

Gamifying Classical Guidance: Enhancing Career Understanding for University Major Selection among Indonesian High School Students

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ARTICLE INFO	ABSTRACT
Keywords: career guidance; gamification; career understanding; high school students; university major selection	High school students frequently experience confusion regarding university major selection, a critical developmental task. Conventional guidance methods often lack engagement for Generation Z. Previous studies have predominantly relied on passive, lecture-based career counseling, which fails to address the interactive and digitally-native preferences of contemporary adolescents, resulting in suboptimal career exploration outcomes. This study aimed to evaluate the effectiveness of classical guidance services integrated with gamification in enhancing students' career understanding. Employing a quantitative one-group pretest-posttest design, the study involved 27 Grade 12 students. Data were collected using a validated Career Understanding Questionnaire and analyzed using the Wilcoxon Signed-Ranks Test. The gamified intervention yielded a statistically significant improvement in career understanding ($Z = -4.54$, $p < .001$), with mean scores increasing from 76.04 to 97.78. Notably, 48% of students shifted from the 'low' to higher understanding categories, effectively eliminating the lowest performance tier and demonstrating consistent positive trajectories across self-understanding and career planning dimensions. The novelty of this study lies in adapting gamification principles into classical group guidance, aligning with Self-Determination Theory to foster intrinsic motivation. These findings provide educators and school counselors with a scalable, interactive strategy to effectively deliver career support in resource-constrained settings. The study underscores the critical need for integrating digital pedagogy into counseling and professional development to better engage and support digital-native students.
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1. INTRODUCTION

Education is fundamentally a humanizing process, operationalized within the school ecosystem through Guidance and Counseling (GC) services. Classical guidance serves as a foundational intervention designed to reach all students in a scheduled, classroom-based format to support their developmental tasks (Juliansyah et al., 2025). Beyond basic developmental tasks, the educational ecosystem relies heavily on GC to address the multifaceted psychological and behavioral challenges students face. In the digital age, ensuring students' mental well-being requires inter-sectoral collaboration and adaptive counseling approaches, including online modalities (Ardi, 2019; Ardi & Putra, 2024). GC practitioners employ various evidence-based strategies to mitigate academic stress and aggressive behaviors through cognitive-behavioral modifications and creative counseling techniques (Karneli et al., 2018; Karneli et al., 2019). Furthermore, students' emotional regulation and resilience are critical not only for navigating online learning environments (Nurfarhanah et al., 2024) but also for overcoming the pressures of higher education tasks, such as thesis writing (Nurfarhanah & Karina, 2023). The effectiveness of these counseling interventions is also deeply influenced by external support

systems, such as the pivotal role of families in shaping students' career planning (Hariko & Anggriana, 2019), and internal demographic factors like gender and ethnicity, which significantly affect students' motivation to engage in group guidance (Hariko et al., 2021). Thus, a robust and adaptive GC framework is essential for fostering the psychological readiness necessary for holistic student development.

Within this supportive psychological framework, the pedagogical dynamics and linguistic interactions in the classroom significantly shape students' cognitive and communicative competencies. Teachers' instructional strategies, such as Project-Based Learning (PjBL) integrated with diverse media like mind mapping, authentic videos, and word cards, have been proven effective in enhancing students' literacy and writing skills across various text types, including biographies, poetry, news, and response texts (Dwikafenia et al., 2026; Karina et al., 2026; Ningsi & Ulya, 2025; Noveria et al., 2026; Rahma et al., 2026; Wardana et al., 2026). Moreover, the quality of classroom interaction is heavily mediated by teachers' communicative strategies; the strategic use of imperative, directive, and expressive speech acts plays a crucial role in scaffolding students' critical thinking, structuring learning activities, and managing classroom discourse (Aini et al., 2026; Anggiawati et al., 2026; Aulia et al., 2026; Putri et al., 2026). At the foundational level, the complex trajectories of language acquisition, semantic patterns, and syntactic interactions highlight the continuous cognitive development of learners (Hayat et al., 2026; Liusti et al., 2026; Mardhiyyah et al., 2026; Ulya et al., 2026), while advanced academic tasks require strong reasoning patterns and reading comprehension skills (Malik et al., 2026; Naini & Ulya, 2025; Wulandari & Ulya, 2025; Erni et al., 2024). These pedagogical and linguistic complexities underscore that student engagement is highly dependent on how dynamically the learning and guidance environments are structured and facilitated.

