

 Research Article

Students' Perceptions of Innovative Teaching Strategies: Reflection, Gamification, and Mindfulness in the Classroom

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Abstract

In the context of higher education, where student engagement and motivation are central concerns, innovative teaching strategies that represent a holistic, student-centered approach to teaching are needed. This study aims to examine university students' perceptions of three innovative teaching strategies integrated into classroom practice—weekly individual reflections, gamification using Quizizz, and one-minute silent mindfulness sessions before class. The study also investigates how these methods influence students' engagement, focus, and perceived learning. A mixed-methods design was employed, combining quantitative survey data from a structured Likert-scale questionnaire (18 items) with qualitative responses from three open-ended questions, administered to 61 undergraduate students enrolled in a Research Methodology course at a university in Cambodia during the 2024–2025 academic year. Quantitative data were analyzed using descriptive statistics, and qualitative reflection data from open-ended questions were thematically analyzed. The quantitative analysis indicated that all three strategies contribute to a positive and effective classroom environment. Further qualitative analysis showed they significantly enhanced comprehension, recall, and focus. Specifically, reflection deepened understanding and increased awareness of knowledge gaps. Quizizz supported immediate recall and application. The one-minute silence activity promoted mental preparation and focus. Collectively, these strategies boosted students' motivation, focus, and cognition by increasing intrinsic drive, improving concentration, reducing stress, and supporting deeper understanding and self-assessment. Students are highly satisfied with the innovative learning strategies, affirm their effectiveness, and support their continuation. Suggestions for improvement focused on the classroom environment (e.g., reducing distractions and adjusting pacing) and on activity modifications (e.g., easing Quizizz-related anxiety and extending silence periods). The article concludes with recommendations and suggestions for practical implications.

Keywords: Innovative Teaching Strategies, Student Motivation, Gamification, Reflection, Mindfulness in Education

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1. INTRODUCTION

In today's rapidly changing educational landscape, higher education institutions are increasingly called upon to adopt innovative pedagogical approaches that foster meaningful learning experiences. The aim is to enhance student engagement, improve learning outcomes, and foster the development of essential academic and professional skills. This manuscript examines students' perceptions of three distinct yet complementary pedagogical approaches—reflection, gamification, and mindfulness (specifically, silent practices)—that support a more holistic and student-centered learning experience.

Reflection is foundational to effective learning, rooted in the philosophy that “*We do not learn from experience. We learn from reflecting on experience.*” (Dewey, 1933). According to Boyd and Fales (1983), reflection is defined as a conscious, purposeful activity intended to reconstruct experience. Reflection is an internal

examination that clarifies meaning and enables a changed conceptual perspective. It serves as a core component of experiential education, linking experience with derived meaning and requiring practice before, during, and after an event to anticipate, process, and consolidate learning (Boud et al., 1985; Denton, 2011). Developing these skills is essential for professional growth, as the ability to reflect in complex situations. This skill distinguishes experts from novices (Schon & DeSanctis, 1986). Ash and Clayton (2009) emphasized three major roles of this analytical process: generating learning (by articulating questions and confronting assumptions), deepening learning (by challenging conclusions and prompting integrative questioning), and documenting learning (by producing evidence of new understanding). All these benefits were supported by recent studies. For instance, research found that reflection assignments can improve grades, encourage spaced study for long-term retention (Gravett, 2018; Khalafi et al., 2024), boost students' Habits of Mind (Frank, 2023), and influence deeper metacognitive thinking, increased effort, and improved self-efficacy (Cavilla, 2017).

The other strategy that has been integrated into education is gamification—the application of game elements in non-game contexts (Caponetto et al., 2014; Yildirim, 2017). These tools have been widely adopted to enhance motivation and engagement. Research consistently shows that integrating gamification boosts academic performance and motivation and fosters a positive attitude toward learning across all educational levels (Manzano-León et al., 2021; Zeybek & Saygi, 2023). Tools like Quizizz are highlighted for their effectiveness, using features such as leaderboards and instant feedback to create a fun, low-pressure learning space that sustains attention (Anak Yunus & Hua, 2021). Furthermore, quiz performance is often a strong predictor of exam outcomes, supporting formative assessment and content mastery (Pum, 2025). However, significant concerns—the “dark side”—must be addressed, including the potential for extrinsic rewards to undermine intrinsic motivation, increased competition, addiction risks, and ethical issues related to surveillance and data integrity (Nyström, 2021; Kwon & Özpolat, 2021).

