

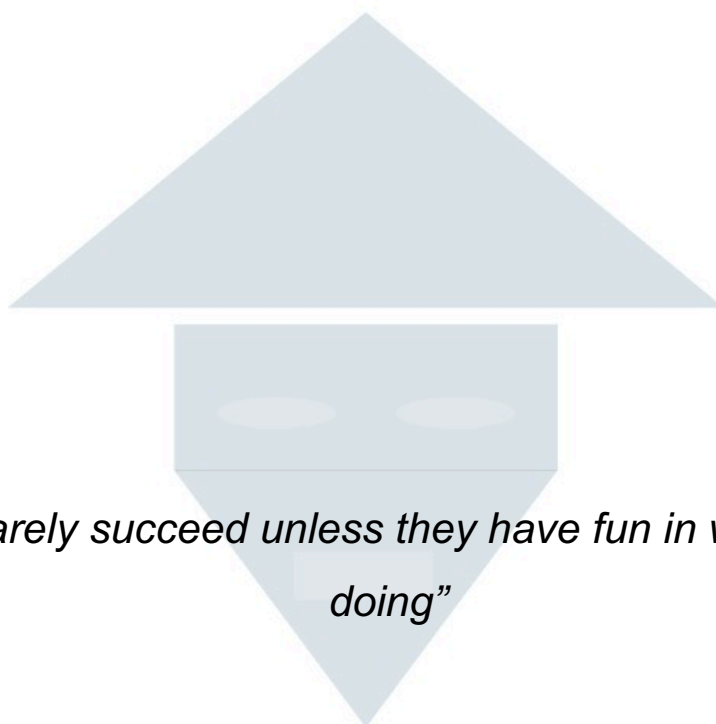


NEET-SYSTEM

Handbook for Training
Professionals to the
Use of Digital Escape
Room Games in
Educational Settings

NEET SYSTEM

Online Educational Escape Rooms to
Re-engage ESLs and NEETs



“People rarely succeed unless they have fun in what they are doing”

Dale Carnegie

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Table of Contents

Summary	3
Escape Room Games: An Introduction	4
Educational Games in the Digital Era	4
Escape Room Games' Definitions	6
Escape Room Games' Characteristics	7
Escape Room Games: Instructional Considerations	10
The Methodology for creating Escape Room Games	11
NEET-SYSTEM Escape Room Challenges	13
Using Google Forms and Google Sites as Tools for Creating Escape Room Challenges	13
NEET-SYSTEM Escape Room Challenges	20
References.....	22
Useful resources	23

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Summary

The aim of this Handbook is to train professionals working in the field of adult education so to be able to harness the potential of digital Escape Room Games in educational settings. Specifically, this Handbook can serve as a guide for the creation and use of digital Escape Room Games in educational contexts by placing emphasis on the teaching methodology and the instructional considerations during their design. Also, the Handbook includes a step by step guide on how to create Escape Room Games using the Google Forms software and a specific part of the Handbook is dedicated to the presentation of the escape room games that were developed during the implementation of the NEET-SYSTEM project. Specifically, after studying this Handbook professionals will be able to:

- describe the concept of a game;
- distinguish between games and escape room games;
- recognize the value of games in educational settings in the digital era;
- list the principles of game-based learning;
- apply game-based learning principles to create their own escape room games;
- use the NEET-SYSTEM escape room games to their teaching practices;
- transform their teaching practices by developing fun, challenging and creative digital games.

Harnessing the potential of digital escape room games that are available can have a major impact on the accessibility and viability of adult education provision. In this regard, through this Handbook we aspire to provide a useful tool for adult educators working with NEETs so to help the NEET target group members develop selected key competences that are highly valued in the European labour market in each partner country.

Escape Room Games: An Introduction

Educational Games in the Digital Era

The effect games have on society has a rich and fascinating history as the paradigm of adopting games in some form can be traced back to the earliest civilizations existed hundred thousand years ago; from board games that have been played in Egypt at 3500 BC (Clark et al., 2016) to the games played among the Indigenous Australians (Edwards, 2009). Referring to the current century, according to Clark et al. (2016) nowadays *“there is a rapid growing interest and demand globally, for developing and participating in live, interactive gaming experiences otherwise known as Escape Rooms”* (p. 968). According to Borrego, Fernández, Blanes, and Robles (2017) *“Room Escapes (or Real Escape Games) were firstly used in Japan in 2007, and grew rapidly in 2012-13; expanding first in Asia (starting in Singapur), afterwards in Europe (starting in Hungary), and then in Australia and North-America”* (p. 163).