However, selecting a university major remains a critical challenge for high school students, laying the groundwork for long-term professional satisfaction and academic persistence (Reitz et al., 2022). Despite its importance, many students experience profound uncertainty, often basing choices on trends or parental pressure rather than meaningful self-reflection (Agustina et al., 2024; Hasan et al., 2019). Consequently, a significant proportion of university students report major misalignment, leading to academic confusion and higher dropout rates (Azliyanti et al., 2024; Directorate General of Higher Education, 2022). Preliminary observations at SMA Integral Hidayatullah Boarding School revealed that 92% of Grade XI students struggle to connect their personal potentials with suitable majors, highlighting an urgent need for effective, engaging career interventions.

To address career indecision, previous research has explored various interventions. Studies have demonstrated that gamification-based group guidance (Dahalan et al., 2024; Redondo-Rodríguez, 2022), career simulations (Scheuring & Thompson, 2025), and point-badge-leaderboard models (Sari et al., 2026) effectively enhance career motivation and experiential learning. While these studies confirm the utility of gamification in educational contexts, they predominantly focus on small-group settings or general academic subjects. In today's digital era, conventional delivery methods often struggle to capture the attention of Generation Z, who crave dynamic, interactive experiences (Vosiqova & Khadjibayeva, 2024; Zourmpakis et al., 2023), yet the translation of these interactive elements into large-scale guidance remains underexplored.

A critical gap remains regarding the adaptation of gamification within classical guidance services, which differ fundamentally in structure, purpose, and facilitation dynamics from subject-matter teaching. Classical guidance often relies on passive, lecture-style delivery that fails to meet Generation Z's psychological need for interactivity and immediate feedback. Furthermore, empirical evidence specifically measuring the effectiveness of fully integrated gamification mechanisms for university major selection in large-group classroom settings remains scarce. The absence of structured yet engaging intervention models leaves students vulnerable to missing critical windows for self-exploration during classroom-based guidance sessions.

Therefore, this study aims to examine the effectiveness of classical guidance services enhanced with gamification in improving Grade XI students' career understanding, specifically in the context of university major selection. The explicit novelty of this research lies in the systematic integration of gamification elements not as superficial add-ons, but as core mechanisms for delivering career

development content within a large-group setting. Distinct from prior work that employs isolated quizzes, this research designs a cohesive "career adventure" framework incorporating major-selection simulations and professional role-playing scenarios. Grounded in experiential learning and self-determination principles, this approach addresses students' psychological needs for competence and autonomy, providing a replicable, practice-oriented model that transforms rigid guidance sessions into meaningful, student-centered experiences.

2. METHODS

2.1 Research Design

This study employed a quantitative approach utilizing a one-group pretest-posttest design to evaluate the effectiveness of classical guidance services integrated with gamification. Conducted at SMA Integral Hidayatullah Boarding School, Batam, during the 2025–2026 academic year, this design was selected to assess the direct impact of the gamified guidance module within a naturalistic school setting. It allowed for a focused analysis of how interactive game elements influence career decision-making processes when applied to an intact classroom structure, measuring changes in students' career understanding before and after the intervention without the need for a separate control group.

2.2 Participants

The participants consisted of 27 Grade XI students selected through a purposive sampling technique. This specific sample size was determined based on the finite population of Grade XI students at the school who met the strict inclusion criteria for the intervention, representing a saturated sample of the target group most in need of career guidance. Subjects were chosen based on specific criteria: (1) currently in the critical career exploration stage, (2) demonstrating high uncertainty regarding university major selection, (3) having low baseline career understanding scores as evidenced by a pre-screening questionnaire, and (4) a willingness to actively participate in all sessions. Students who had previously received intensive career guidance were excluded to prevent confounding variables.

