

Students' Critical Thinking Skills in Learning through Gamification

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ABSTRACT

In the era of rapid modernization, the education sector is required to continuously adapt to technological developments, particularly in addressing the learning characteristics of Alpha Generation students who are highly familiar with digital technology and games. This study aims to explore the use of gamification as a teaching strategy to support the learning process and enhance students' critical thinking skills. The research employed a qualitative method by selecting participants who were directly involved in gamified learning activities. Data were collected through interviews and classroom observations using structured interview instruments and observation notes to obtain in-depth and meaningful information. The collected data were analyzed qualitatively to identify patterns related to student engagement and critical thinking development. The findings reveal that game-based learning, specifically through the use of the Undercover game, positively influences the teaching process by increasing student engagement, analytical thinking, problem-solving abilities, and decision-making skills. Students were actively involved in analyzing information, evaluating alternatives, and collaborating with peers during the learning activities. The discussion indicates that gamification aligns well with the learning preferences of Alpha Generation students and creates an interactive learning environment that supports higher-order thinking skills. In conclusion, gamification can be considered an effective instructional approach for fostering critical thinking skills and improving learning outcomes in contemporary educational contexts.

Keywords : *Critical Thinking Skill, Gamification, Alpha Generation.*

INTRODUCTION

In the 21st century, critical thinking has become one of the most essential skills for learners to succeed in both academic and professional contexts. It enables students to analyze information, evaluate evidence, and make sound judgments in an era where information is abundant but often unreliable (Aisyah et al., 2019). Students who can critically assess, synthesize, and apply knowledge tend to perform better academically, particularly in modern learning environments that demand higher-order thinking skills (Guamanga et al., 2024).

Despite its importance, many studies indicate that novice learners, especially those from Generation Alpha, demonstrate weak critical thinking abilities. This limitation is largely attributed to traditional teaching approaches that emphasize memorization rather than inquiry, analysis, and problem-solving (Faradella et al., 2024). At the same time, Generation Alpha born in a highly digital and technology-driven era are often passive consumers of fast, algorithm-based content, which reduces opportunities for deep reflection and critical evaluation (Jukić & Škojo,

2021). As a result, there is an urgent need for learning approaches that align with their digital habits while fostering critical thinking skills. One of its skills is the ability to think critically, which is also known as critical thinking. Students can gain critical thinking skills using an effective learning paradigm (Mardiansyah, Saptono, & Setiawati, 2019). Researchers in the fields of sociology, education, and psychology are continuously reevaluating the traits belonging to the alpha generation, which includes born between 2010 and 2025. They are becoming the most advanced technology "skilled" and the generation that is educated in history as They are followed, shaped, and marked by technology. It seems that the alphas are the first real digital natives to understand and use the original digital technology language.

Recent literature highlights gamification as a promising pedagogical approach to address this challenge. Gamification integrate game elements such as points, challenges, roles, and problem-solving tasks into learning activities, increasing motivation, engagement, and meaningful learning experiences (Wibisono et al., 2024). Moreover, gamified learning environments encourage students to analyze situations, make decisions, collaborate, and justify their reasoning key components of critical thinking (Kwangmuang et al., 2024). However, research examining how gamification can be systematically designed to enhance critical thinking skills, particularly for Generation Alpha learners, remains limited.

One example of a gamified learning activity is the Undercover game, a word-based social deduction game that requires players to analyze clues, evaluate peer responses, and make strategic decisions. Such games create authentic contexts for discussion, reasoning, and decision-making, making them suitable for developing both language skills and critical thinking abilities (Nita Pertiwi, 2023).

Critical thinking is widely recognized as an essential skill in contemporary education, particularly in learning environments that require learners to interpret information, evaluate perspectives, and make reasoned decisions. However, many Generation Alpha students demonstrate limited critical thinking development, which is often linked to traditional instructional practices and passive engagement with digital content. As digital natives, Generation Alpha learners require learning approaches that resonate with their technological experiences while supporting deeper reflection and analysis. Recent qualitative studies suggest that gamification offers meaningful learning experiences by creating interactive, collaborative, and problem-based environments that stimulate critical thinking. Through gamified activities, students engage in discussion, reasoning, and decision-making processes that reflect key dimensions of critical thinking. Nevertheless, there remains a need for in-depth qualitative research that explores how gamification is experienced by Generation Alpha learners and how such experiences contribute to the development of critical thinking skills, particularly through learning activities such as the Undercover game.

