

Learning and Entertainment Technology Review: The Fusion of Artificial Intelligence and Escape Room Technology

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Abstract. This study focuses on reviewing the potential collaborative energy between artificial intelligence (AI) innovations and escape room entertainment, envisioning a new form of extreme relaxation in the learning and development phase. While dodge rooms have already attracted groups of people with their immersive challenges, implanting artificial intelligence will enhance the experience to extraordinary levels. The review highlights the pivotal points of AI integration into escape rooms and improvements in customization and flexibility. The analysis of 19 studies showed that there are future opportunities to integrate the application of dodge rooms with the use of artificial intelligence. Ultimately, the paper envisions a future where it paves the way for innovative improvements in smart city activities. Although the research refrains from delving into specialized complexities, its goal is to prepare a conceptual guide to encourage the idea of technological integration.

1 Introduction

In the era where innovation and lifestyle are intertwined, the journey of imaginative thrill encounters in smart cities has reached unused levels [1]. As the urban landscape advances, the desire for leisure activities fused with technology and artificial intelligence is also increasing. In this scene, a combination of artificial intelligence (AI) and the development of dodge room technologies to advance education is evolving and promises to unlock unparalleled magic for those who love technological fusion to advance education. is to explore the possibility of integrating AI technology with entertainment in escape rooms in smart cities, to provide a highly interactive and engaging entertainment experience that meets the specific needs and preferences of participants [14]. The paper seeks to identify the benefits of using AI technology in escape rooms, such as customization, adaptability, and immersion, and propose a conceptual framework for developing and implementing AI-enhanced escape rooms to increase educational fun [2]. Escape room technology has long

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captivated gatherings of people with its immersive challenges, and the integration of artificial intelligence offers a modern measure of interactivity, personalization and versatility.

This paper investigates the multifaceted suggestions of consolidating artificial intelligence and escape room innovation inside the setting of keen cities [3]. From upgraded personalization to consistent drenching, the benefits of this cooperative energy are complex, advertising a see into a future where amusement rises above boundaries and captivates gatherings of people on an entirely unused level. Against this scenery, the taking-after segments dig into the complexities of this fusion, examining its potential to reshape the scene of keen city amusement [4]. Through a comprehensive investigation of the synergies between AI and escape room development, this paper points to shed light on the transformative control of innovation in making extraordinary relaxation encounters within the urban circle.

The problem this study addresses is the need for innovative and engaging entertainment options in advanced learning [1] [5]. Traditional forms of entertainment such as movies, music, and sporting events have limitations in their ability to provide personalized and interactive experiences for individuals. Escape rooms have gained popularity in recent years as an interactive and challenging entertainment option, but they still suffer from limitations in terms of customization and adaptability. This paper proposes to integrate AI technology with escape room entertainment to address these limitations and create a new form of entertainment in education for college students [6]. The problem is that current escape room experiences are static and not adaptable to the needs and preferences of individual participants. Integrating AI technology can address this problem providing personalized and adaptive experiences that cater to the specific needs and preferences of each participant [7].

Moreover, the learning entertainment options are often passive and lack interaction between individuals, which is a significant drawback in an age where personalized and interactive experiences are highly valued. The integration of AI and escape room technology has the potential to create a highly interactive and engaging entertainment experience, which could be a significant draw for residents and international students [3][7].

Therefore, this paper aims to explore the potential of this fusion to revolutionize learning entertainment by addressing the limitations of traditional entertainment options and providing a highly interactive and personalized experience for individuals [8]. The paper also aims to emphasize the importance of collaboration between the technology and entertainment industries in achieving this fusion and the potential economic impact of innovative and engaging entertainment options in learning [1].

This study is divided into multiple sections. First, it introduced an idea and the problem of the study to be analysed in this study. Second, the study was followed by a reviewing study for the existence of work-related, where 19 studies were analysed to find the factors and methods to combine technologies such as artificial intelligence with escape room technology to enhance the learning process. Third, a common type of method could be proposed for this kind of merging technologies with its main sections of collecting data and pilot study. Finally, a simple discussion for the literature review papers and a conclusion to implement the final significant analysis from the whole studies with recommendations to the next type of technology integration to enhance learning entertainment.