Moving to another innovative strategy—Mindfulness and silence are increasingly viewed as powerful educational tools that enhance students' cognitive and emotional development. Intentional silence is an active, transformative phenomenon that supports students' readiness to learn (Nayagam, 2025) and contributes to deep learning by actively countering overstimulation in modern learning environments (Creely & Waterhouse, 2024). In addition, silence has also been found to enhance neurogenesis and strengthen self-regulation and attentional skills (Dulčić, 2021). Previously, practices like the Montessori Silence Game had been found to foster spiritual nourishment and self-awareness (Haskins, 2011), while modern studies link engagement in contemplative routines to the development of 21st-century competencies (the 4Cs: creativity, critical thinking, communication, and collaboration) (Kos, 2025). Nyana et al. (2024) further found that practices like silent sitting significantly predict academic achievement. This study suggests that silence relieves stress and improves focus, which further enables more effective learning.

1.1. The Current Study

The conceptual framework for this study (Figure 1) positions three innovative teaching strategies—weekly individual reflection, gamification through Quizizz, and one-minute mindfulness practice—as key instructional approaches that may shape students' perceptions of their learning experiences. These strategies are hypothesized to influence three perceptual factors: engagement, motivation, and focus, which collectively contribute to students' perceived learning outcomes.

While a robust literature supports the individual benefits of reflection (metacognition), gamification (motivation/assessment), and mindfulness (emotional/attentional regulation), there is a recognized gap in understanding students' concurrent perceptions of these diverse strategies when implemented within a single, innovative learning experience. This study seeks to explore how students perceive the effectiveness and relevance of three innovative classroom strategies—individual reflection, gamification (Quizizz), and mindfulness (one-minute silence)—implemented in a university course. By capturing both quantitative survey data and qualitative reflections, the study aims to obtain a holistic understanding of how these approaches influence students' learning experiences. The specific objectives of this study are to:

1. To examine students' perceptions of individual reflection activities on their self-awareness and learning.
2. To explore how students perceive gamification (Quizizz) as a motivational learning tool.

3. To investigate students' views on one-minute silent mindfulness before class and its impact on focus and readiness to learn.
4. To identify overall attitudes and preferences toward these teaching approaches.

Guided by these objectives, the study addresses the following research questions:

1. How do students perceive the usefulness of weekly reflection activities for their learning?
2. What are students' perceptions of gamification (Quizizz) in promoting engagement and motivation?
3. How do students perceive the one-minute silent practice before class in enhancing focus and emotional readiness?
4. Which of these strategies do students find most beneficial, and why?