Given the characteristics of Generation Alpha and the growing demand for critical thinking skills, this study seeks to describe how gamification can be designed

to foster critical thinking among Alpha Generation students and how these learners experience the development of critical thinking through gamified learning environments.

REASERCH METHOD

This study employed a qualitative descriptive method, as it is particularly appropriate for describe phenomena that involve perceptions, experiences, and cognitive processes. Qualitative research emphasizes the exploration of meanings and interpretations through textual and observational data rather than numerical measurement, enabling an in-depth understanding of complex learning processes (Sardana, Shekoochi, & Cornett, 2023). The purpose of employ a qualitative descriptive in this research , to describe how gamification can be designed foster critical thinking among alpha generation students and how these learners experience the development of critical thinking through gamified learning environments. This allowed the researcher to examine students' lived experiences, reflections, and interactions during gamified classroom activities. By focusing on participants' perspectives, the study aimed to gain insights into how gamified environments facilitate engagement, reasoning, and problem-solving processes. Data were collected through two qualitative techniques, observations, interviews. Observations were conducted to observe students' engagement, behaviors, and critical thinking practices during the implementation of gamified learning activities. Interviews with selected students were employed to obtain deeper insights into their perceptions of gamification on learning and critical thinking development. In addition, relevant documents, including student written reflections, and classroom learning artifacts, were collected to provide supporting evidence. The instrument of research employ interview sheet that can be used to collect the data from the sources, and observation sheet to observe students' engagement, behaviors, and critical thinking practices during the implementation of gamified learning activities, and also document to note the point of the interview.

The data collection process was conducted in several stages. Initially, gamified learning activities incorporating elements such as points, levels, and challenges were designed and implemented in alignment with the instructional objectives. Classroom observations were carried out across multiple sessions to identify recurring patterns of student interaction, engagement, and critical thinking behavior. Following the implementation phase, and the interviews were conducted to explore participants' experiences and interpretations of the gamified learning process. Document analysis was subsequently employed to triangulate and substantiate findings derived from observations and interviews. The collected data were using guide by the qualitative data analysis framework according to (Miles, Huberman, and Saldana, 2014) (Miles, 2014). Qualitative data analysis was treated as an interactive and iterative process consisting of three concurrent flows of activity: data condensation, data display, and conclusion. Data condensation

involved selecting, coding, categorizing, and summarizing raw data to develop meaningful analytical units. Data display organizing the condensed data into structured narratives, or visual to facilitate the identification of patterns and relationships. Conclusion involved interpreting emerging themes and validating these interpretations through strategies such as data triangulation, revisiting raw data, and seeking consistency across data sources.

RESULTS AND DISCUSSION

The findings indicate that gamification fosters critical thinking most effectively when it is intentionally designed around cognitively demanding tasks rather than simple recall-based activities. Gamified learning environments that include problem-solving quests, strategy-based challenges, and decision-making scenarios encourage students to analyze information, evaluate alternatives, and justify their choices. Elements such as points, leaderboards, and badges function as motivational tools, but their impact on critical thinking becomes significant when they are integrated with meaningful questions that require reasoning and reflection. Observation data show that well-designed gamification places students in simulated problem contexts where each decision affects outcomes. This design encourages students to think before acting, consider possible consequences, and explain their reasoning. Gamified tasks that require justification, comparison of options, and inference align with core critical thinking skills such as analysis, evaluation, and inference. Collaborative game modes further enhance critical thinking by prompting discussion, debate, and shared problem-solving, allowing students to construct understanding through peer interaction. However, the findings also highlight that gamification must be carefully designed; when tasks are overly simplistic, students tend to focus on winning rather than engaging in deeper thinking. This emphasizes that pedagogical design not the game elements alone is essential in fostering critical thinking among Alpha Generation learners.

Alpha Generation students experience the development of critical thinking through active, reflective, and engaging participation in gamified learning environments. Observation and interview data reveal that students become more analytical during gameplay, particularly when they are required to interpret clues, identify patterns, and evaluate multiple options before making decisions. Students reported that the structure of gamified tasks encouraged them to think carefully about their choices because each action influenced their progress in the game. Students also experienced increased metacognitive awareness, as they reflected on mistakes, adjusted strategies, and attempted challenges repeatedly to improve their performance. The presence of immediate feedback through points and game outcomes helped students recognize errors and understand what needed to be improved. Many students described becoming more curious and asking deeper “why” and “how” questions, indicating a shift toward inquiry-based thinking. Additionally, students experienced critical thinking development through

collaboration and strategic planning. Team-based gameplay required them to exchange ideas, justify opinions, and adapt strategies based on peer input. Gamified learning also enhanced students' confidence in their reasoning abilities, as successfully overcoming challenges reinforced their belief in their capacity to analyze problems and make informed decisions. Overall, Alpha Generation learners experienced gamified learning as an environment that supports critical thinking through active engagement, reflection, strategy adaptation, and meaningful problem-solving.

