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Interactive Success: Empowering Young Minds through Games-Based Learning at NADI PPR Intan Baiduri

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ABSTRACT

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This study explores the transformative potential of game-based learning (GBL) as a pedagogical approach to enhance youth entrepreneurship education, specifically focusing on the "Store Manager: My Supermarket" simulation game. Conducted in the National Information Dissemination Centre (NADI) PPR Intan Baiduri, Kepong, Malaysia, the research targeted 20 young participants aged 10 to 12, investigating how GBL can foster critical thinking, entrepreneurial skills, and learner engagement. The findings reveal that 80% of participants experienced substantial improvements in their understanding of business principles, 77% reported increased confidence in applying entrepreneurial strategies, and 98% acknowledged heightened engagement in the learning process. The game's design replicates real-world business challenges in a risk-free and interactive environment, effectively bridging the gap between theoretical knowledge and practical application. Moreover, 87% of participants expressed enthusiasm for the game-based approach, citing its engaging and hands-on nature as a key factor in sustaining interest and motivation. The study highlights the scalability of GBL for fostering entrepreneurship skills, particularly among underprivileged communities, and advocates for its integration into broader educational frameworks to address generational shifts in learning preferences. The findings position GBL as a dynamic and inclusive alternative to traditional teaching methods, capable of preparing the next generation with the critical skills required to thrive in an increasingly complex and entrepreneurial world.

1. Introduction

The emergence of Generation Alpha (those born after 2013) has brought significant shifts in educational paradigms. Often referred to as "digital natives", these cohorts have been immersed in technology from an early age, shaping their learning preferences and behaviours [1]. Thriving in interactive, technology-driven environments, they prefer dynamic, hands-on methods of acquiring

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knowledge over traditional lectures and rote learning [2]. This shift demands innovative approaches tailored to their unique characteristics.

Generation Alpha presents unique challenges to traditional educational approaches. With their short attention spans and tendency to become easily disengaged due to rapidly shifting interests [3,4]. Generation Alpha spends a lot of time using mobile phones and playing games, which makes traditional teaching methods less effective for them. These methods may not hold their attention or match their learning styles. To better engage this generation, educators need to adopt more interactive, tech-based approaches, such as gamified learning, to align with their digital habits and preferences [5].

Entrepreneurship, characterised by innovation, problem-solving, and the ability to identify and act on opportunities, has become a crucial skill in the 21st century [6]. For digital-native generations, entrepreneurship education provides not only a pathway to economic empowerment but also a framework for developing adaptability and resilience in rapidly changing environments [7]. Entrepreneurship is the capacity to turn ideas into action, tackle challenges, embrace risks, innovate, think creatively, make sound decisions, and take proactive initiative. Entrepreneurship involves blending creative and innovative ideas with strong management and organizational skills to bring together individuals, capital, and resources. This process is aimed at addressing a specific need while generating value and creating wealth [8]. Embedding entrepreneurial concepts into educational methods, particularly through experiential learning tools, equips Generation Alpha with the competencies needed to thrive in an uncertain and competitive global economy.

Adapting the educational system to align with Generation Alpha's digital-first mindset is essential for creating learning experiences that are both relevant and impactful [9]. By leveraging technology and embracing dynamic, student-centred approaches, educators face challenges to interact and communicate with Generation Alphas, as well as adapting a suitable educational system for this tech-savvy generation. Therefore, Game-based learning (GBL) has gained prominence as a transformative educational tool, offering interactive, immersive, and experiential learning opportunities that align with these digital-native generations' cognitive and behavioural traits. GBL is particularly effective in bridging the gap between theoretical concepts and practical application, fostering critical thinking, problem-solving, and collaboration skills [10]. It has been recognised globally for its potential, especially in underserved communities, where it enhances entrepreneurial skills and financial literacy.

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Due to the special characteristics of Generation Alpha and the benefits in learning the entrepreneurships for young generation, this study investigates the impact of GBL on youth entrepreneurship education through the "Store Manager: My Supermarket" simulation game. It examines how GBL influences engagement, motivation, and learning outcomes among Generation Alpha participants while evaluating the development of critical entrepreneurial skills such as financial management, strategic planning, and problem-solving. Furthermore, it explores the potential for scaling GBL to other underserved communities in Malaysia. By addressing these objectives, this research contributes to the growing body of literature on GBL and provides actionable insights for educators and policymakers aiming to innovate educational practices for digital-native learners.