2 Literature Review

The concept of integrating technologies to enjoy learning that gained strength and purpose in the current era, as universities all over the world have begun to look for innovations and innovative arrangements to advance the quality and usefulness of learning styles. While the progress of educational development has been mainly focused on innovation, the entertainment industry has generally been overlooked [2] [3]. This written survey suggests

exploring the possibility of coordinating AI innovation and dodge room entertainment in lively cities, with the aim of providing a deeply intuitive experience and providing excitement that meets the special needs and inclinations of students and researchers [9]. Figure 1 shows the use of AI for learning entertainment.



Fig. 1. Artificial Intelligence used for Learning entertainment

Escape rooms have become a well-known fascination in numerous courses, giving challenging involvement for members. Members are put in a quiz room and must unravel an arrangement of astounds and challenges to escape a set time constraint [5]. These challenges can run mental challenges and regularly require members to work together as a group. The ubiquity of escape rooms has driven the advancement of different subjects and challenges to cater to distinctive inclinations and interfaces [10].

Moreover, there has been a developing intrigue in joining AI innovation into amusement encounters, counting escape rooms. AI innovation has the potential to improve the personalization and inundation of escape rooms, giving an involvement that caters to the particular needs and inclinations of each member. AI innovation can analyze member behaviour and alter the challenges and astounds appropriately, making a more personalized and versatile encounter [11].

Several studies have explored the potential benefits of using AI technology in escape rooms. A study by [6] examined the use of AI technology in a puzzle-based game and found that participants who played the game with AI assistance performed better than those who played without AI assistance. The authors suggested that AI technology can provide more personalized and adaptive challenges, leading to a more engaging and enjoyable experience.

Another study by [12] explored the use of AI technology in an escape room game and found that the game's difficulty level could be adjusted based on the player's performance. The authors suggested that AI technology could be used to create a more personalized and challenging experience for each participant. Furthermore, several studies have explored the potential of AI technology in enhancing the immersion of entertainment experiences. A study by [13] explored the use of AI technology in a horror game and found that the use of AI-generated content could enhance the immersion of the game, leading to a more engaging and enjoyable experience. Figure 2 shows the use of AI in the entertainment industry.

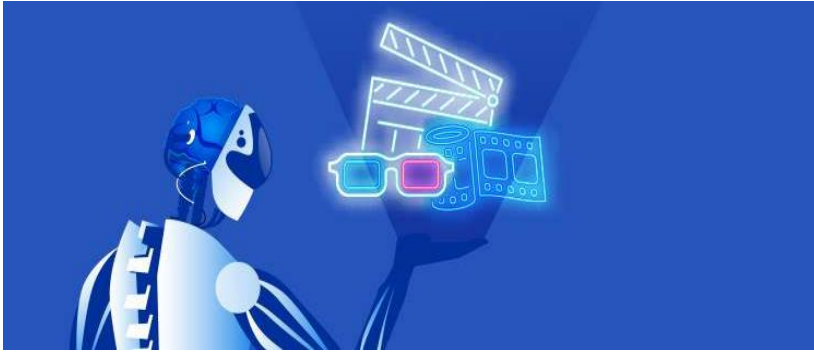


Fig. 2. Artificial Intelligence used for the entertainment industry

The joining of artificial intelligence (AI) innovation and escape room learning methods speaks to a noteworthy advancement within the domain of learning recreation [14][15]. As universities around the world grasp computerized change and look for to upgrade the quality of life for their learners, imaginative approaches to be progressively pertinent. In this segment, we audit existing writing on the integration of AI and escape room innovation, investigating its potential suggestions for advanced learning.

Escape rooms, initially motivated by video diversions and intelligent theatre, have picked up broad notoriety in later a long time as immersive, team-based puzzle-solving encounters. Researchers have recognized their potential as not as it were sources of amusement but moreover as stages for experiential learning, group building, and cognitive incitement [16]. Be that as it may, conventional escape rooms are restricted by their inactive nature, with foreordained perplexes and accounts that offer restricted changeability and flexibility. The joining of AI into escape room plan presents a energetic component that upgrades the generally involvement for members. By leveraging machine learning calculations and common dialect preparation, AI-powered escape rooms can tailor challenges in real-time based on the players' capacities, inclinations, and intuition [17]. This versatility not as it were increments replay esteem but moreover cultivates more profound engagement and inundation, as participants feel more associated with the account unfurling around them.

