EscapED: A Framework for Creating Live-Action, Interactive Games for Higher/Further Education Learning and Soft Skills Development

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Abstract: There is a rapid growing interest and demand globally, for developing and participating in live, interactive gaming experiences otherwise known as Escape Rooms. Traditionally designed to provide entertainment, Escape Rooms require its players to solve puzzles, complete tasks and work together efficiently to complete an overall goal such as solving a mystery or escaping a room. The structure of Escape Rooms and their overall growing popularity, indicates that the premise of interactive, live-action gaming may be adapted to develop engaging scenarios for game-based learning. The authors present; EscapED, as a work in progress, case study and paradigm for creating educational Escape Rooms and Interactive Gaming Experiences. A focus is drawn to designing and developing on-site experiences, to provide engaging alternatives for learning and soft skills development amongst higher education staff and students. A review of a prototype trial, developed to support a Coventry University staff training event is given, alongside participant's general feedback and reactions to the experience and the perceived educational value of EscapED. The work in progress EscapED framework is presented as a tool to help foster a best practice approach to develop Interactive Game-Based Learning Experiences.

Keywords: Educational escape rooms, game-based learning, role-play, interactive games, live-action gaming

1. Background

The paradigm of adopting games and play as systems for representing real-life conditions, imparting knowledge and moral teachings, and generally nurturing social evolution, now referred to as game-based learning (GBL), has existed for thousands of years. Evidence of early board games, date back to the Predynastic burial tombs in Egypt, c. 3500 BC, where examinations of ancient burial frescos have revealed the oldest known game to man; Senet (Piccione, 1980). The identification of Senet and other early examples of board games, found in various cultures and societies throughout history, emphasizes the fascination and value that humankind has had, and continues to have regarding the nature of games and play, so much so, that they are deeply embedded into our history as a civilization (Parlett, 1999). Equally so, the significance of play for learning can be exhibited throughout the animal kingdom with one particular given example; 'social play' (Bekoff & Allen, 1998), that is used by most living mammals for developing practical skills and experiences needed for later adult life. However, the landscape of games and play would change forever with the rise of the Digital Revolution.

The appeal and engagement of video games has long been documented, and statistics produced by Newzoo and GlobalCollect (Newzoo., 2014) confirmed their far reaching popularity, when they estimated that there were thought to be at least 1.78 billion gamers worldwide as of August 2014. Due to the high uptake of computer games throughout society, particularly amongst children and young adults, researchers and educators have championed the potential reach and use of computer games, simulations and their related technologies, as instructional delivery systems for various learning and behaviour change endeavours (Tobias, Fletcher, & Wind, 2014). As such GBL, began to take on a whole new identity which highlighted technology as a central theme (Kafai & Resnick, 1996). Since Prensky (2007) coined the term Digital Game-Based Learning (GBL) in 2001, GBL has developed within academic practice to primarily refer to the theory of adopting digital games and their technologies for educational purposes. To move towards, and develop a greater body of research surrounding traditional, non-digital GBL techniques, the authors developed the escapED project, in which they could observe human-centred interaction as a means to promote player engagement and motivation within educational games.

The philosophy of escapED, is to aid design of human-centred, interactive GBL experiences. The programme offers educational facilitators the guidance and resources to create their own, live-action games for the purposes of education and positive behaviour change in higher/further education settings. EscapED is

developed from the design and experience of traditional entertainment Escape Rooms, and can be used to incorporate educational themes, learning objectives and behaviour change metrics.

Traditional entertainment escape rooms have grown in popularity, worldwide since 2007 (Nicholson 2005). A white paper conducted by Nicholson (2005) observing trends in entertainment Escape Rooms, defined the games as:

> "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 time". (Nicholson 2005, p2)

Nicolson's (2005) white paper detailed that these short interactive games, have grown to become elaborate and multi-faceted in their designs, to strive for and produce engaging and enjoyable player experiences whilst accommodating a range of small teams of a few people, to thousands of players participating in event settings.

2. Procedure

A prototype experience of escapED for a University training event was developed, targeting staff members with backgrounds in engineering and computing. The educational objectives of the prototype were development of soft skills; communication, leadership and teamwork. The game was designed to produce feelings of action and threat within the players, and overall main player objectives were to free a hostage and disarm a bomb. Riddles, puzzles and communication tasks were developed within this theme to fit the needs of the educational content, the learning objectives and soft skills development.