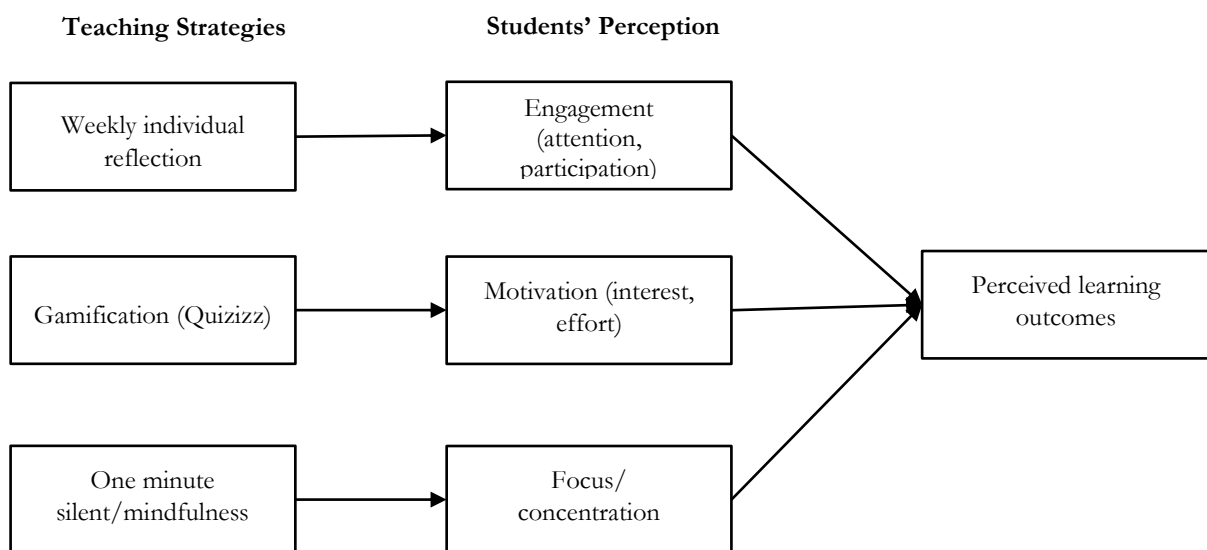


Figure 1. Conceptual Map of Innovative Teaching Strategies, Student Perceptions (Engagement, Motivation, Focus), and Perceived Learning Outcomes

1.2. Literature Review

1.2.1. Reflection as a Teaching Strategy

We do not learn from experience. We learn from reflecting on experience.

– John Dewey (1933)

According to Dewey (1933), reflection is described as a conscious, purposeful reflective activity aimed at reconstructing experience. It requires learners to describe what happened, address emotions that shape understanding, and make sense of new ideas. Boyd and Fales (1983) further define reflective learning as an internal examination of an experience that clarifies meaning and leads to a changed conceptual perspective. It is a core component of experiential education, linking students' experiences with the learning and meaning they derive from them (Denton, 2011). Reflection is needed before, during, and after an experience: to anticipate what is coming, to process the many inputs and emotions that arise, and to consolidate learning afterward (Boud et al., 1985). It is not simply introspection, but an evidence-based and analytical process that helps students generate, deepen, critique, and document learning. Developing reflective skills is also essential for academic and professional growth, as the ability to reflect in complex or unfamiliar situations is a key trait that separates expert practitioners from novices (Schon & DeSanctis, 1986). There are three major roles of reflection as emphasized by Ash and Clayton (2009): first, it generates learning by helping students articulate meaningful questions, confront their assumptions, analyze cause-

and-effect relationships, compare theory with real-world practice, and connect personal experiences to broader systemic issues. Second, it deepens learning by challenging superficial conclusions, encouraging consideration of alternative viewpoints, and prompting integrative “why” questioning. Finally, reflection documents learning by producing concrete evidence of new understanding that can be evaluated and used for feedback (Ash & Clayton, 2009).

Furthermore, the recent study that integrates weekly online reflection intended to foster students' note-taking during class discussion has found additional unintended benefits of this assignment reported by the students, such as helping the students to review the course material, extend discussion beyond the classroom, and help them improve their grade (Gravett, 2018). The weekly online reflection pushes the students to revisit course content, identify key points, and engage in spaced study. This action further supports long-term retention (Khalafi et al., 2024). This assignment also gives the students the opportunity to read their peers' reflections, allowing them to encounter new perspectives and new ideas they may have overlooked during class. More than that, the activity offered a sense of relief and an accessible way to strengthen students' overall performance, especially in a challenging course. This is because students can also reuse their notes from reflections when preparing for quizzes and exams (Gravett, 2018). Similarly, Frank (2023) has designed a course that integrates a weekly reflection assignment for students intended to foster students' confidence and equip them with the transferable ability to take charge of their own learning. As a result, informal weekly reflections have been found to significantly boost students' Habits of Mind (e.g., metacognition, flexible thinking, clear communication) by promoting ownership of learning and confidence in their ideas. Additionally, this is evident in the study by Cavilla (2017), with the qualitative data revealing that student reflection influences most students' deeper metacognitive thinking, increased effort, greater motivation, and improved self-efficacy, with some showing significant individual academic growth.