Before we start the discussion about the use of Escape Room Games in education, it is important to first consider the term *game*. A general definition of a game is given by (Schell, 2008) as follows: *“a game is a problem-solving activity, approached with a playful attitude”* (p. 37). At this point, it is worth noting that the term game in the modern era has evolved since the engagement of people with traditional games which have emerged since antiquity, and has played a key role in the context and evolution of life and societies on Earth. In detail, during the 21st century, the concept of play, due to the rapid technological advancements, has taken on another importance in the rise of the digital revolution (Clarke et al., 2017).

In particular, the onset of the digital revolution brought with it computer-based technologies, such as video games and simulations that are being openly available to a large proportion of the human population (Clarke et al., 2017). Shifting from games in general to computer games, one of the biggest differences that we can spot is that computers enhance the *“play experience”* which is what people want most out of games (Prensky, 2001, p. 18).

Some of the reasons why people find computer games attractive and satisfying may be the following: a) they are typically faster and more responsive, b) they can simulate the physics of shooting in space, or combining all the factors in

flying an airplane, or considering the millions of possibilities in puzzles or strategic contests, c) they are capable of more, better and far more varied graphic representation, and d) gamers can play at different levels of challenge and e) they can generate and allow huge numbers of options and scenarios (Prensky, 2001, p. 5).

Denning et al. (2013) suggest that “*games are intended to have intrinsic entertainment value, which gets people to pick them up and use them on their own time*” (p. 2). According to Prensky (2001) computer and videogames are potentially the most engaging entertainment in the history of mankind due to a combination of twelve elements which he summarizes as follows:

1. Games are a form of fun. That gives us enjoyment and pleasure.
2. Games are form of play. That gives us intense and passionate involvement.
3. Games have rules. That gives us structure.
4. Games have goals. That gives us motivation.
5. Games are interactive. That gives us doing.
6. Games are adaptive. That gives us flow.
7. Games have outcomes and feedback. That gives us learning.
8. Games have win states. That gives us ego gratification.
9. Games have conflict/competition/challenge/opposition. That gives us adrenaline.
10. Games have problem solving. That sparks our creativity.
11. Games have interaction. That gives us social groups.
12. Games have representation and story. That gives us emotion (p. 1).

All the above reasons can be considered as a very strong indication that games can play a vital role in the field of education. Specifically, Tang & Hanneghan (2015) provide a definition of an educational game which can be described as follows: “*educational game also known as instructional game takes advantage of gaming principles to gamify technologies in order to create engaging educational content*” (p. 594). They also state that educational games are “*a viable alternative to existing computer-aided learning technologies that can assist in persuading and encouraging digital natives to acquire knowledge*” (p. 581).

The use of games or gamification for enhancing the teaching and learning processes so to have a positive impact on student’s learning is an approach which

has recently started being referred to as game-based learning (GBL) (Clarke et al., 2017). The introduction of the term GBL in educational research has started to appear strongly connected to digital technologies since the early 2000s when Prensky (2001) suggested the term *Digital Game-Based Learning*, which influenced the way in which the academic community “*worked upon, developed and perceived the required conditions of GBL, particularly in relation to the requirement of technology*” (Clarke et al., 2017, p.74).

Tang, Hanneghan and Rhalibi (2009) offer a definition of GBL which follows a digitally oriented perspective: “*Games-based learning takes advantage of gaming technologies to create a fun, motivating, and interactive virtual learning environment that promotes situated experiential learning* (p.1). Also, Clarke et al. (2017) suggest that game-based learning is an approach which refers to “*the paradigm of adopting games and play as systems for representing and simulating real-life conditions, imparting knowledge and moral teachings, and generally nurturing social evolution*” (p. 73).

Escape Room Games' Definitions

The Escape Room Games which have only recently been introduced to the wider public across the globe have won the interest and attention of young people. Whether playing in a physical space or in an electronic environment, Escape Room Games offer fun, enhance critical and creative thinking and promote teamwork. In recent years, research has documented the use of Escape Room Games in educational environments because of the large number of possibilities they offer to support the learning process (Borrego, Fernández, Blanes, & Robles, 2017; Snyder, 2018). As López-Pernas, Gordillo, Barra, & Quemada (2019) suggest: “*in addition to being a well-liked form of recreation, escape rooms have drawn the interest of educators due to their ability to foster valuable skills such as teamwork, leadership, creative thinking, and communication*” (p. 31723).