1.1 Educational Challenges for Generation Alpha

Despite their digital fluency, youth from socio-economically disadvantaged communities face distinct challenges. Communities like PPR Intan Baiduri have limited access to quality educational resources, infrastructure, and opportunities in Malaysia. The traditional teaching methods often fail to engage these learners, reducing motivation and academic performance [11,12].

Generations Alpha requires educational methods that are not only engaging but also contextually relevant. Interactive platforms like GBL present an opportunity to overcome these barriers by integrating entertainment with education. For example, simulation games like "Store Manager: My Supermarket" provide a practical, risk-free environment for learners to acquire entrepreneurial skills, including budgeting, resource management, and strategic decision-making [13]. These games address the specific needs of Generation Alpha by offering personalised feedback, adaptive challenges, and real-world scenarios.

1.2 Global Relevance and Local Applications

GBL has been successfully implemented in diverse contexts, including STEM education in developed countries and financial literacy programs in underprivileged communities across Africa and Southeast Asia [14]. These programs highlight the scalability and adaptability of GBL in addressing educational disparities. For instance, studies show that digital games can increase cognitive engagement by 30%, improving knowledge retention and application [13].

In Malaysia, the integration of GBL aligns with national efforts to foster entrepreneurial thinking among youth as a pathway to socio-economic mobility. By targeting communities like PPR Intan Baiduri, GBL can serve as a tool for bridging educational gaps and empowering the next generation with the skills needed to navigate a rapidly changing world.

2. Methodology

Figure 1 illustrates the methodology employed in this study, referred to as the **Set objective, Immerse in simulation, Measure performance (SIM)** Learning Design Framework. This framework offers a systematic approach to integrating simulations into game-based learning, ensuring a cohesive and effective learning experience. It is structured into three distinct phases: (i) Setting Objectives, where learning goals and desired outcomes are defined; (ii) Immersion in Simulation, involving active participation and engagement in the simulated environment; and (iii) Performance Measurement, where outcomes are evaluated against the predefined objectives.



Fig. 1. SIM Learning Design Framework

The following describes the activities involved in each phase.

i. Setting Objectives

The research commenced with the Setting Objectives phase, where learning outcomes were clearly defined, and a game-based learning (GBL) intervention was designed to target entrepreneurial decision-making and strategic thinking. This phase focused on establishing clear learning goals, such as improving financial decision-making or fostering teamwork skills.

Therefore, a detailed research plan was formulated to guide the study. A bilingual questionnaire in Malay and English was designed to ensure inclusivity and cater to participants' linguistic preferences. The survey was divided into two sections: (i) demographic information, such as age, gender, and prior experience with games or entrepreneurial concepts, and (ii) participants' perceptions of how the GBL impacted their understanding, confidence, and interest in entrepreneurship. Data collection employed a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), a widely recognised and reliable tool in social science research [11]. This survey uses convenience and purposive sampling and is aimed at children aged 10-12 years from the PPR Intan Baiduri community.

ii. Immersed in Simulation

The second phase, Immerse in Simulation, engages learners in an interactive and hands-on environment. Learners were introduced to the simulation scenario, assigned specific roles, and provided with detailed instructions to ensure a comprehensive understanding of the rules and tools at their disposal. During this session, participants make decisions, solve challenges, and respond to dynamic events like market fluctuations or unexpected obstacles. Real-time feedback from the simulation allows learners to see the immediate consequences of their actions, encouraging critical thinking and strategy refinement. This foundational step is critical for creating an engaging and effective learning experience.

The game-based learning (GBL) approach in this study utilised the "Store Manager: My Supermarket" game. This game was selected for its realistic simulation of business challenges, such as inventory management, budgeting, and customer service optimisation. Its design aligns with Kolb's experiential learning theory, which emphasises acquiring knowledge through active participation and reflective observation [15].

Before beginning gameplay, participants received a brief tutorial to ensure they were familiar with the game mechanics. The "Store Manager: My Supermarket" game served as the primary instrument for the study and incorporated several key features:

- a) **Realistic Challenges:** Participants faced tasks such as balancing budgets, managing inventory, making pricing decisions, and simulating actual business operations [16].
- b) **Immediate Feedback:** Adaptive feedback mechanisms allowed participants to learn from their successes and failures, enhancing critical thinking and decision-making skills [13].
- c) **Engaging Design:** The visually appealing interface and interactive mechanics were tailored to the preferences of Generation Alpha learners, ensuring sustained engagement throughout the gameplay.