1.2.2. Gamification in Education

Gamification was integrated into education years ago. Researchers, practitioners, and educators worldwide have been paying attention to gamification in training and putting it into practice in the classroom to enhance students' learning outcomes (Caponetto et al., 2014; Yildirim, 2017). The term “gamification” has been defined as the use of game elements in non-game contexts (Caponetto et al., 2014; Dicheva et al., 2015; Yildirim, 2017). Both Caponetto et al. (2014) and Yildirim (2017) found that integrating gamification in education boosts students' academic performance, engagement, motivation, and enhances a positive attitude toward learning. These findings are further confirmed by many studies globally. Specifically, Manzano-León et al. (2021) and Zeybek and Saygi (2023) found that gamification positively impacts students' engagement, motivation, and learning outcomes at all educational levels. Furthermore, recent research has found that gamification has the potential to develop twenty-first-century skills. When thoughtfully implemented, gamification can significantly foster 21st-century skills. Features that encourage collaboration enhance teamwork, story-based challenges promote critical thinking, and combining gamification with problem-based learning develops problem-solving abilities. Gamified digital settings also support the growth of digital literacy (Pum et al., 2025).

Despite the claim that gamification can enhance problem-solving, collaboration, communication, and engagement, there were also concerns regarding distraction, increased competition, and failure to meet diverse learner needs. Rabah et al. (2018) argued that while research often reports positive cognitive, motivational, and behavioral effects, significant gaps and limitations exist around missing context because most studies frequently overlook how learning objectives and the quality of activities influence outcomes; context bias and publication bias since evidence is heavily concentrated in the STEM context, and review literature suggests an overrepresentation of positive results in published studies. Additionally, previous research revealed that the implementation of assessment gamification resulted in significantly lower outcomes across several measures for the gamified group: content knowledge, satisfaction, and course experience (Kwon & Özpolat, 2021). Several potential negative consequences (“dark sides”) of using gamification that educators and designers must actively address are further exemplified by Nyström (2021). The key areas of concern were motivation issues since gamification tools are based on extrinsic rewards. This nature of the gamification feature can undermine intrinsic motivation, distract learners, and encourage competition or cheating. Moreover, addiction risks were also mentioned. The gamified systems, especially those inducing “flow,” may trigger addictive behaviors, and competitive elements (e.g., leaderboards) can

decrease collaboration, harm productivity, and undermine shared goals. The users may also feel manipulated by systems that influence behavior in covert ways. Another concern is data integrity issues, as the system's collection of sensitive user data poses a risk of misuse. A subsequent factor involves surveillance and privacy; with the visibility of scores or rankings, users may feel monitored or pressured. Finally, an often-overlooked dimension is that ethical/exploitative practices can potentially reinforce neoliberal or exploitative systems (e.g., pushing for more work without compensation).

1.2.3. Quizizz: A Gamification Tool

In this theme, we focus on the specific gamification tool “Quizizz,” which has recently transitioned into Wayground, emphasizing the growing demand for digital learning tools that effectively combine interactivity, assessment, and motivation (Quizizz Inc, 2025). Gamified platforms like Quizizz are consistently shown as meaningful responses to 21st-century learners. This tool incorporates features such as leaderboards, memes, timers, and instant feedback that create a fun, low-pressure learning space (Anak Yunus & Hua, 2021). These design elements are crucial for sustaining attention and enabling students to engage with content through gameplay rather than traditional assessment. Studies confirmed that Quizizz is effective in improving academic performance and sustaining engagement, particularly in ESL and language learning contexts, where its game-like format makes the necessary repetitive practice more enjoyable and less stressful (Anak Yunus & Hua, 2021; Degirmenci, 2021). Furthermore, studies in Arabic and English classrooms show that students become more active, attentive, and motivated when Quizizz is used, especially near the end of lessons when fatigue is high (Ju & Adam, 2018; Irwansyah & Izzati, 2021). While comparative gamification research suggests Quizizz sometimes yields slightly lower academic gains compared to non-gamified instruction or other platforms, students consistently reported positive subjective experiences (Göksün & Gürsoy, 2019), and both Quizizz and Kahoot have been found to significantly outperform traditional tools like Google Forms in boosting enjoyment, motivation, and perceived learning (Chaiyo & Nokham, 2017). Beyond motivation, recent research underscores the role of game-based quizzes in formative assessment; for instance, weekly quiz performance on platforms like Quizizz has been found to be a strong predictor of exam outcomes, reinforcing content mastery and monitoring progress (Pum, 2025). The platform's ability to provide immediate feedback also makes it valuable for early intervention, and its potential is further expanded by the integration of AI-generated quizzes, which reduce instructor workload and sustain high engagement, with lower quiz scores continuing to serve as early warning indicators for teaching adjustments (Durgungoz & Durgungoz, 2025).