If we want to provide a general definition of the term *escape room* we can state that it is used to describe the process during which a group of people must escape from a room that includes a number of challenges usually within a specific time limit. In this context, in order for the players, to win, which means to be able to 'escape', they will have to solve the above challenges that exist inside the room

(Wiemker, Elumir & Clare, 2015, p. 2). According to Nicholson's (2015) definition, 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"* (p. 45). Especially for the Digital Escape Room Games which include solving a series of clues to unlock locks using online software there is no need for equipment as in physical Escape Room Games. All that is necessary is a device connected to the Internet.

Escape rooms can also be used in educational contexts as they can be developed in a course-oriented way and incorporate puzzle challenges in such a way so that students can solve the challenges while utilizing the knowledge and skills from the course material (López-Pernas, Gordillo, Barra, & Quemada, 2019). In this way, learning can become a less boring and more creative process.

Escape Room Games' Characteristics

Escape rooms offer experiential learning and attract the interest of players looking for a non-traditional game (Wiemker, Elumir & Clare, 2015). One of the main distinguished characteristics of the Escape Room Games lies in the relationship between the player and the avatar. Specifically, unlike the digital games where there is a separation between the player and the avatar in the game world, in escape room games the player and the avatar are the same (Nicholson, p. 1).

Drawing from Salen and Zimmerman's views on game design from their book "Rules of Play", one of the most important concepts in making a successful game lies in the *Meaningful Play* (2004). In this regard, in order for a player to be engaged in meaningful game activities the actions of the player need to be **discernable** which means that the player understands the result of what he/she is doing, and **integrated** which means that each action of the player makes a difference in the game plot. In the context of escape room games meaningful play means that the challenges that will be created and the tasks *"are not simply there to be barriers to winning the game, but each challenge has a purpose and is tied into the larger narrative, giving the player a way to find meaning in their actions"* (Nicholson, 2015, p. 6). In order for game designers to create more meaningful escape room games they should take into account the following principles.

1. Connection of the player to the narrative

The first way that challenges can be made meaningful is by initiating the player into the context of the game (Howard, 2008). Specifically, if the game doesn't create a deeply engagement of the player to the game setting already from the beginning then the player can be forgetful of the role he/she is supposed to be taking. In this regard, the game narrative needs to provide a balance between the narrative and the meaning of the game in order to promote the active participation and interest of the player (Nicholson, 2015, p. 7). Additionally, research on the design of escape room games shows that there are many escape rooms which “consist of challenges that don't make sense in the genre, the settings, or the world in which the game is placed” (Nicholson, 2015, p.2). In order to avoid the player's disengagement, escape room game designers can follow Lee Sheldon's advice (in Nicholson, 2016) on the three things that audiences want from storytellers:

- Take me to a place I have never been.
- Make me into someone I could never be.
- Let me do things I could never do (p. 5)

2. Consistency in the escape room narrative

During an Escape Room Game, the player comes across a series of challenges which are connected to the game narrative, the game setting and the actions of the player. However, if there is no consistency of the above with the escape room game, it will cause a mental disengagement of the player. Many times, inconsistencies as such exist because the designer of the game simply never stepped back and asked “*Why would this exist?*” (Nicholson, 2016, p. 9).

Specifically, escape room games prompt players to engage in thinking process while solving a puzzle. This process requires from individuals to work on the puzzles using multiple approaches to knowledge (Wiemker, Elumir, & Clare, 2015). In order to achieve the player's understanding of each puzzle there is a need to provide good scripts so to avoid misunderstandings and disappointment in the process of solving a puzzle. For this reason, players need to be provided with useful hints that reveal suggested thinking actions for reaching a solution.

According to Schell (2008), a key design strategy is keeping the backstory simple so that players can better understand how the challenges fit within the narrative and the game setting. It is extremely important for designers to understand that during a short period of play, the escape room players don't have the time to explore an in-depth backstory. For this reason, Sheldon (2014) proposes that *“the best solution is to reveal backstory through exposition brought to light during the action of an ongoing story”* (p. 198).