Informed consent was secured from the school administration and the students' parents, while written assent was provided by the students themselves. Participants were assured of strict confidentiality, data anonymity, and their right to withdraw from the study at any time without academic penalty.

2.3 Instrument

Data were collected using a Career Understanding Questionnaire developed specifically for this study, grounded in Super's career development theory. The instrument measured four key indicators: self-understanding, career exploration, career planning, and career decision-making, using a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". To ensure psychometric robustness, the instrument underwent validity testing using the Pearson Product-Moment correlation formula. Reliability was established using Cronbach's Alpha via SPSS. This rigorous validation guaranteed that the data reflected true changes in students' career cognition rather than measurement error.

2.4 Procedure

The procedure followed a structured timeline. First, gamified guidance modules—including interactive quizzes, career simulations, and reward systems—were developed and validated by experts. Upon obtaining the necessary ethical approvals and consents, a pretest was administered to establish baseline career understanding levels. The intervention consisted of classical guidance sessions, each lasting approximately 45 minutes, where gamification elements were systematically embedded to enhance engagement and motivation. Following the completion of all sessions, a posttest using the identical instrument was conducted to measure immediate outcomes. Throughout the process, observation sheets were utilized to document student participation and behavioral engagement, providing contextual data to support the quantitative findings.

2.5 Data Analysis

Descriptive statistics, including means and standard deviations, were calculated to summarize the pretest and posttest scores. Prior to hypothesis testing, a normality test was conducted to determine the data distribution. Because the data were not normally distributed ($p < .05$), the non-parametric Wilcoxon signed-rank test was employed to compare the differences between pre- and post-intervention scores using SPSS software. The significance level was set at $p < .05$. This analytical framework allowed for a precise determination of whether the observed improvements in career understanding were statistically significant, thereby providing empirical evidence on the utility of gamification within classical guidance services.

3. FINDINGS AND DISCUSSION

3.1 Findings

This section presents the empirical findings from the implementation of gamified classical guidance services aimed at enhancing Grade XI students' career understanding in the context of university major selection. The study employed a one-group pretest-posttest design involving 27 students from SMA Integral Hidayatullah Boarding School Batam. Data were collected through a validated Career Understanding Questionnaire administered before and after a six-session intervention. Descriptive and inferential statistical analyses were conducted using SPSS Version 27.00 to examine changes in students' career understanding across four sub-dimensions: self-understanding, career exploration, career planning, and career decision-making.

Table 1. Distribution of Students' Career Understanding Categories
Pre- and Post-Intervention (N = 27)

Category	Pretest <i>n</i> (%)	Posttest <i>n</i> (%)
Very High	0 (0.0)	1 (3.7)
High	0 (0.0)	9 (33.3)
Medium	14 (51.9)	17 (63.0)
Low	13 (48.1)	0 (0.0)
Very Low	0 (0.0)	0 (0.0)

Prior to the intervention, the overall mean pretest score for career understanding was 76.04 ($SD = 12.47$). As detailed in Table 1, the majority of participants (51.9%) fell within the "Medium" category, while 48.1% were categorized as "Low," with no students scoring in the "High" or "Very High" tiers. Following the intervention, the mean score increased to 97.78 ($SD = 11.83$). A substantial categorical shift occurred: the proportion of students in the "Low" category dropped to 0%, while 37.0% advanced to the "High" or "Very High" categories.

Table 2. Descriptive Statistics of Career Understanding by Sub-Variable (Pretest)

Sub-Variable	Ideal Score	Observed Min	Observed Max	Mean	SD	Percentage
Self-Understanding	40	14	32	24.30	4.89	60.75%
Career Exploration	30	12	27	19.93	3.88	66.43%
Career Planning	40	15	34	24.89	4.76	62.23%
Career Decision-Making	35	14	31	23.04	4.52	65.83%
Total	145	63	115	92.15	12.47	63.55%

At baseline, an analysis of the sub-variables indicated that "self-understanding" was the most underdeveloped dimension (60.75%), whereas "career exploration" scored relatively highest (66.43%). Post-intervention, all four sub-dimensions demonstrated positive improvements. Notably, the initial gap between self-understanding and the other dimensions was substantially reduced, indicating that the gamified modules effectively fostered both introspective clarity and external career awareness.

