

Human-AI Interaction for Exploring Artificial Intelligence Applications in Recreation Engagement.

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Abstract

This study investigated the emerging role of artificial intelligence (AI) in recreational engagement through human-AI interaction. As digital technologies are increasingly integrated into daily life, AI-powered systems such as conversational agents like ChatGPT can provide new opportunities for planning, personalising, and enhancing recreational experiences. The research explored how AI tools can support creativity, provide personalised suggestions, facilitate access to different recreational options, and assist with scheduling and feedback mechanisms. Using a qualitative design, the study engaged AI-driven simulations and document analysis to examine practical use cases in recreational situations. The findings indicated the potential of AI to increase inclusivity, support decision-making, and enrich user experience in recreational settings. However, concerns regarding digital access, content reliability, and ethical use were equally observed. The study concluded by recommending the need for careful integration of AI tools with human supervision in order to mitigate the risks of contents reliability and ensure that recreational technologies enhance rather than replace the human essence of leisure and play.

Keywords: Human-AI Interaction, Artificial Intelligence, Recreational Engagement, Technology Integration, and User Experience

Introduction

Recreation is a vital component of healthful living, essential for restoring the physical and mental energy depleted by academic and work-related demands. Growing body of studies (Obi, 2024; Ogabor et al., 2024; Sarol et al., 2024; Petersen et al., 2021; Obinwanne & Alozie, 2019) have highlighted the significant benefits of recreational engagement on well-being and performance. However, approaches to recreational engagement is undergoing rapid

transformation, necessitated by the emergence and adoption of digital and intelligent technologies (Barakazi, 2023; Başer, 2020). Recreational activities are inherently diverse and must be planned to accommodate participants needs, interests, and physical or cognitive abilities, including those of children, youth, older adults, and individuals with disabilities, among others. As such, the effective planning and delivery of recreation increasingly requires specialised knowledge and personalised strategies (Puce et al., 2025). Yet, traditional recreation practices, often reliant on professionals using standard guidelines and observational assessments (Puce et al., 2025) are struggling to meet the dynamic and individualised demands of today's populations (Tutar & Turhan, 2023).

Challenges such as limited personalisation, declining participation, accessibility barriers, lack of real-time engagement, inefficient resource allocation, and demand for more new experiences are increasingly undermining the relevance and effectiveness of recreational programmes (Dung et al., 2023; Barakazi, 2023; Ghent et al., 2022). These constraints not only reduce user satisfaction but also limit the broader benefits of recreation for health, social connection, and quality of life. In response to these challenges, the integration of Artificial Intelligence (AI) into recreational planning and delivery presents a promising opportunity to enhance personalisation, inclusivity, innovation and engagement in ways that traditional models cannot easily achieve (Barakazi, 2023).

Artificial Intelligence (AI) is a distinct field within computer science that focuses on developing intelligent machines capable of replicating human-like behaviours such as highlevel cognition, multi-step reasoning, decision-making and real-time feedback (Zuhair et al., 2024). It involves designing systems with large datasets to create algorithms and software, capable of adapting to new situations, problem-solving, reasoning, understanding natural language, analysing data, and making decisions with real-time data (Owan et al., 2023). AI and other smart technologies are increasingly revolutionising the approach to recreation by transforming how activities are planned, delivered, and experienced (Koo et al., 2021). Generative AI, in particular marks a significant improvement in technological advancement (Oliver, A. & Guiller, 2025; Reddy, 2024). With large language models (LLMs) such as ChatGPT, Google Gemini (previously known as Google Bard), and Microsoft Copilot, generative AI has demonstrated remarkable capabilities in natural conversation, decisionmaking support, and personalised recommendations (Puce et al., 2025). What makes them powerful is their ability to draw on massive amounts of data to produce context-sensitive, adaptive, and human-like responses, making them increasingly useful in areas that require individualised guidance, such as engaging in recreational activities.

While the development and integration of Artificial Intelligence (AI) into daily life is still evolving, its immense benefits are already evident across several sectors. In education, AI use has been observed in personalised learning and assessment by adapting content to

individual student needs (Owan, 2023; Wardat et al., 2023). In the healthcare sector, AI has been observed to contribute to early diagnosis, and health decision making (Yella & Kondam, 2023; Zuhair et al., 2024; Sallam 2023; Dhinakaran, et al., 2021). In decision-making situation, the use of AI may allow for more informed and efficient decision. Despite these advancements, limited research has explored the potential of AI within recreational and tourism engagement. This gap suggests the need to investigate how interactive models like Generative Pre-trained Transformers (GPT) can be leveraged to enhance recreational experiences, promote engagement, and support well-being in diverse populations.