When the backstory is partly exposed to players through the game challenges, then the story content can be presented in small pieces instead of placing lengthy story texts during the pre-game narrative. Specifically, by placing short story texts as part of the challenges, while it may seem from the designer's point of view that he/she will be trapped into creating linear escape rooms, the player can understand the game setting without being overwhelmed with lots of information at once (Nicholson, 2015, p. 6).

3. Create meaningful puzzles

An Escape Room can be comprised from a series of puzzles. These puzzles are usually presented in sequence. The sequential appearance of puzzles in escape rooms is often easier to design and has many advantages in regards to the player experience. Specifically, one advantage is that it requires less guidance, thus making it simpler for students to progress while another advantage is that it allows the educators to track the players' activity in a more simple and accurate way since the progress and performance of all students can be measured more easily (López-Pernas, Gordillo, Barra, & Quemada, 2019).

When creating each puzzle, game designers should carefully connect the puzzle to the theme of the room and provide information so to be understandable by the players in the context of the game setting. At its core, an escape room puzzle uses a simple game loop:

1. A Challenge to overcome
2. A Solution (may be concealed)
3. A Reward for overcoming the challenge (Wiemker, Elumir & Clare, 2015, p. 4).

In order to create meaningful puzzles the designers should take into account the criteria for a 'good' puzzle. While these criteria may be subjective, Wiemker, Elumir and Clare (2015) propose some criteria in the form of questions for evaluating puzzles in terms of design elements which are the following:

- Is the puzzle integrated into the storyline?
- Are the clues to the puzzle logical?
- Can the puzzle be solved using only the information within the room?
- Does the puzzle add to the atmosphere to the room? (p. 4)

If a designer answers yes to all of the above then he/she has probably created a good puzzle. It is important that for the puzzles to follow the twists of the game and be a part of the greater whole of the game experience (Wiemker, Elumir & Clare, 2015).

Escape Room Games: Instructional Considerations

Richard Van Eck (2006) in a very detailed article on Digital Game-Based Learning suggests that by giving the impression that only games can be effective in learning one can get the idea that all games are good for all learners at all ages and for all learning outcomes which can be misleading. He proposes that games that target to enhance the learning experience should be based on well-established learning principles, theories and models (p. 2-3).

On the same note, Clarke at al. (2017) argue that Game-Based Learning should draw from the adoption of various technologies and digital gaming preferences as a means to produce rich educational experiences and explore techniques of maintaining motivation and engagement, often at the detriment of different materials, approaches and pedagogies (p. 74).

Nicholson (2016) suggests that during the design of an Escape the Room Game one of the basic principle the designer can follow is the concept of "*Asking Why*". Specifically, during the process of "asking why" the designer should reflect on the value of each element of the player experience by asking "Why is this here?". Moreover, Nicholson (2016) advices game designers to know exactly the reason why each puzzle, task, and item in the escape room has been placed in a specific

position so to be consistent with the overall concepts behind the design of the room (Nicholson, 2016).

Additionally, apart from the position of each element of the player experience in the escape room challenges another important consideration that needs to be taken into account according to Tang and Hanneghan (2015) is the fact that educational games need to be designed with “*pedagogically sound theories so to encourage further learning when disconnected from the virtual environment*” (p. 581).

The Methodology for creating Escape Room Games

According to Heikkinen and Shumeyko (2016) an escape room “*no matter whether it has an overarching theme and narrative or is devoid of them, it cannot happen without the presence of puzzles, which are essentially the backbone of the game*” (p. 7). They share Clare’s definition of an escape room puzzle as “*any challenge, which requires using mental effort to logically solve a problem*” (Heikkinen & Shumeyko, 2016, p. 7).

According to Nicholson (2016) a good design for puzzles that are valuable in exploring the world and narrative should follow some basic principles which are summarized below:

- *A puzzle is made of a number of elements, and at least one of these elements from each puzzle should lead to a meaningful engagement for a player.*
- *The resources that are used in solving the puzzle could come from the world in which the game is set.*
- *The strategies needed to solve the puzzle could map to something in the narrative of the game.*
- *The solution can be part of the quest that the players are working toward, and,*
- *The existence of the puzzle in the game needs to make sense from the perspective of the genre, the setting, and the narrative (p. 12).*

Additionally, another important aspect of puzzles is that they need to have a clear solution (Selinker & Snyder, 2013). Specifically, one common problem that has been found in many escape room puzzles is that they lead to ambiguous solutions, and thus the player tries a number of different ways for unlocking the combination lock in an attempt to find the answer (Nicholson, 2016). In order to avoid ambiguity and

enhance the player's engagement during the solution of a puzzle the designer needs to balance the requirement for effort and inspiration to solve. As Selinker and Snyder (2013) put it: *“too much effort, and the puzzle is busywork. Too much inspiration, and the puzzle is a guessing game. Right in the middle, and the puzzle is worth my time”* (p. 7). Also, the solution to one puzzle should lead to something else – it may be a code for a padlock, the starting key for another puzzle, a door that opens to another room, a piece for a meta-puzzle, or it may be a red herring (Nicholson, 2015, p. 2).