Additionally, AI integration empowers escape rooms to rise above thinking limitations and expand the gaming encounter past conventional boundaries. Virtual reality (VR) and expanded reality (AR) innovations, regularly utilized in conjunction with AI, permit players to investigate immersive advanced situations and connect with virtual characters and objects [9][18]. This mixing of computerized domains makes a consistent and captivating involvement that reverberates with the tech-savvy groups.

Within the setting of savvy city improvement, AI-enhanced escape rooms hold guarantees as catalysts for community engagement and social interaction. By joining components of gamification and collaborative problem-solving, these encounters can cultivate associations among inhabitants, advance dynamic citizenship, and contribute to the general liveability of urban situations [11][19]. Besides, as cities progressively prioritize supportability and asset optimization, AI-driven analytics inside escape rooms can give important bits of knowledge into client behaviour and inclinations, illuminating decision-making forms related to urban arranging and administration.

In any case, despite the potential benefits of AI-infused escape rooms, a few challenges and contemplations warrant assisting the investigation [20]. Moral concerns concerning information protection, algorithmic inclination, and the potential for addiction or over-reliance on innovation must be tended to guarantee even-handed and dependable execution [12]. Furthermore, the adaptability and openness of AI-powered encounters may posture boundaries to broad appropriation, especially in underserved communities or locales with

restricted innovative frameworks. By and large, the writing recommends that the cooperative energy between AI and escape room development holds a critical guarantee for revolutionizing keen city excitement. By leveraging AI's capabilities to improve interactivity, personalization, and inundation, escape rooms can offer inhabitants and sightseers alike a unforgettable leisure encounter that rises above conventional boundaries and cultivates community engagement within the advanced age [21].

The study [10], this paper does not present any specific data analysis. However, it does discuss the potential benefits of using AI technology in escape rooms to enhance the personalization, adaptability, and immersion of the experience. These benefits are supported by existing research on the capabilities of AI in various domains, such as natural language processing, machine learning, and computer vision [4]. The paper also highlights the potential of this fusion to revolutionize smart city entertainment, which could be supported by data analysis of the economic impact of entertainment options in smart cities. Additionally, it may be possible to conduct user surveys or experiments to gather data on the effectiveness of AI-enhanced escape rooms in providing personalized and immersive experiences [22].

Furthermore, the paper emphasizes the importance of collaboration between the technology and entertainment industries in achieving this fusion. This highlights the potential for cross-industry partnerships and data sharing to support the development and implementation of AI-enhanced escape rooms in smart cities [9]. Overall, while this study does not present any specific data analysis, it proposes a concept that could be supported by future data collection and analysis.

Moreover, the development and implementation of AI-enhanced escape rooms in smart cities could create new job opportunities and contribute to the overall economic growth of the city [10]. The paper highlights the potential economic impact of this fusion on smart cities, emphasizing the importance of investing in innovative and engaging entertainment options to attract learners.

AI technology: This keyword emphasizes the potential benefits of integrating AI technology in escape room entertainment to enhance the personalization, adaptability, and immersion of the experience [16].

Escape room technology: This keyword emphasizes the existing popularity of escape room entertainment as a form of immersive and challenging experience, which could be further enhanced by integrating AI technology [23].

The literature highlights the importance of collaboration between the technology and entertainment industries in achieving this fusion and suggests that further research is needed to explore the potential benefits and challenges of AI-enhanced escape rooms in smart cities [24]. Table 1 summarizes the literature review studies

Table 1. Summarized existence studies

Ref	Technology used	Method applied	Remarks
[2]	Smart cities and sustainability	Survey	Acceptable technology
[3]	AI (Data-driven)	AI prediction	Complex features and significant results
[5]	AI	Survey	Positive impact on technology development
[6]	Emerging technologies	Survey	Positive impact on technology development
[8]	AI	Application	Critical thinking and positive learning process

[9]	Virtual Reality	Survey	Active learning application
[10]	Virtual Reality	Survey	Development for smart cities and applications
[11]	Emerging technologies	Survey	Development for smart cities and applications
[12]	Augment reality	Survey	Useful application for smart city guidelines
[13]	AI	Survey	The active features of GhatGPT to enhance learning
[14]	Gamification (AI)	Survey	Predict a new learning technology using a gamification method
[15]	Escape room tool	Survey	Changing learning tools to enhance the learner's performance
[16]	Escape room tool	Survey	Changing learning tools to enhance the learner's performance
[17]	Digital Media	Survey	Enhance learning entertainment
[18]	Multimodal Technology	Survey	Enhance learning performance
[19]	Virtual Reality	Survey	Enhance learning performance
[20]	AI	Survey	Improve security and challenge of learning technologies
[21]	AI	Survey	developing entertainment in cities
[22]	AI	Application system	Design an advanced model for enhancing learning entertainment

3 Methodology

This study used the common method of doing research of literature review: started with planning, data collection, Analysis, and conclusion with recommendations and limitations. Figure 3 illustrates the research model used for this study.