Figure 2 shows the user interface of the "Store Manager: My Supermarket" game [17].

Next, participants were invited to engage with the game actively. Participants were presented with hypothetical business scenarios modelled on the game's challenges. They were tasked with applying strategies learned during gameplay to solve these scenarios. For example, participants were required to balance budgets under constraints, optimise inventory levels to meet fluctuating

demand, and plan promotional activities to maximise profits. Besides that, guided discussions were conducted to help participants reflect on their strategies and improve their understanding.

At the end of the game session, participants were asked several questions to share their opinions, aimed at reinforcing the connection between their simulation experience and real-world applications. This process encouraged learners to apply their newly acquired skills through follow-up activities and actionable plans. This holistic approach provided a comprehensive evaluation of GBL's effectiveness in fostering engagement, critical thinking, and the development of practical skills. Therefore, participants can transfer and apply theoretical knowledge to practical problems [13].



Fig. 2. The user interface of Store Manager: My Supermarket game

iii. Measure Performance

The study employed a systematic approach to assess the impact of game-based learning (GBL). A key component of this approach was the Measure Performance phase, during which quantitative metrics were used to evaluate progress at critical junctures of the simulation. Participants were asked to complete a self-administered questionnaire to gather quantitative data on their perceptions of the learning experience. The questionnaire included items that measured the challenges faced during the simulation and participants' suggestions for program improvement, with numerical ratings used to quantify the impact of these factors. The resulting data were analysed using Microsoft Excel to derive meaningful insights from the participants' feedback.

3. Result and Discussion

3.1 Demographic Information

The demographic analysis revealed that 16 participants were boys, while only four were girls, as illustrated in Figure 3. This gender imbalance highlights a significant disparity that might stem from various socio-cultural and structural barriers. Traditionally, males are more likely to be encouraged to engage in entrepreneurial and financial education programs, particularly in male-dominated societies where economic independence and leadership skills are seen as essential attributes for boys [18]. In contrast, girls may face restricted access to such programs due to societal expectations,

domestic responsibilities, or a lack of tailored outreach. These findings indicate a critical need for future iterations of such programs to actively address gender inclusivity by creating targeted strategies that appeal to and encourage female participation. For instance, the integration of female role models in the game narratives or specific outreach campaigns promoting female representation could reduce this disparity, ensuring that the benefits of game-based learning extend equitably across all demographics. Gender inclusivity not only enhances representation but also fosters a more diverse learning environment that can lead to better collaboration and innovation.

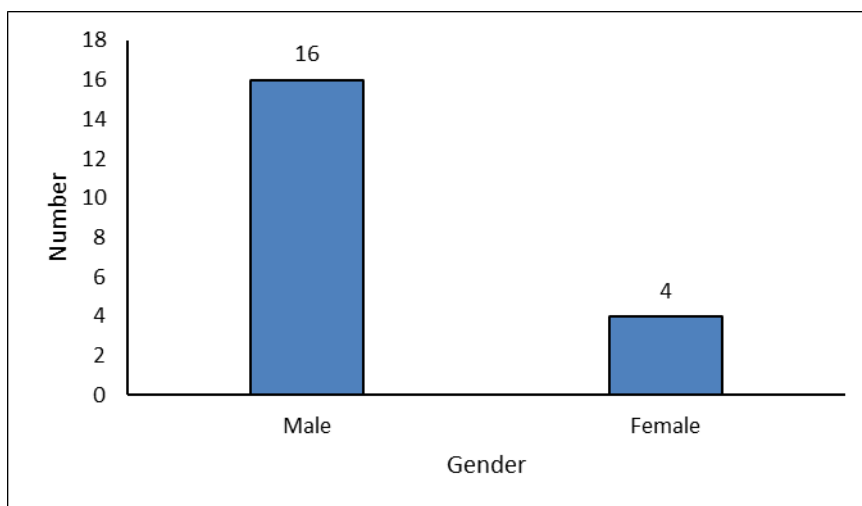


Fig. 3. The percentage of participant distribution based on gender

3.2 Perceptions of Game-Based Learning in Entrepreneurial Knowledge and Skills Development

A key outcome of the study was the improvement in participants' understanding of business concepts. Survey responses revealed that 80% of participants strongly agreed that the "Store Manager: My Supermarket" game played a crucial role in enhancing their comprehension of essential entrepreneurial concepts, while 20% agreed (Figure 4). Previous research has shown that GBL can significantly enhance understanding of business principles by providing hands-on experience and reinforcing theoretical knowledge [19,20]. These findings align with the results of this study, where participants reported a substantial increase in their grasp of entrepreneurial concepts through the use of the "Store Manager: My Supermarket" game.