Another important aspect of puzzle creation is motivation. Specifically, in order for players to be fully engaged in the game they need to be motivated to solve the puzzles. Some guiding principles in designing motivation in educational games are the following:

- Complex activities designed should be made of smaller, achievable tasks to guide learners in achieving the main objective.
- The story and narrative used should be closely related to common cases in real world (Tang & Hanneghan, 2015, p. 581).

Lastly, another essential element during puzzle design is to prevent players from getting stuck at one puzzle for too long. Otherwise, players are likely to get bored, frustrated or even angry. From a pedagogical point of view this may result to low player engagement and to the minimization of the number of attempts of solving all the puzzles. In order to deal with this issue, educational escape rooms should provide hints on demand when players get stuck or when designers consider it appropriate (López-Pernas, Gordillo, Barra, & Quemada, 2019).

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NEET-SYSTEM Escape Room Challenges

Using Google Forms and Google Sites as Tools for Creating Escape Room Challenges

Google Forms

Google Forms is a tool which allows collecting information from users via a personalized survey or quiz. A Google form can be filled out by anyone who has obtained a link to it. The information is then collected and automatically connected to a spreadsheet. When the user creates a Google Form, it's saved in Google Drive and can be accessed directly from there.

Google forms have been chosen as the designated tool for the purposes of this project due to their unique features, the most important ones being:

- intelligent response validation – ability of the algorithm to determine the correctness of the answer
- variety of question types which can be used (described in more detail below)
- variety of features which can be edited, added and formatted including text, images or video
- potential for creating content in a simple form and in a particular sequence which are the main features to be achieved in a digital escape room challenge
- option of collecting e-mail addresses of the respondents
- the content can be easily edited, duplicated, reordered and deleted, making it an ideal tool with a mild learning curve which can be used by anyone and does not require advanced ICT competence
- the content can be easily shared with a wide audience.

A Brief User Guide to Google Forms

Step 1: Set up a new form or quiz

1. Go to forms.google.com.
2. Click Blank.
3. A new form will open.

Step 2: Edit and format a form or quiz

Adding sections, questions, images or videos

Adding a section

Sections can make your form easier to read and complete.

1. In Google Forms, open a form.
2. Click Add Section.
3. Name the new section.

Add a question

1. In Google Forms, open a form.
2. Click Add.
3. To the right of the question title, choose the type of question you want.
4. Type the possible responses to your question. To prevent people from not answering, turn on Required.

Add an image or video

You can add an image to a question or on its own.

1. In [Google Forms](https://forms.google.com), open a form.
2. Click a question or answer.
3. To the right, click Add image.
4. Upload or choose an image.
5. Click **Select**.
6. To add an image, click Add image. To add a video, click Add Video.

7. Choose your image or video and click Select.

Duplicating a question, image, or section

Questions or images

1. Click a question or image.
2. Click Duplicate.

Sections

1. Click a section header.
2. Click More.
3. Click **Duplicate section**.

Step 3: Sharing a form

- Per email: Open a form, in the top right, click Send. Add the email addresses you want to send the form to, along with the email subject and message.
- Sharing a link: Open a form, in the top right, click Send. At the top of the window, click Link.
- Sharing a form on social media: Open a form, in the top right, click Send. At the top right, choose Google+, Twitter, or Facebook.
- Embed a form on a website or blog: At the top of the window, click Embed.

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Creating an Escape Room Challenge in Google Forms

1. Choosing an area of competence to be developed

The first important step in creating a digital escape room is deciding on the area of competence the game will be focusing on. For instance, the games which are the outcome of this project represent tools for developing cultural awareness, sense of initiative, digital competence etc.