Figure 1 EscapED Prototype: Room 1 (Bomb Room)

During the prototype trial, 3 teams participated in the game, with a total of 13 players taking part in the event. Each game ran for approximately 30 minutes, 10 minutes for introduction and rules, and 20 minutes' game time. A drama student was employed to play a hostage and provide time awareness/clues to the players throughout the game. Most players were not aware/heard of Escape Room games before the event, however, after an explanation of the concept, players seemed to understand the principles of the game.

Immediately following a play through of the prototype, players was asked to fill in a short exploratory feedback questionnaire on player experiences and perceptions of the game that they played. Four questions were posed to the players;

1. Do you think escapED has any educational value?
2. Would you consider using the escapED program in your lesson plan?
3. What was good about the escapED prototype session?
4. What could we improve?

3. Findings

From 13 participant players, 8 feedback sheets were returned with all questions answered. All written feedback exhibited a positive theme throughout in regards to the experience itself. The words; 'Fun', 'Innovative' and 'Engaging' were repeated throughout the feedback with some player's indicating that they did not realize that 20 minutes had passed. All 8 feedback sheets stated that they could see the educational value of escapED, especially if the puzzles and theme of the experience, were worked into their taught subject matter. All feedback indicated that the players would consider using escapED in their lesson plans but were unsure how to facilitate it. A few responses indicated that they thought the experience would work well as an lesson induction to encourage getting to know other students. A concern brought up through a number of the feedback responses was that participants wanted to know how a game would work with larger groups of players. Feedback received had no suggestions for improvements for the prototype.

Concluding on the prototype trial of escapED, the authors observed first hand and in recordings of the prototype trials, player immersion and engagement of the game. Follow up feedback indicates that all players, enjoyed the game and could see the educational value of escapED. Following observations and feedback, the authors believe there are significant reasons to explore these examples of live-action games for GBL purposes further. It is observed, from the successful collaboration of multi-disciplinary players in the prototype trial, that the program could be used to facilitate cross-disciplinary teaching and learning scenarios. This would be particularly interesting to see developed for education in STEAM (Science, Technology, Engineering and Mathematics combined with Arts) subjects, with focus on bringing staff and students together from across these disciplines to combine knowledge and contribute to something greater.

4. The escapED Framework

This section presents the theoretical framework for escapED (see Figure 2), which was used to design the prototype experience for the University staff training event. The framework provides a template, which could be adopted and adapted for creating personalised escapED solutions for learning.
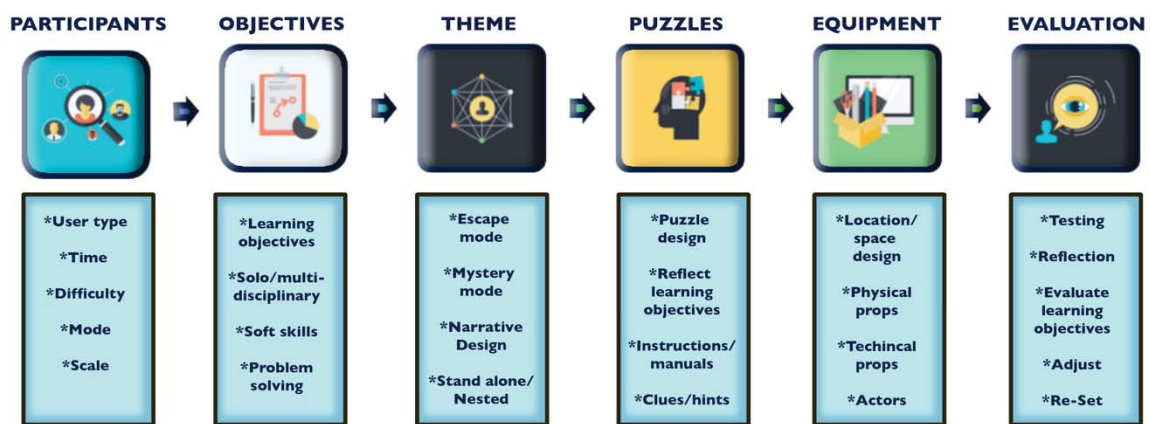

Figure 2 The escapED Framework

Six stages were considered whilst developing the prototype; Participants, Objectives, Theme, Puzzles, Equipment and Evaluation. These areas were influenced and chosen, based on previous works conducted by (Arnab, Clarke 2016)), on the considerations of creating trans-disciplinary GBL experiences. Each of these areas were broken down into specific segments in order to create the prototype game of the escapED project.