Table 1. Key Finding and Supporting Evidence Question	Key Findings	Supporting Evidence
How can gamification be designed to foster critical thinking among Alpha Generation students?	Gamification fosters critical thinking when game mechanics are combined with cognitively demanding tasks such as problem-solving, strategy selection, and decision justification. Game elements (points, leaderboards, badges) are effective when they motivate students to analyze, evaluate, and reflect rather than memorize. Collaborative and scenario-based designs further enhance critical thinking.	Classroom observations showed higher engagement during problem-solving quests and strategy-based games. Teachers reported that students explained their reasoning rather than guessing when gamified tasks required justification. Team-based activities promoted discussion, debate, and shared reasoning among students.
How do Alpha Generation students experience the development of critical thinking through gamified learning environments?	Students experience critical thinking development through active participation, reflection, and strategic decision-making. Gamified learning encourages students to analyze clues, evaluate options, adapt strategies, and reflect on mistakes. Immediate feedback and repeated challenges strengthen	Interviews revealed that students thought carefully before making decisions because each choice affected game outcomes. Students reported asking more "why" and "how" questions, adjusting strategies after failure, and gaining confidence in problem-solving through repeated gameplay.

	metacognitive awareness and confidence in reasoning.	
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Overall, the findings confirm that gamification can be a powerful pedagogical approach to enhance critical thinking among Alpha Generation learners. Through competition, challenge, and collaboration, students become more engaged and reflective in their learning process. Which emphasized that gamification increases engagement and cognitive involvement, leading to deeper learning outcomes. Gamification environments stimulate problem-solving and critical thinking skills at the heart of critical thinking. For Alpha Generation, gamification resonates with their natural affinity for interactive and technology-based experiences. This compatibility makes gamification not only engaging but also developmentally relevant for nurturing critical thinking. The integration of gamification in classroom learning effectively promotes the development of critical thinking among Alpha Generation students by combining engagement, collaboration, and reflective practice. However, its success depends heavily on the quality of game design, teacher facilitation, and alignment between game tasks and learning objectives. When implemented thoughtfully, gamification transforms students from passive information receivers into active, reflective, and strategic thinkers a crucial shift for 21st-century education.

This study explored how gamification, particularly through the use of the Undercover game, enhances the critical thinking skills of Alpha Generation students. The findings demonstrate that gamified learning environments effectively promote analytical thinking, problem-solving, collaboration, motivation, and strategic reasoning. These outcomes are highly consistent with recent educational research emphasizing the need for interactive, technology-aligned pedagogies to meet the cognitive characteristics of Alpha Generation learners (Jukić & Škojo, 2021; Hutajulu et al., 2024). One of the most prominent findings is the increase in students' engagement and active participation during gamified learning activities. Observation and interview data show that competitive elements such as points, challenges, and leaderboards encouraged students to focus, participate, and persist in learning tasks. This supports recent findings by (Wibisono, Wahyudin, and Yogiarni, 2024), who reported that gamification enhances students' motivation and active involvement, which are essential precursors to higher-order thinking. For Alpha Generation students who are accustomed to fast-paced digital interaction gamification aligns with their learning habits and helps transform them from passive information consumers into active learners.

The findings also reveal significant development in students' analytical and evaluative thinking skills. During game-based challenges, students were required to analyze clues, evaluate multiple options, justify decisions, and predict outcomes before acting. This aligns with recent research by (Guamanga et al, 2024), which

emphasizes that critical thinking involves the ability to interpret information, evaluate evidence, and make reasoned judgments. Gamified tasks created authentic problem situations that required students to engage in these processes naturally, rather than through rote memorization. Similarly, (Kwangmuang et al, 2024) argue that interactive and scenario-based activities provide meaningful opportunities for students to practice analytical thinking in context. Collaboration and peer interaction emerged as another key factor supporting critical thinking development. Students frequently discussed strategies, shared perspectives, and learned from one another during team-based gameplay. This finding is consistent with (Faradella, Wiyaka, and Egar, 2024), who highlight that higher-order thinking skills are more effectively developed when learners engage in collaborative and inquiry-based activities. For Alpha Generation learners, who are socially connected and accustomed to digital communication, collaborative gamification provides a supportive environment for exchanging ideas and refining reasoning skills.