In areas like recreation planning and engagement, generative AI has the potential to design personalised and optimised recreational plans that cater to a variety of objectives such as promoting general well-being, diversification of recreational activities, facilitating therapeutic recreation, and enhancing performance in leisure sports (Barakazi, 2023; Başer, 2020). This advantage can bridge accessibility gaps by providing expert-level guidance to individuals who may lack access to recreational professionals due to financial, geographic, or logistical constraints (Chemnad & Othman, 2024). This study sought to explore how ChatGPT can contribute to planning and engagement in recreational activities. The significance of this study lies in its contribution to a growing body of interdisciplinary research on Human-AI interaction. As the recreational and tourism industries evolve to meet the needs of digital-native users, integrating AI tools like GPT could redefine how people engage with leisure activities. Findings from this study may inform both practitioners and developers on how to harness AI for more adaptive, inclusive, and meaningful recreational experiences.

Objectives of the study

The current study was guided by the following objectives

- 1) To explore opportunities of using Generative pre-trained transformers (GPT) in recreational engagement.
- 2) To understand the challenges of using Generative pre-trained transformers (GPT) in recreational engagement.
- 3) To explore how Generative pre-trained transformers (GPT) can be used for planning recreational engagement.

Research questions

The following questions were posed to guide the study:

- 1) What are the opportunities of using Generative pre-trained transformers (GPT) in recreational engagement?
- 2) What are the challenges of using Generative pre-trained transformers (GPT) in recreational engagement?

- 3) How can Generative pre-trained transformers (GPT) be used for planning recreational engagement?

Methodology

This study adopts a qualitative research design, which explores an in-depth understanding of social phenomena within their real-life contexts. To achieve this, document analysis qualitative research method was adopted. Document analysis refers to a systematic procedure for reviewing or evaluating printed and electronic (computer-based or internetaccessed) materials (Bowen, 2009). To align with the research objectives, Generative Pretrained Transformer (ChatGPT-4), was employed as a digital interviewer and data generation tool. This approach was considered appropriate given the increasing use of conversational AI for obtaining information, expert-like consultation, and creative insights. Its capacity to simulate human dialogue and respond contextually made it suitable for exploring diverse perspectives on recreation.

The model was structured around using GPT-4 architecture to gather qualitative insights on key thematic areas, including how ChatGPT can contribute novel ideas to plan and diversify the limited recreational activities available to participants. The same methodology has been applied in recent investigations on similar topics within the fields of tourism and recreation (Barakazi, 2023; Çolak, 2023; Carvalho & Ivanov, 2023; Dwivedi et al., 2023; Fusté-Forné & Orea-Giner, 2023), where document analysis was used to explore AI-generated responses for content development, innovation, and service diversification. These studies further support the validity and relevance of using AI-powered tools like ChatGPT as a data source in qualitative research.

Three questions were posed on the ChatGPT. The interview queries were prepared with reference to the study by Çolak (2023), where “recreational tourism” was replaced with “recreational engagement”. The question statements in this study on the use of GPT in recreational tourism were modified to recreational engagement. ChatGPT's replies were tabulated and presented descriptively. Inferences and suggestions were made in line with the answers given by ChatGPT. Interview questions

Findings

Table 1 shows the responses received from ChatGPT regarding the opportunities that GPT will provide in recreational engagement. According to the ChatGPT response, there are eight different opportunities for the use of GPT in recreational engagement (Interactive Storytelling & Games, creative expression, Social and Recreational Learning, virtual companionship, Augmented Reality (AR) and Virtual Reality (VR) Integration, Fan Engagement and Fandom Culture, Personalised entertainment and group play and social fun). Also, ChatGPT underlines that incorporating GPT technology into recreational engagement can enhance opportunities for

engagement, interactivity and personalization, by adapting content to the user’s personality, interests, and mood in real-time.

Table 1. The opportunities of using generative pre-trained transformers (GPT) in recreational engagement

| GPT’s opportunities | ChatGPT’s answers about opportunities |
|----------------------------------|---|
| Interactive Storytelling & Games | <p>Dynamic narratives: GPT can create evolving storylines in textbased games or virtual environments, adapting to user choices in real time.</p> <p>Role-playing and NPCs: GPT can act as intelligent non-player characters (NPCs) in games, making dialogue more realistic and engaging.</p> <p>Choose-your-own-adventure: Personalised story generation tailored to individual preferences, mood, or genre.</p> |
| Creative Expression | <p>Writing companion: Users can co-write poems, songs, short stories, or screenplays with GPT assistance.</p> <p>Art prompts and inspiration: GPT can generate unique concepts or titles for visual artists, musicians, or filmmakers.</p> <p>Music and lyrics generation: GPT models can produce lyrics, suggest melodies (when combined with other AI tools), or remix old genres into new styles.</p> |
| | <p>Conversational practice: GPT can simulate conversations in different languages or historical contexts (e.g., talking to a figure like Socrates or Shakespeare).</p> |
| Social and Recreational Learning | <p>Trivia and quizzes: GPT can dynamically generate quizzes, riddles, or brain games tailored to a user’s interests or skill level.</p> <p>Hobby support: From cooking to gardening to “Do It Yourself” (DIY) projects, GPT can guide and adapt suggestions based on available materials or constraints.</p> |