Figure 5 reveals that 77% of respondents "Strongly Agree" and 19% "Agree" that games boosted their confidence in applying learned concepts, particularly in real-world scenarios. This finding is consistent with prior studies highlighting the effectiveness of simulations in fostering active learning and knowledge transfer [21-23]. Kolb's experiential learning theory emphasises that learning is most effective when individuals engage in hands-on problem-solving and reflect on the outcomes [24]. Sitzmann (2011) further confirms that simulation-based learning significantly enhances self-efficacy and the ability to apply knowledge in professional settings [25,26]. The high level of agreement among respondents in this study reinforces these insights, showing that participants felt better prepared to tackle challenges like financial decision-making and strategic planning after engaging with GBL. Meanwhile, 4% of respondents who selected "Neutral" indicated they did not express a clear stance on whether games boosted their confidence in applying knowledge from game-based learning (GBL). Therefore, an opportunity to explore their perspectives further or refine the game design and support strategies is suggested to meet their needs better and clarify the learning outcomes.

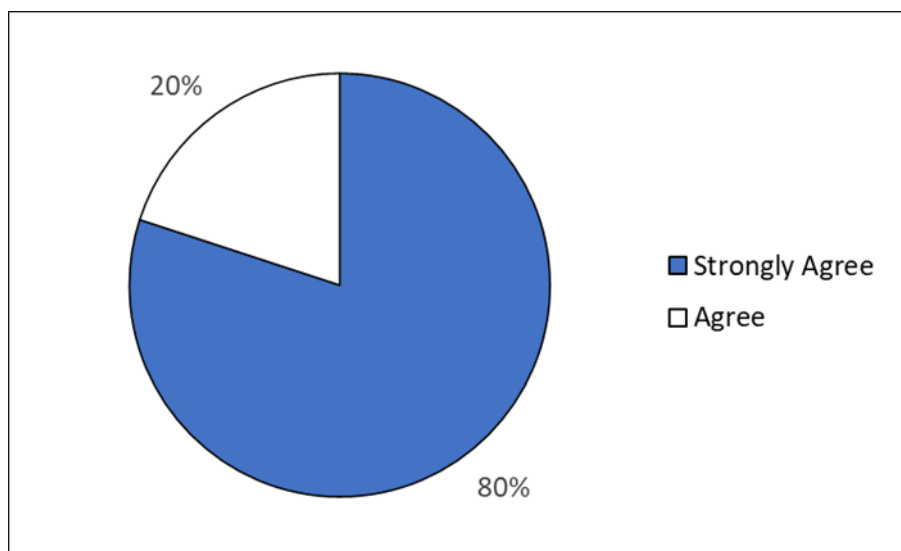


Fig. 4. Effectiveness of Store Manager: My Supermarket Game in Learning Entrepreneurial Concepts