1.2.4. Mindfulness and Silent Practices in the Classroom

Intentional silence, mindfulness, and contemplative pauses are increasingly recognized by research as powerful educational tools that enhance students' cognitive, emotional, and social development across all learning contexts (Creely & Waterhouse, 2024; Dulčić, 2021; Nayagam, 2025). This body of work reframes silence not as the absence of noise but as an active, intentional, and transformative phenomenon that significantly improves the learning environment. For instance, brief structured silence has been shown to support students' readiness to learn in higher education, with observational studies demonstrating that simple reflective pauses, such as a one-minute silent prayer (Nayagam, 2025), can improve concentration, emotional regulation, and interpersonal relationships over time by shifting students into a state of focus. The wider literature supports this view, arguing that intentional silence facilitates deep learning, artistic expression, and meaning-making (Creely & Waterhouse, 2024), countering the prevalent overstimulation in modern, digital learning environments. On a neurophysiological level, silence has been found to enhance neurogenesis and strengthen self-regulative attentional skills (Dulčić, 2021), providing a strong rationale for its use as a tool for contemplation and competence-based learning. Furthermore, historical pedagogical practices, such as the Montessori Silence Game and Zen-inspired practices (Haskins, 2011), illustrate how embedding silence nurtures the “inner experience” and self-awareness, while more recent studies highlighted its role in fostering inclusive and critically engaged pedagogy by encouraging active listening and expanding agency and voice (Lausch, 2018). Finally, the use of contemplative routines in early childhood education strengthens critical twenty-first century competencies like creativity and collaboration (Kos, 2025), with empirical findings directly connecting silent practices, such as silent sitting, to improved academic achievement by alleviating stress and enhancing focus (Nyana et al., 2024).

2. METHODOLOGY

2.1. Research Design

This study employed a mixed-methods design to explore undergraduate students' perceptions of three innovative teaching strategies: weekly individual reflections, gamification using Quizizz, and one-minute silence. Quantitative data were collected through a structured questionnaire, which included Likert-scale items measuring students' perceptions of reflection, Quizizz, and a one-minute silent activity. To complement the quantitative data, three open-ended questions were included in the questionnaire to gather students' qualitative insights into their experiences with the three strategies. The combination of quantitative and qualitative approaches allowed for a holistic understanding of how reflection, gamification, and one-minute silent activities influence students' learning experiences.

2.2. Participants and Research Setting

Table 1 presents the demographic information of the respondents. This study was conducted during the second semester of the 2024–2025 academic year at a private university in Battambang province, Cambodia. The participants were all those students who were enrolled in the Research Methodology course and had experience with the three strategies used, namely, reflection, Quizizz, and one-minute silence. These three strategies were introduced into this class from the first week of the course. This class was a weekend class, with 15 weeks (45 hours in total, 3 hours per week). In this study, no sampling techniques were required since the study aimed to explore the perceptions of the entire class by inviting all the students to participate in this study. The survey was conducted in class during the last week of the course to maximize the number of participants. Finally, the total number of participants who completed the questionnaire was 61 (65.59%) out of 93 students in total from the researcher's class. The participants were 60.70% female, and 39.30 % were male. Most of them (42.60%) were 20 years old, 18% were 19 years old, and another 18% were 21 years old. Participants were third-year undergraduate students from three different majors: Banking, Management, and Marketing (29.50%, 37.70%, 32.80%, respectively). Among all of them, 21.31% reported that they were never absent from this class, 16.39% absent only one time, 22.95% absent two times, 26.23% absent three times, followed by 8.20% absent four times, and around 5% absent five times or more. Participation was voluntary, and all responses were collected anonymously.