2. Setting the scene

Choosing an appropriate topic and setting of the game is an equally important step. Finding the right setting and creating an attractive, consistent and credible backstory is essential for getting the attention of the recipients as well as actively involving them in game-based learning and keeping them motivated throughout the challenge. Within Google Forms, the idea of setting can be enhanced by adding a suitable title image, text in form of instructions or using second person singular – the “you” perspective.

3. Adapting the tasks to the required competence level

When creating the individual tasks, it is necessary to keep the competence level of the target audience in mind. In this way, we can make sure the learners do not experience frustration resulting from unnecessarily excessive level of difficulty and keep trying to tackle the challenge while perceiving it as an enjoyable and positive learning experience. This is particularly vital when creating learning activities focusing on the NEET target group.

4. Formulating tasks/puzzles

The next step is creating the individual tasks or puzzles which make up the challenge on a particular level. The key here is to remain within the previously created scenario and to keep the narrative brief but comprehensible and credible, so that the player does not lose connection to the backstory at any point of the game. Also, the puzzles must be meaningful and adapted to the given competence level.

Google Forms offers a wide variety answer types such as short answer, paragraph, multiple choice or checkboxes, with the first two being ideal features of a digital escape room challenge:

- short answer: the player types in an answer in few words. In terms of learning outcomes of this project, the preferred kind of answer is a single word or several words written in capitals, a number or a combination of digits. It is therefore necessary to formulate the question accordingly. The key to creating a digital challenge is using the intelligent response validation which allows the player to proceed to the next section/questions after having typed in the correct answer. There is also an option of giving a hint (error text) that appears automatically once the player has typed in a wrong answer. Using this option can be considered in case of questions where the author of the challenge expects the learner to struggle.
- paragraph: this type of answer promotes independent thinking and is suitable in cases when the educator wants the learner to express his or her opinion. Open answer questions can also be used to initiate a group discussion or to make the group arrive to a collective conclusion, which encourages teamwork and develops debating skills. As there is no right or wrong answer to questions like these, response validation is not applicable.

The educational content of the questions can vary from puzzle to puzzle. The key to creating meaningful puzzles are logic, structure and creativity. They must be designed with the aim to educate as well as entertain the learner and lead to a single solution.

Some of the puzzle types used in the learning outcomes of this project are as follows:

- mathematical puzzles: traditional math problems (e.g. “find the value of xyz”), a narrative puzzle with the application of mathematics or puzzles based on finding a pattern in a row of numbers.
- logic puzzles: examples of these are Sudoku, Picross or logic grid puzzles which can be made easier by partially filling out the puzzle for the solver. Alternative writing systems (Morse Code, Arabic, Cyrillic or Braille alphabet),

artificial languages (Esperanto) or modified spellings (Leetspeak) are also a popular choice in escape rooms and similar game types.

- cryptic puzzles: are the most common type of puzzles found in escape rooms. The solution is to be found using a clue but the mechanics of utilizing it are vague or subtle and open to interpretation by the player.
- word puzzles: require knowledge of a language and can include crosswords, riddles or wordplays.
- lateral thinking puzzles: are strange situations in which the player is given a little information and then has to find the explanation. While trying to solve this kind of puzzles, the learner needs to check his or her assumptions, be open-minded, flexible and creative, putting together several pieces of information at once.

The digital escape room challenges which constitute the outcomes of this project use different methods of providing the clues:

- images: can represent an object in question, hide a clue or suggest the solution to the problem.
- videos: can include a keyword or a number that is the answer to the question while providing a learning experience on a certain topic by making the player watch the whole video to uncover a single piece of information or trivia.
- embedded links to websites or files: have a vast potential of developing ICT skills by requiring the player to work with different file types (Microsoft Word, Microsoft Excel, Microsoft PowerPoint) which cannot be used in Google Forms directly.
- QR codes: are a type of a barcode which contains information. A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device. For the purposes of creating digital escape rooms, QR codes can be created using a QR code generator and must be scanned by the learner's smartphone to lead him or her to a target location (website).
- Google Maps: is a useful tool to enhance basic ICT skills and logical thinking of the learner by recognizing coordinates or using the application to find a particular location.

5. Formulating a conclusion

A successful completion of an escape room challenge traditionally includes opening a locked door i.e. escaping an actual room/prison but may also include anything from finding a hidden object or person to a successful ending to a treasure hunt.