Fig. 3. Concept Research Model

3.1 Planning

The planning phase focuses over scheduling the entire project with a key timeline. The major activities of this phase include project feasibility, and designing data collection

methodologies. Since the research is linked with data collection from a large number of students, therefore, performing sampling to limit the participants is an essential activity of this phase.

3.2 Data Collection

The research is based on data collection from a large number of students. In this phase, we aim to design and validate a questionnaire. The questionnaire will be distributed to the students to collect data to create a novel model that reflects students' satisfaction and personal innovativeness [20]. Cities worldwide are competing to become smarter, more efficient, and more sustainable. While the development of smart cities has been primarily focused on technology, the entertainment industry has largely been ignored [5]. This paper proposes the integration of AI technology with escape room entertainment to create a new form of smart city entertainment.

Escape rooms have become a popular attraction in many cities, providing an immersive and challenging experience for participants [15]. However, incorporating AI technology could take this concept to the next level by providing a more personalized and adaptive experience. AI technology can enhance the personalization and immersion of escape rooms, providing an experience that caters to the specific needs and preferences of each participant [17].

3.3 Analysis

Moreover, the fusion of AI and escape room technology has the potential to revolutionize smart city entertainment by providing a highly interactive and engaging experience that could attract residents and tourists alike. The paper emphasizes the importance of collaboration between the technology and entertainment industries in achieving this fusion. By combining their expertise and resources, these industries can create a truly unique and unforgettable entertainment experience for individuals in smart cities [9]. This phase concludes the findings of the research. The neural network along with SEM analysis results in novel findings. The artificial intelligence method is evaluated with several key factors including accuracy, precision, sensitivity and specificity. The major focus of the research is to use Artificial Intelligence Anxiety as an external factor to measure the type of effect that the AI may cause [18][22].

3.4 Recommendations and Limitations

Additionally, AI-powered escape rooms have suggestions past amusement, serving as stages for community engagement, social interaction, and experiential learning. By cultivating collaboration, problem-solving, and imagination, these encounters contribute to the social texture of savvy cities, advancing dynamic citizenship and upgrading the general quality of life for inhabitants. In any case, the realization of this vision requires cautious thought of moral, social, and specialized challenges. As cities grasp AI-driven advancement, it is basic to prioritize information security, algorithmic reasonableness, and impartiality to guarantee that keen city amusement benefits all sections of the populace. Moreover, collaboration between stakeholders from the innovation, amusement, and urban arranging segments is pivotal to tackling the complete potential of AI-infused escape rooms and coordinating them consistently into the texture of savvy city activities. The cooperative energy of AI and escape room innovation offers a see into the long-term of savvy city amusement, where boundaries obscure, and encounters rise above the conventional. By opening keen city charm through the integration of AI and escape room technology, cities can make dynamic, comprehensive,

and extraordinary relaxation encounters that reflect the soul of development and creative ability inalienable within the urban scene. As we set out on this travel, let us grasp the conceivable outcomes, explore the challenges, and collectively shape a future where excitement enhances the lives of all who possess and investigate the present-day city.

4 Conclusion

In conclusion, the combination of fake insights (AI) and escape room development speaks to a compelling wilderness within the advancement of shrewd city excitement. Through this amalgamation, cities have the opportunity to rethink urban recreation encounters, advertising inhabitants and guests alike immersive, personalized, and energetic amusement choices that reverberate with the ethos of the computerized age. As highlighted within the writing survey, AI-enhanced escape rooms hold the critical potential to revolutionize conventional gaming involvement by presenting components of flexibility, interactivity, and drenching. By leveraging machine learning calculations and immersive advances such as virtual reality (VR) and increased reality (AR), these encounters can rise above physical imperatives, advertising members a consistent mix of physical and computerized domains.

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