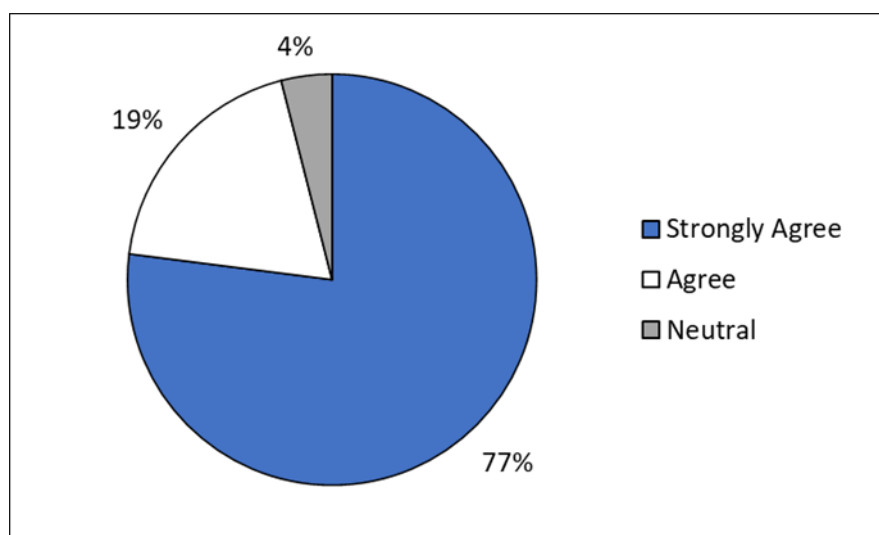


Fig. 5. Confidence in Applying Knowledge from Game-Based Learning GBL

Figure 6 illustrates that 98% of respondents "Strongly Agree" that GBL enhanced their engagement in learning entrepreneurial concepts, with only 2% providing lower ratings. This overwhelmingly positive response highlights the critical role of engagement in effective learning, particularly for Generation Alpha learners, who thrive in dynamic and technology-driven environments. The immersive nature of "Store Manager: My Supermarket" captured learners' attention and encouraged active participation, making the educational experience both enjoyable and impactful. The opportunity to learn through trial and error in managing business and the immediate feedback provided by the game allowed participants to build confidence and competence in their entrepreneurship abilities. This further validated the effectiveness of GBL approaches in educational settings.

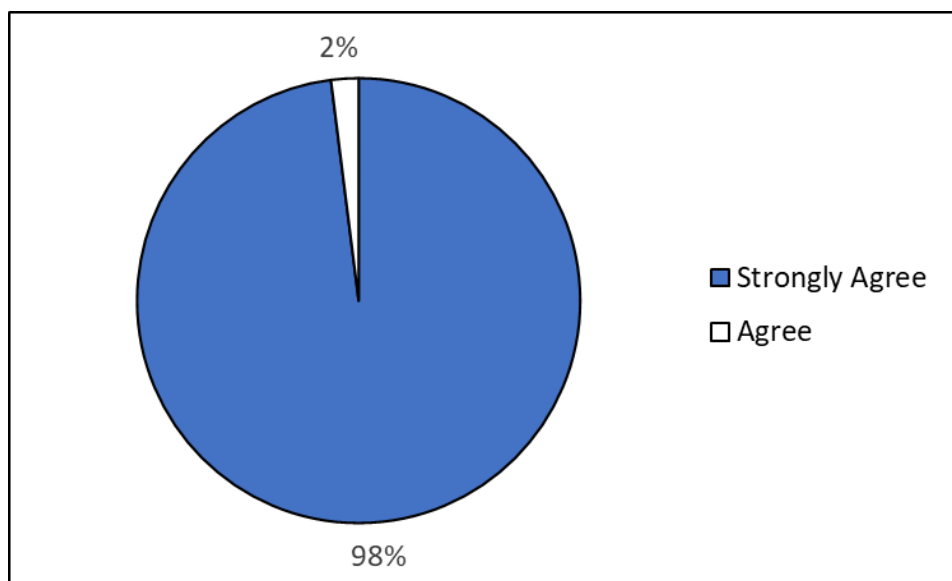


Fig. 6. Game-based learning enhances engagement in learning entrepreneurial concepts

Feedback from participants highlighted the value of the interactive learning environment (see Figure 7), with 87% indicating that it made the material more relatable and enjoyable. These findings align with Seaborn and Fels [27], who found that GBL enhances motivation and comprehension by translating abstract concepts into tangible task. The ability to learn through trial and error, coupled with immediate feedback, helped participants build confidence and competence in their abilities. Additionally, 87% of respondents "Strongly Agree" and 10% "Agree" that GBL will likely attract future participation, demonstrating the scalability and sustainability of this approach. The innovative use of GBL to create an enjoyable and immersive learning environment resonates with younger generations, who prefer interactive and experiential educational formats [28]. Furthermore, 3% of respondents who selected 'Neutral' were undecided on whether to continue using GBL for learning. These results highlight the potential of gamification to revolutionise education by increasing accessibility and engagement among learners from diverse backgrounds.