The use of the Undercover game specifically contributed to students' inferential reasoning and strategic thinking. Students were required to interpret limited information, observe peers' behavior, infer hidden roles, and justify conclusions logically. This supports previous findings by (Pertwi, 2023) and (Rosyidi, 2022), which show that social deduction games strengthen reasoning, inference, and evaluative judgment. In this study, students' ability to plan strategies, adapt decisions, and reflect on outcomes indicates the development of metacognitive awareness, an important component of critical thinking. Another important finding is the increase in students' motivation, persistence, and confidence. Students demonstrated resilience by repeatedly attempting challenges after failure and expressing curiosity about how to improve their performance. Despite these positive outcomes, the study also identified challenges consistent with recent literature. Some students focused excessively on winning rather than learning, and teachers reported difficulties in designing gamified tasks that truly assess critical thinking rather than recall. This finding reinforces Alim and Aisyah's (2025) argument that gamification must be carefully designed to ensure cognitive depth. Without thoughtful instructional planning, gamified activities risk prioritizing entertainment over meaningful learning. Therefore, teacher competence in designing cognitively demanding tasks remains crucial. Overall, the findings of this study confirm that gamification when aligned with clear learning objectives and thoughtful pedagogical design can effectively enhance the critical thinking skills of Alpha Generation students. By integrating challenge, collaboration, reflection, and strategic decision-making, gamified learning environments support the development of higher-order thinking skills required for 21st-century education. These results strengthen recent empirical evidence that gamification is not merely a motivational tool, but a meaningful instructional strategy for fostering critical thinking in digitally native learners.

CONCLUSION

After learning about the results and examining the evidence from the study on the impact of undercover games on exploring analytical skills generation alpha, the research came to the conclusion that the method is good enough to bring on the school activity because it have several benefit but still must be controlled by the educator or teacher. Some people maybe still feel new to this undercover games media but for their argument says that it a good things to applied on education sector, because it help to support the learning. It also can enhance and build some critical thinking skills on the students specially on the new generation alpha. Considering that some people still don't familiar with this game it might be good idea if make some gathering and do some educational counseling on how to use educational games and their application during learning toward preparation new modernization learning on the future. It help teacher to gain knowledge to digital media to learning, gain some information and skills to operate the media gamification learning models. This study explored how gamification can support the development of critical thinking skills among Alpha Generation students through a qualitative approach. Drawing on classroom observations, interviews, and document analysis, the findings show that gamified learning especially through the use of the Undercover game creates meaningful learning experiences that positively influence students' critical thinking abilities.

The findings reveal that gamification helps students become more actively involved in the learning process. During game-based activities, students were not only engaged but also encouraged to think analytically, solve problems, work collaboratively, and make strategic decisions. They learned to examine information carefully, consider different viewpoints, justify their choices, and reflect on the outcomes of their actions. These behaviors reflect essential aspects of critical thinking and emerged naturally through the structure of the gamified tasks. Moreover, students displayed higher levels of motivation, persistence, and confidence, suggesting that gamified learning environments support both cognitive growth and positive learning attitudes. The Undercover game, in particular, played an important role in developing students' inferential reasoning and metacognitive awareness. By requiring students to work with limited information, observe their peers, and adjust their strategies, the game encouraged deeper thinking and self-reflection. This finding highlights the potential of social deduction games as effective instructional tools for promoting higher-order thinking skills, especially for Alpha Generation learners who are familiar with interactive and digital learning environments. However, the study also emphasizes that the success of gamification depends greatly on how it is designed and implemented. Teachers need to carefully plan gamified activities and guide students so that learning objectives especially those related to critical thinking remain the main focus. Without thoughtful instructional design, gamification may lead to shallow engagement that prioritizes winning over meaningful learning. In conclusion, this study confirms that

gamification can be a powerful instructional strategy for enhancing critical thinking skills among Alpha Generation students when used intentionally. By combining challenge, collaboration, reflection, and decision-making, gamified learning can shift students from passive learners to active, reflective, and strate thinkers. Future studies are encouraged to examine the long-term effects of gamification and explore its use across different subjects and educational contexts.

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