Apart from an intrinsic motivation resulting from achieving a proposed goal, successful completion of digital escape room challenges constituting this project leads to the learner being awarded a learning badge. A learning badge represents a formal reward and recognition of a skill or competence at a certain level. The badges collected within individual challenges can be further used to demonstrate the learning progress in a particular area of competence.

6. Collecting data

Within Google Forms, the author of a digital escape room challenge is able to collect provided data, i.e. obtain e-mail addresses as well as receive and review responses from all participants, either individually as a summary or download them in a spreadsheet format. That way, the educator is able to get immediate feedback about the performance of all learners, particularly responses to open answer questions.

Using Google Sites to Create Escape Room Challenges

Similarly to Google Forms, the Google Sites can be used to create digital escape room challenges in terms of this project. It is a structured web-creating tool offered by Google which enables anyone to create simple websites, allowing collaboration between different editors.

For the purposes of this project, Google Sites can be used to integrate questions created in Google Forms while giving the educator more space for customizing the theme, background, setting etc.

NEET-SYSTEM Escape Room Challenges

NEET-SYSTEM Escape Room Challenges which represent the learning outcomes of this project focus on development of the following areas of competence:

1. Cultural Awareness and Expression
2. Sense of Initiative and Entrepreneurship
3. Social and Civic Competence
4. Digital Competence

For each of these competence areas, two sets of escape rooms have been created, each of them taking place in a different setting to engage the learner in.

Each of the challenges contains four levels of expertise:

1. Introductory 2 puzzles
2. Intermediate 3 puzzles
3. Advanced 4 puzzles
4. Expert 5 puzzles

CHALLENGE NUMBER	COMPETENCE AREA	SETTING	LEVEL
1	<i>Cultural Awareness and Expression</i>	Abandoned Ship	Introductory
			Intermediate
			Advanced
			Expert
2		A Trip to Mars	Introductory
			Intermediate
			Advanced
			Expert
3	<i>Sense of Initiative and Entrepreneurship</i>	Mafia Escape Room	Introductory
			Intermediate
			Advanced
			Expert

4		Spy Game	Introductory
			Intermediate
			Advanced
			Expert
5	<i>Social and Civic Competence</i>	Power Outage Escape Room	Introductory
			Intermediate
			Advanced
6		Elections Escape Room	Expert
			Introductory
			Intermediate
7	<i>Digital Competence</i>	Disruption in a Server Room	Advanced
			Expert
			Introductory
			Intermediate
8			Advanced
			Expert

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References

Borrego, C., Fernández, C., Blanes, I., & Robles, S. (2017). Room escape at class: Escape games activities to facilitate the motivation and learning in computer science. *JOTSE*, 7(2), 162-171.

Clarke, S., Peel, D., Arnab, S., Morini, L., Keegan, H. & Wood, O. (2017). EscapED: A Framework for Creating Educational Escape Rooms and Interactive Games to For Higher/Further Education. *International Journal of Serious Games*, 4 (3), 73-86.

Clarke, S., Arnab, S., Morini, L., Wood, O., Green, K., Masters, A., & Bourazeri, A. (2016, October). EscapED: A framework for creating live-action, interactive games for higher/further education learning and soft skills development. Available at: <https://pureportal.coventry.ac.uk/files/11916604/escapedcomb.pdf>

Denning, T., Lerner, A., Shostack, A., & Kohno, T. (2013). *Control-Alt-Hack: the design and evaluation of a card game for computer security awareness and education*. Available at: <https://tamaradenning.net/files/papers/ccs479-denning.pdf>

Edwards, K. (2009). Traditional games of a timeless land: Play cultures in Aboriginal and Torres Strait Islander communities. *Australian Aboriginal Studies*, (2), 32.

Heikkinen, O., & Shumeyko, J. (2016). *Designing an escape room with the experience pyramid model*. Available at: <https://core.ac.uk/download/pdf/45600683.pdf>

Howard, J. (2008). *Quests: Design, theory, and history in games and narratives*. Available at: <https://content.taylorfrancis.com/books/download?dac=C2010-0-47512-0&isbn=9781439880814&format=googlePreviewPdf>

López-Pernas, S., Gordillo, A., Barra, E., & Quemada, J. (2019). Examining the Use of an Educational Escape Room for Teaching Programming in a Higher Education Setting. Available at: <https://ieeexplore.ieee.org/jiel7/6287639/8600701/08658086.pdf>