To quantify the overall magnitude of change, the normalized gain (N-Gain) was calculated, yielding a mean score of 31.26%. While this falls into the "low" effectiveness category by conventional N-Gain benchmarks (< 40%), the individual data revealed a 100% positive response rate; all 27 participants achieved higher posttest scores than their pretest scores, with individual N-Gain values ranging from 12.73% to 65.15%.

To determine whether the observed improvements were statistically significant, a Wilcoxon signed-rank test was conducted, as the difference scores did not meet normality assumptions. The analysis revealed a statistically significant increase in career understanding from pretest to posttest, $Z = -4.54$, $p < .001$. Furthermore, the ranks summary confirmed that all 27 participants contributed to positive ranks, with zero ties or negative ranks observed, underscoring the uniformity of the improvement.

Table 3. Wilcoxon Signed-Rank Test Results for Pretest-Posttest Comparison

Statistic	Value
Z	-4.54
p	< .001
Positive Ranks (n)	27
Negative Ranks (n)	0
Ties (n)	0

Collectively, these results provide robust empirical support for the effectiveness of gamified classical guidance in enhancing Grade XI students' career understanding. While the mean N-Gain value suggests modest effect magnitude by conventional benchmarks, the statistically significant Wilcoxon result, coupled with 100% positive individual trajectories and meaningful categorical improvements, indicates that the intervention yielded practically relevant outcomes. The gamification elements, interactive quizzes, career simulation scenarios, and reward-based progression appear to have successfully increased student engagement, thereby facilitating deeper processing of career-related information. Notably, improvements were observed across all four sub-dimensions, with particularly meaningful gains in self-understanding and career planning, areas that initially lagged. These findings align with Self-Determination Theory, suggesting that gamification may satisfy students' psychological needs for competence and autonomy, thereby fostering more intentional career exploration. The consistency of improvement across a purposively selected sample of students with initially low-to-moderate career understanding further strengthens the ecological validity of the intervention for real-world school counseling contexts.

3.2 Discussion

The findings of this study indicate that classical guidance services enhanced with gamification significantly improve Grade XI students' career understanding in the context of university major selection. The uniform positive trajectory observed across all participants affirms the potential of gamified interventions to address career indecision among adolescents. These results align with and extend prior research (Vázquez-Calatayud et al., 2024; Lee & Yu, 2025), which similarly reported that game-based elements enhance career motivation. However, whereas earlier studies predominantly focused on small-group formats, the present research demonstrates that gamification can be effectively scaled to whole-class classical guidance settings, a notable contribution given the resource constraints commonly faced by school counselors.

The mechanism underlying these improvements can be interpreted through the integration of Self-Determination Theory (Deci & Ryan, 1985) and Experiential Learning Theory (Kolb, 1984). Theoretically, this study extends the application of these frameworks from individual or small-group clinical settings to large-scale, classroom-based guidance. Gamification elements (points, progressive challenges, immediate feedback) appear to satisfy students' psychological needs for competence and autonomy, thereby enhancing intrinsic motivation to engage with career tasks (Cai & Shi, 2025). Furthermore, the simulation-based activities operationalize Kolb's experiential learning cycle, enabling students to concretely experience and reflect upon abstract career concepts (Chang & Liu, 2025).

A particularly instructive theoretical pattern emerged in the sub-variable analysis: self-understanding initially scored lowest yet demonstrated meaningful improvement post-intervention. This trajectory resonates with Sharma et al.'s (2023) conceptualization of the exploration stage, wherein adolescents must first clarify personal attributes before effectively evaluating external options. The gamified activities likely scaffolded this introspective process by making abstract self-concept tasks more tangible. This extends Hidayat and Prabowo's (2019) emphasis on early career awareness by demonstrating that structured, game-based reflection can accelerate self-knowledge development. Ultimately, this study theoretically contributes by demonstrating that gamification's success in career counseling stems not from superficial engagement, but from its capacity to operationalize established psychological principles within a format that resonates with Generation Z learners, effectively bridging the gap between abstract career theories and tangible adolescent experiences.