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| Virtual Companionship | <p>AI chat buddies: GPT can be used as a casual, friendly conversational partner for people seeking connection or relaxation.</p> <p>Emotional support: While not a substitute for therapy, GPTbased bots can offer companionship or light mood-boosting dialogue.</p> |
| Augmented Reality (AR) and Virtual Reality (VR) Integration | <p>GPT can provide real-time narrative augmentation in VR games or environments, generating live responses, voiceovers, or plot development.</p> <p>In AR scavenger hunts or escape rooms, GPT can dynamically create puzzles or clues based on participant behavior.</p> |
| Fan Engagement and Fandom Culture | <p>Fan fiction: GPT can help users generate new plots, dialogue, or character arcs for favorite shows, books, or games.</p> <p>Chat with fictional characters: Simulate conversations with characters from novels, movies, or games for immersive fan experiences</p> |
| Personalised Entertainment | <p>GPT can curate personalised jokes, short stories, bedtime tales, or themed content (e.g., sci-fi horror, romantic comedy).</p> <p>It can even simulate a late-night talk show hosted by a fictional character or conduct interviews with historical figures in fun formats.</p> |
| Group Play & Social Fun | <p>Party games: GPT can facilitate games like "Would You Rather," "Two Truths and a Lie," or custom trivia.</p> <p>Collaborative storytelling: Multiple users can co-create a story or poem, with GPT helping to mediate and enhance the experience.</p> |

Table 2 illustrates the responses from ChatGPT regarding the challenges that may be experienced in using GPT in recreational engagement. While Generative Pre-trained Transformers (GPT) offer exciting possibilities for recreational engagement, several challenges must be considered to ensure safe, meaningful, and effective use in recreational engagement. These challenges were categorized into technical (inaccurate or misleading outputs, difficulty understanding complex context or sarcasm, limited emotional intelligence and biases), ethical (risk of generating harmful or offensive content, reinforcement of stereotypes and bias, overuse as a substitute for human connection and concerns in simulated companionship), social (reduced real-life social interaction, negative impact on creativity, potential alienation of users and shifts in cultural norms) and practical challenges (access barriers, cost of deploying highquality GPT tools for public or low-resource settings, content moderation and safety infrastructure needs, scalability and maintenance). ChatGPT also highlights addressing these challenges requires a combination of technological advancements, ethical considerations, usercentred design, and continuous monitoring.

Table 3 illustrates the responses from ChatGPT regarding how it can be used for planning recreational engagement. It revealed that GPT can be a powerful tool for designing creative, inclusive, and personalised recreational experiences. It can serve as a flexible assistant for both recreational professionals and casual organisers, especially when guided by human insight. Its utilisation for planning recreational engagement were categorised into ideation, customisation, content creation, logistics, accessibility and evaluation of the participants experience.

Table 2. The opportunities of using generative pre-trained transformers (GPT) in recreational engagement

| GPT's challenges | ChatGPT's answers about challenges |
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| Content Accuracy and Reliability | <p>GPT can generate false or misleading information presented with confidence. In recreational learning or storytelling, this could confuse users or spread misinformation.</p> <p>Lack of fact-checking: When used for trivia, quizzes, or educational games, GPT may provide outdated or incorrect facts unless carefully monitored.</p> |
| Inappropriate or Harmful Outputs | <p>GPT may unintentionally reproduce cultural, gender, or racial biases present in training data, which can surface even in lighthearted or recreational contexts.</p> <p>Without safeguards, GPT might generate inappropriate jokes, dark themes, or culturally insensitive material, especially in unsupervised use.</p> |
| Over-Reliance and Reduced Human Creativity | <p>Users might become overly reliant on GPT for ideas or creative content, potentially diminishing their own imagination and creative growth.</p> <p>In group settings (e.g., classrooms or clubs), GPT might replace interpersonal brainstorming and storytelling</p> |
| User Safety and Mental Health Concerns | <p>While GPT can simulate emotional support, it may give users a false sense of connection or understanding, which can be problematic if relied upon in emotionally vulnerable states.</p> <p>Recreational GPT tools can be engaging to the point of compulsion or excessive screen time.</p> |
| Lack of Emotional and Contextual Understanding | <p>GPT may misinterpret jokes, sarcasm, or sensitive emotional cues, leading to awkward or even hurtful responses during play or social interaction.</p> <p>It lacks true empathy or emotional depth, which may limit its effectiveness in therapeutic recreation or support-based engagements.</p> |
| Accessibility and Digital Divide | <p>Recreational use of GPT often requires internet access, modern devices, and digital literacy, which may limit inclusion in lowresource communities or among older adults.</p> <p>Although GPT supports many languages, it still performs best in English and may struggle with regional dialects or culturally nuanced expressions.</p> |
| Data Privacy and Ethical Concerns | <p>When recreational tools collect or process user inputs (e.g., in chatbots or games), there's a risk of mishandling personal or sensitive information.</p> <p>GPT-based apps must have strong content filters and privacy protections to be used safely by younger users</p> |