Participants

- User Type: User needs assessment is carried out to determine player demographic and educational needs.
- Time: Length of experience. Can be short experience of 15 minutes or a longer experience that lasts multiple days.
- Difficulty: Consideration of intended users to scale difficulty of puzzles for different levels of players such as college students, undergrads, post grads, doctorates and staff.

- Mode: Choose mode of experience such as; Cooperation based: Players work together to solve/escape the experience vs Competitive based: Players compete to be the first to figure out the objectives.
- Scale: Choose number of participants the game is for.

Objectives
- Learning Objectives: Learning objectives are required to create a meaningful educational game. These objectives can be worked into the theme, its puzzles and its mode to help structure the learning plan. Creating tangible learning objectives allows evaluation of players learning experience, learning achievements and can be iteratively re-designed.
- Solo/Multi-Disciplinary: One discipline or multiple disciplines represented within the game experience.
- Soft Skills: Interactive live-action games can aid development of soft skills such as communication and leadership.
- Problem Solving: Develop problem solving challenges to make the game experience interesting to players. A range of challenges will appeal to different learner types.

Theme
- Escape Mode: Escape a locked room in a set time.
- Mystery Mode: Solve a mystery in a set time.
- Narrative Design: Develop a compelling narrative for the game to keep player interest.
- Stand alone/Nested: Determine whether the game is a one off session or part of a larger, nested experience.

Puzzles
- Puzzle Design: Puzzles and riddles make a game experience interesting and can be tailored to fit learning objectives.
- Reflect Learning Objectives: Refer to proposed learning objectives and theme to ensure that puzzles reflect the overall goals of the session.
- Instructions/Manuals: Good experiences have clear, set instructions and rules to help guide players.
- Clues/Hints: Escape Rooms are notoriously hard. Insure clues are available and the method of delivering these clues to players in game does not break player immersion.

Equipment
- Location/Space Design: Ensure enough space for the game experience and that it is comfortable to move around. The environment should reflect the theme as realistic as possible within means.
- Physical Props: Puzzle props, red-herrings + general environment items, these are needed to make a compelling and workable experience.
- Technical Props: Use technology to enhance the game experience. Computers, VR, Augmented Reality, GPS and location-based identification, can all really bring something to these experiences. However, higher risk of things going wrong/crashing/general not wanting to work/player unfamiliarity.
- Actors: Real-life actors can help concrete the experience further as believable. Actors can also be used as timer indicators or can give out hints if they see the players are getting stuck.

Evaluation
- Testing: Test and iterate the game experience before playing a live session with intended participants.
- Reflection: Reflect with the players of their views and experiences interacting with the game.
- Evaluate Learning Objectives: Create a formal evaluation of the learning objectives that were set for the game experience. This can be done via individual preferred methods.
- Adjust: Use player feedback to provide informed decisions on how adjustments of the game experience.

- Re-set: Create a re-set sheet; a list of all puzzles/riddles and intractable objectives within the game that need to be checked over to ensure they are in the correct state before another play-through.

5. Conclusions

Learning in the 21st century is hybrid, where learning experience and process can be scaffolded within digital and physical context and spaces. Exploiting the engaging characteristics of gameplay, escapED provides a hybrid environment within which physical spaces play a key role in creating a creative context to the learning activities, personified by puzzle solving, use of digital means, connecting clues, team work and communication. Such an approach enables the application of hard and soft skills that opens up opportunities for the learning process to be more active and hands-on.

6. Future Works

The authors acknowledge the small sample size of player participation and feedback of the prototype test for escapED. Future works will include developing more experiences with larger samples of participants for further data relating to player engagement and perceived educational value. Additionally, further work will look to trial and validate the use of the escapED framework for creating live-action game-based learning experiences.

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