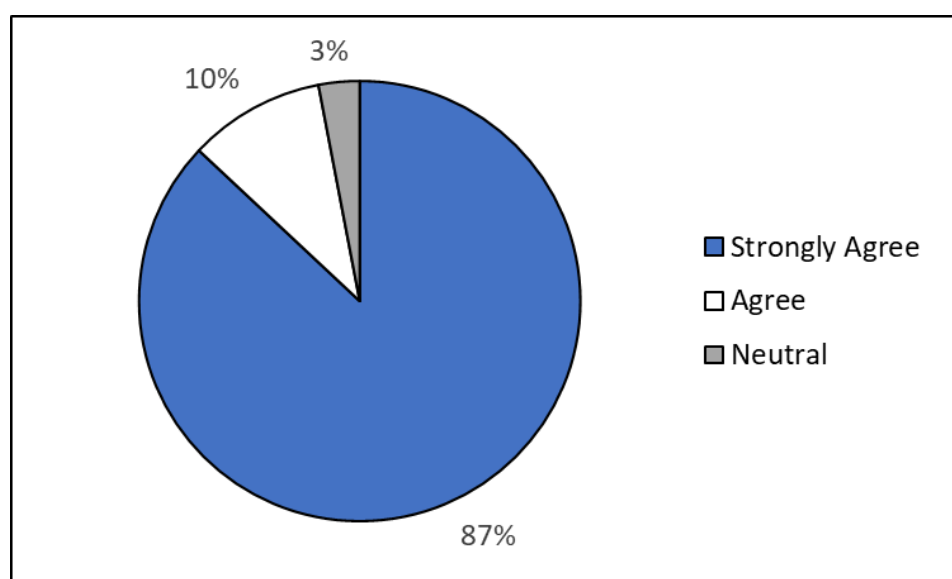


Fig. 7. The potential of Game-Based Learning as an effective learning tool

Based on this study, while the GBL approach for learning entrepreneurship received positive feedback from participants, a notable gender imbalance among them was observed. Several strategies can be implemented to increase the participation of girls. These include leveraging social media and digital platforms to raise awareness about the benefits of learning entrepreneurship through GBL. Creating visually appealing posters combined with engaging videos and animations can capture attention and generate interest. Additionally, fostering peer influence by encouraging participants to involve their friends and offering incentives can motivate more girls to take part in such studies. These approaches aim to make the study more accessible, relatable, and appealing to a broader female audience. Besides that, the outreach initiatives, mentorship program and the integration of female role model should be considered in the future.

GBL fosters a love for learning in children by combining fun and education. It not only enhances academic skills but also supports emotional, social, and physical development. By making learning more interactive and personalized, GBL helps children achieve their potential in a dynamic and engaging manner. This approach shows potential as an effective tool for Generation Alpha to learn new concepts in entrepreneurship and other areas of knowledge. For example, GBL can be utilized in special needs education, fostering behavioural and emotional development, and empowering learners to transform ideas into action. It encourages problem-solving, risk-taking, innovation, creativity, decision-making, and initiative, making it a versatile tool for holistic growth and skill-building [29].

4. Conclusion

Game-based learning (GBL) has proven to be a transformative and impactful educational approach, particularly effective in addressing the unique needs of communities like PPR Intan Baiduri. Through the integration of interactive simulations and real-world scenarios, GBL fosters higher engagement, critical thinking, and practical skill development among participants. This study illustrates the potential of tools such as the "Store Manager: My Supermarket" game to bridge the gap between theoretical concepts and practical applications, empowering learners with essential entrepreneurial skills for navigating the demands of a rapidly changing economy.

The findings underscore that GBL is not only a suitable approach for modern education but a necessary one, particularly for Generation Alpha learners, whose preferences align with technology-driven, interactive learning experiences. By creating inclusive and dynamic educational environments, GBL can address current educational disparities while equipping learners to face future challenges with confidence. To maximize its impact, expanding game-based learning (GBL) initiatives to reach broader demographics and integrating them with traditional teaching methods will be vital for achieving long-term educational transformation. To enrich future findings, it is recommended to incorporate qualitative data collection methods, such as focus group interviews. This approach is expected to offer a deeper understanding of participants' experiences and the effectiveness of GBL in fostering entrepreneurial learning among Generation Alpha. As global education systems continue to evolve, GBL emerges as a pivotal strategy for driving innovation, enhancing engagement, and nurturing a culture of lifelong learning.

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