accessed: 22/01/2024)

Hunt-Gómez, C. I., Moreno-Fernández, O., Moreno-Crespo, P., Ferreras-Listán, M. (2020) 'Escape rooms' pedagogical potential from female future teacher's perspectives', *Journal of University Teaching and Learning Practice*, 17(5). Available at: <https://ro.uow.edu.au/jutlp/vol17/iss5/7> (Accessed: 22/01/2024)

IMDb (2024) *The Crystal Maze*. Available at: <https://www.imdb.com/title/tt0098774/> (Accessed: 22/01/2024)

Jiménez, C., Arís, N., Ruiz, A. A. M., Orcos, L. (2020) 'Digital Escape Room, Using Genial.Ly and A Breakout to Learn Algebra at Secondary Education Level in Spain', *Education Sciences*, 10(10), pp. 271. Available at: <https://doi.org/10.3390/educsci10100271> (Accessed: 22/01/2024)

Jones, T. L., Baxter, M. A. J., Khanduja, V. (2013) 'A quick guide to survey research', *The Annals of The Royal College of Surgeons of England*, 95(1), pp. 5-7. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3964639/> (Accessed: 22/01/2024)

Joynes, C., Rossignoli, S., Amonoo-Kuofi, E. F. (2019) '21st Century Skills: evidence of issues in definition, demand and delivery for development contexts', *K4D Helpdesk Report. Brighton, UK: Institute of Development Studies*. Available at: https://assets.publishing.service.gov.uk/media/5d71187ce5274a097c07b985/21st_century.pdf (Accessed: 22/01/2024)

Marcos, R. I. S., Fernández, V. L., González, M. T. D., Phillips-Silver, J. (2020) 'Promoting children's creative thinking through reading and writing in a cooperative learning classroom', *Thinking Skills and Creativity*, 36, pp. 100663. Available at: <https://doi.org/10.1016/j.tsc.2020.100663> (Accessed: 22/01/2024)

Main, P. (2022) *Fundamental Theories of Learning*. Available at: <https://www.structural-learning.com/post/fundamental-theories-of-learning> (Accessed: 22/01/2024)

Stohlmann, M. S. (2022) 'Mathematical digital escape rooms', *School Science and Mathematics*, 123(1), pp. 26 - 30. Available at: <https://doi.org/10.1111/ssm.12564> (Accessed: 22/01/2024)

Teraldsen, L. H., Haara, F. O., Lynse, M. S., Jensen, P. R., Jenssen, E. S. (2022) 'A review on use of escape rooms in education - touching the void', *Education Inquiry*, 13(2), pp. 162 - 184. Available at: <https://doi.org/10.1111/ssm.12564> (Accessed: 22/01/2024)

Tzima, S., Styliaras, G., Bassounas, A. (2021) 'Revealing Hidden Local Cultural Heritage through a Serious Escape Game in Outdoor Settings', *Virtual Reality Technologies and Applications for Cultural Heritage*, 21(01), pp. 10. Available at: <https://doi.org/10.3390/info12010010> (Accessed: 22/01/2024)


UK Government (2020) *Focus group study: qualitative studies*. Available at: <https://www.gov.uk/guidance/focus-group-study-qualitative-studies> (Accessed: 22/01/2024)

Usborne, S. (2019) 'Get me out of here! Why escape rooms have become a global craze', *The Guardian*, 1st April. Available at: <https://www.theguardian.com/games/2019/apr/01/get-out-how-escape-rooms-became-a-global-craze> (Accessed: 22/01/2024)

Wargo, J., Garcia, A. (2021) '(Re)reading the room: The literacies of escape rooms', *Journal of Curriculum and Pedagogy*, 20(1), pp. 14 - 39. Available at: <https://doi.org/10.1080/15505170.2021.1960224> (Accessed: 22/01/2024)

Yacek, D. W., Gary, K. (2022) 'The uses and abuses of boredom in the classroom', *British Educational Research Journal*, 49(1), pp. 126-141. Available at: <https://doi.org/10.1002/berj.3833> (Accessed: 22/01/2024)

consent form

Edinburgh Napier UNIVERSITY 

School of Arts & Creative Industries
Merchiston Campus
10 Colinton Road
Edinburgh EH10 5DT
United Kingdom

Design Research Portfolio – Educational Escape Rooms

Informed Consent Form (to be completed after the Participant Information Sheet has been read)

Investigators Details:

Sam Vettese, School of Arts and Creative Industries, Edinburgh Napier University,
Merchiston Campus, 10 Colinton Road, EH10 5DT
s.vettese@napier.ac.uk

Dr Matt Sinclair, School of Arts and Creative Industries, Edinburgh Napier University,
Merchiston Campus, 10 Colinton Road, EH10 5DT
m.sinclair1@napier.ac.uk

Josie Wall, School of Arts and Creative Industries, Edinburgh Napier University,
Merchiston Campus, 10 Colinton Road, EH10 5DT
40490903@live.napier.ac.uk

Taking Part

Please initial to confirm agreement

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the project's supervisors in accordance with the Edinburgh Napier University Code of Practice on Research Integrity

I have read and understood the information sheet and this consent form

I have had an opportunity to ask questions about my participation

I understand that taking part in the project will involve talking about my experiences and giving my opinions on ideas for new products, apps or services, and that this might include being photographed, interviewed and recorded (audio or video)

Edinburgh Napier University is a registered Scottish charity Reg. No. SC018373

napier.ac.uk

I understand that I am under no obligation to take part in the study, have the right to withdraw from this study at any stage for any reason, and will not be required to explain my reasons for withdrawing



Use of Information

Please initial to confirm agreement

I understand that all the personal information I provide will be processed in accordance with data protection legislation on the public task basis and will be treated in strict confidence unless (under the statutory obligations of the agencies which the researchers are working with), it is judged that confidentiality will have to be breached for the safety of the participant or others or for audit by regulatory authorities.



I understand that information I provide will be used for publications, reports, web pages, and research outputs



I understand that personal information collected about me that can identify me, such as my name or where I live, will not be shared beyond the study team.



I agree that my image may be used in reports or presentations, provided these are not made public or shared beyond the study team and staff tutors.



I agree that information I provide can be quoted anonymously in research outputs.