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| <p>Legal and Intellectual Property Issues</p> | <p>Generated stories, art prompts, or song lyrics might inadvertently mimic copyrighted material, raising legal or ethical concerns.</p> <p>Questions arise about who owns content co-created by humans and AI, especially in collaborative recreation (e.g., writing or art).</p> |
| <p>Cost and Resource Constraints</p> | <p>High-quality, safe, and responsive GPT-based recreational tools require investment in infrastructure, moderation, and continual updates.</p> <p>Many GPT-powered services are behind paywalls, limiting widespread access for public institutions like libraries or youth centres</p> |

Table 2. How Generative pre-trained transformers (GPT) can be used for planning recreational engagement

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| <p>GPT’s use for planning recreational activities</p> | <p>ChatGPT’s answers about challenges</p> |
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| Ideation | Generating ideas for recreational activities: GPT can serve as a brainstorming partner for event planners, educators, therapists, or programme coordinators. For example, it can be used to recommend age-appropriate or group-specific activities (e.g., for children, older adults, people with disabilities) and suggesting lists of indoor vs. outdoor activities. |
| Customisation | GPT can adapt plans based on age, interests, group size, physical ability, cultural context and available resources. For example, it can be used to design low-mobility games for elderly participants, offer craft ideas for children using recycled materials and creating multilingual or culturally sensitive content. |
| Content creation | GPT can draft step-by-step instructions, icebreaker questions, game rules, activity sheets or prompts, printable schedules or event guides. It can be used for writing the storyline and challenges, drafting trivia questions and preparing introductory scripts for recreational facilitators |
| Logistics | Providing real-time planning support: GPT can help solve logistical challenges in the planning process. For example, it can be used for creating schedules based on time and space constraints, suggesting contingency plans for weather-related changes (e.g., indoor alternatives) and helping draft event invitations, promotional messages, or registration forms. |
| Accessibility | Enhancing Inclusion and Accessibility: GPT can support universal design by offering alternative activity formats (e.g., visual, auditory, text-based), simplified instructions for participants with cognitive impairment and suggesting for gender-neutral or culturally appropriate activities. |
| Evaluation | Supporting Program Evaluation: After the event, GPT can help with drafting participant feedback forms, summarising responses and suggesting improvements for future events. |

Discussion and Conclusion

As artificial intelligence becomes more embedded in everyday life, it is gradually influencing how people approach recreation. Generative AI models like GPT have moved beyond being mere sources of information, they now serve as creative collaborators, idea generators, and helpful tools for organising leisure activities. This development brings exciting possibilities, but also calls for careful consideration. One advantage is GPT's ability to adjust recreational content based on the needs, preferences, and capabilities of different individuals. This adaptability supports wider participation by making activities more inclusive. For

individuals who have difficulty generating ideas or making plans, GPT can provide helpful prompts and suggestions. It also contributes to organising and managing recreational schedules, especially in contexts with limited personnel or resources. However, there are challenges to consider. Issues around accuracy, privacy, and overdependence on AI must be addressed, especially when working with vulnerable groups. Additionally, unequal access to the internet, devices, and digital literacy means not everyone can benefit equally. In such cases, relying too much on AI tools could deepen existing disparities in recreational opportunities.

AI does not need to take over play to be useful, it just needs to support it. When used with care, GPT can help people plan better activities, discover new interests, and make recreation more inclusive and enjoyable. But like any tool, its value depends on how it is used. At its core, recreation is about joy, connection, and growth. AI can support those things, but it can not replace them. The real opportunity lies in using AI to enrich human experiences while keeping the human element at the centre.

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