Nicholson, S. (2016). *Ask Why: Creating a Better Player Experience Through Environmental Storytelling and Consistency in Escape Room Design*. Available at <http://scottnicholson.com/pubs/askwhy.pdf>

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

Prensky, M. (2001). *Fun, Play and Games: What Makes Games Engaging Useful Resources*. Available at: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjVsc7zqLPhAhUHxoUKHRE3AvkQFjAAegQIBRAC&url=http%3A%2F%2Fwww.marcprensky.com%2Fwriting%2FPrensky%2520-%2520Digital%2520Game-Based%2520Learning-Ch5.pdf&usg=AOvVaw03z1bVuxUfxRtafyplCnwe>

Salen, K. & Zimmerman, E. (2004). *Rules of Play: Game Design Fundamentals* [Google Books version]. Retrieved from: https://books.google.com.cy/books?hl=en&lr=&id=UM-xyczrZuQC&oi=fnd&pg=PP13&dq=salen+zimmerman+meaningful+play&ots=2BHIAYeHZw&sig=HNtkW3XSfkKckGbmHJePrDcYFU&redir_esc=y#v=onepage&q=salen%20zimmerman%20meaningful%20play&f=false

Schell, J. (2008). *The Art of Game Design: A book of lenses*. Available at: <http://www.aisacademics.com/wp-content/uploads/2017/07/GAD101-Introduction-to-Game-Development.pdf>

Selinker, M., & Snyder, T. (2013). *Puzzle Craft: The Ultimate Guide on how to Construct Every Kind of Puzzle*. Puzzlewright Press.

Tang, S. & Hanneghan, M. (2015). Designing Educational Games: A Pedagogical Approach, *IGI Global*, 181-198. doi: 10.4018/978-1-61520-781-7.ch008.

Tang, S., Hanneghan, M., & El Rhalibi, A. (2009). Introduction to games-based learning. Available at: <http://biblio.uabcs.mx/html/libros/pdf/9/c1.pdf>

Van Eck, R. (2006). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE review*, 41(2), 16.

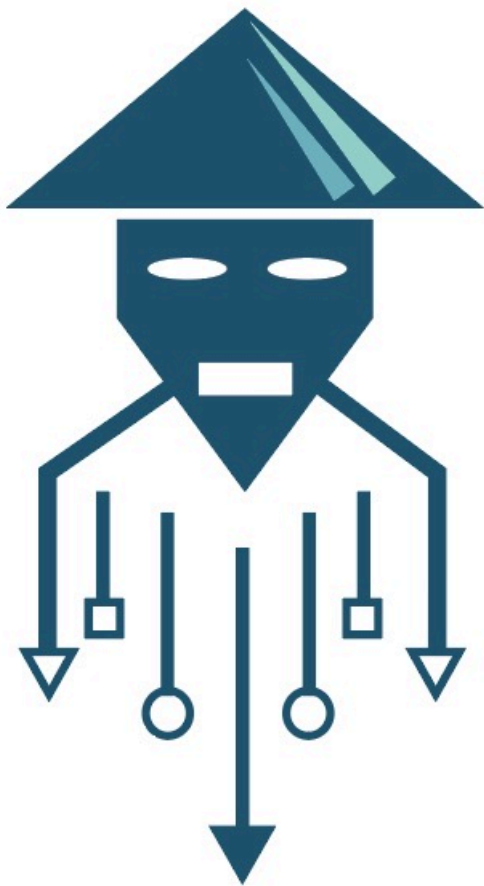
Wiemker, M., Elumir, E., & Clare, A. (2015). *Escape room games: Can you transform an unpleasant situation into a pleasant one?*. Available at: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwiVurKYn7HhAhULNBQKHSraBOgQFjAAegQIBBAC&url=https%3A%2F%2Fthecodex.ca%2Fwp-content%2Fuploads%2F2016%2F08%2F00511Wiemker-et-al-Paper-Escape-Room-Games.pdf&usq=AOvVaw3gJRMjw90mMO9gyZIsXaoq>

Useful resources

Mastering the Digital Escape. Learn how to create digital puzzles for your students. Available at: <https://www.smores.com/cvf4p-digital-escapes>

13 Rules for Escape Room Puzzle Design. Available at: <https://thecodex.ca/13-rules-for-escape-room-puzzle-design/>

Digital Breakouts: Users Guide. Available at: <https://sites.google.com/edtechcreative.com/digital-breakouts-guide/home>



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