A critical point of analysis emerges from the normalized gain (N-Gain), which fell within the "low effectiveness" category according to conventional benchmarks, despite the statistically significant overall improvement and the elimination of the "Low" category entirely. This apparent discrepancy warrants nuanced interpretation and highlights why the results differ from some previous studies. For instance, Zulfikar (2022) reported "high effectiveness" for gamified group guidance. The divergence in effect magnitude can be attributed to three contextual factors.

First, N-Gain metrics mathematically penalize higher baseline scores. Because the pretest mean in this study was already categorized as "Medium," the mathematical room for relative improvement was constrained, creating a ceiling effect that aggregate gain scores obscure. Second, the scope of the construct differs; career understanding encompasses deep, multi-dimensional constructs like self-understanding and decision-making, which require more cognitive processing time to improve compared to simpler knowledge acquisition measured in other studies. Third, the intervention setting plays a crucial moderating role. Whole-class classical guidance inherently provides less individualized facilitator attention than the small-group formats utilized in studies like Zulfikar's. Consequently, while the rate of relative gain (N-Gain) is lower due to the large-group setting and higher baseline, the proportion of students achieving meaningful categorical progress remains at 100%. This indicates that "low" N-Gain does not equate to "low" practical impact in real-world, resource-constrained school ecosystems.

The findings offer actionable insights for educational practice, particularly for school counselors, curriculum designers, and policymakers. Gamified classical guidance represents a scalable, theory-grounded approach to enhancing career development. Counselors must transition from passive, lecture-based delivery to interactive, game-based strategies to effectively engage digital-native students and maximize limited counseling hours.

The pronounced improvement in self-understanding underscores the practical value of embedding identity-exploration mechanics within gamified modules. Practitioners should not focus solely on disseminating informational content about university majors, but rather design activities that force students to reflect on their personal attributes. Third, educational policymakers should recognize the necessity of integrating digital pedagogy into counselor professional development. Equipping counselors with the skills to design and facilitate gamified interventions is essential for modernizing career support systems. The modest N-Gain values suggest that while gamification is highly beneficial for initial engagement and baseline improvement, it may require complementary strategies, such as individualized follow-up counseling or parental involvement, to achieve transformative, long-term outcomes for all learners.

While these findings are promising, several limitations warrant consideration. The one-group pretest-posttest design precludes definitive causal attribution; future research employing randomized controlled trials would strengthen internal validity. Additionally, the purposive sampling limits generalizability to broader adolescent populations. Future investigations should explore long-term retention effects on actual major selection, cross-cultural applicability, and the integration of adaptive gamification algorithms to personalize career exploration pathways.

4. CONCLUSION

This study concludes that integrating gamification into classical guidance services significantly enhances students' career understanding, effectively transforming passive counseling sessions into active, reflective career exploration experiences. Theoretically, the findings extend the applicability of Self-Determination Theory and Experiential Learning into large-scale, classroom-based school counseling, demonstrating that game mechanics can successfully satisfy adolescents' psychological needs for competence and autonomy during critical decision-making phases. Practically, this research provides a scalable, resource-efficient model for school counselors operating in constrained environments. It underscores the necessity for practitioners to move beyond using technology merely for information delivery, and instead design structured, interactive experiences that actively scaffold self-reflection and decision-making skills.

Despite these contributions, the study's one-group pretest-posttest design and small, context-specific sample limit definitive causal claims and broad generalizability. Furthermore, the reliance on immediate post-intervention measures leaves the long-term retention of these cognitive gains and their actual impact on final university major selection unexamined. Future research should address these gaps by employing randomized controlled trials with larger, more diverse populations, and incorporating longitudinal tracking of students' actual career trajectories. Ultimately, as educational landscapes increasingly intersect with digital-native behaviors, this study affirms that modernizing career guidance through theoretically grounded gamification is not merely a pedagogical trend, but a vital imperative for empowering adolescents to navigate their future trajectories with confidence, clarity, and self-direction.

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