Table 1. Demographic Information of Participants

Demographic	Value	Frequency	Percentage
Gender	Female	37	60.70
	Male	24	39.30
Age	19 years old	11	18.00
	20 years old	26	42.60
	21 years old	11	18.00
	22 years old	2	3.30
	23 years old	2	3.30
	24 years old	2	3.30
	25 years old	2	3.30
	26 years old	2	3.30
	27 years old	1	1.60
	29 years old	1	1.60
Major	34 years old	1	1.60
	Banking	18	29.50
	Management	23	37.70
Number of absences	Marketing	20	32.80
	Never absence	13	21.31
	1 time	10	16.39
	2 times	14	22.95
	3 times	16	26.23
	4 times	5	8.20
	5 time	2	3.28
	More than 5 times	1	1.64

2.3. Instrument

A structured questionnaire was developed by researchers for the current study based on the review of the literature to measure students' perceptions of three teaching strategies integrated into the classroom: (a) weekly individual reflection (3 items), (b) gamified quizzes using Quizizz (4 items), (c) a one-minute silent practice before class (8 items), and (d) Perception of the three combination strategies (3 items). The instrument was developed based on a review of prior studies on reflective practice (Ash & Clayton, 2009; Cavilla, 2017; Gravett, 2018), gamification and Quizizz in educational settings (Anak Yunus & Hua, 2021; Manzano-León et al., 2021), and mindfulness and intentional silence in the classroom (Dulčić, 2021; Nayagam, 2025; Nyana et al., 2024). A total of 18 items were rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Four negatively worded items were included in the questionnaire (items 2, 3, 5, and 6 of the one-minute silent activity subscale), which were reverse-coded prior to analysis to ensure consistent interpretation across all items. The minimum possible score for each participant was 18 (all items rated 1), and the maximum possible score was 90 (all items rated 5). Reverse-coded items were included in the subscale to reduce response bias. Additionally, the questionnaire included three optional open-ended questions to collect qualitative reflection insights into students' experiences, perceptions, and suggestions regarding the teaching strategies. The first part of the questionnaire, demographic information (year of study, age, and gender), was also collected for descriptive purposes.

2.4. Data Collection Procedure

We administered the survey questionnaire at the end of the class to maximize participation and ensure that participants were fully familiar with all the strategies used in the class. Before administering the survey, all students were informed about the purpose of the study, and the voluntary nature of participation was emphasized. Each participant spent around 15 minutes completing the survey questionnaire. Responses were collected anonymously, and students were encouraged to answer honestly. In addition, at the end of the questionnaire, three open-ended questions were included to allow participants to provide more detailed feedback on their experiences with the teaching strategies.

2.5. Data Analysis

The quantitative data collected from the Likert-scale items were first coded numerically from 1 (Strongly Disagree) to 5 (Strongly Agree). Items that were negatively worded or reverse-coded were recorded to ensure consistency in interpretation. Descriptive statistics, including means, standard deviations, and frequency distributions, were computed to summarize students' perceptions of each teaching strategy. All quantitative analyses were conducted using IBM SPSS Statistics (Version 27). The internal consistency of each subscale was assessed using Cronbach's alpha to evaluate the reliability of the instrument. Additionally, qualitative responses from the open-ended questions were analyzed thematically. All responses were carefully read, and key ideas were coded and grouped into broader themes that reflected students' perceptions, experiences, and suggestions. Representative quotations were selected to illustrate common patterns and provide deeper insights that complemented the quantitative findings.

2.6. Ethical Considerations

The survey questionnaire was administered anonymously, and no identifying information was collected. Participants were fully informed about the purpose of the study and the intended use of the data for research and teaching improvement. On the cover page of the survey questionnaire, we clearly stated that by completing the questionnaire, students provided implied consent to participate. All data were handled confidentially, and results were reported in aggregate form to protect individual identities. All the participants were informed that they could withdraw from their participation at any time without providing any reasons and with no consequences.

3. RESULTS

3.1. Quantitative Findings

3.1.1. Distribution Indices and Reliability Analysis

The normal distribution indices and reliability estimate for all measurement items were analyzed. Skewness values (-0.91 to 0.20) and kurtosis values (-0.87 to 1.37) remained within acceptable thresholds, indicating that the data did not substantially deviate from a normal distribution. Internal consistency was evaluated using Cronbach's alpha, and all subscales—reflection, gamification, mindfulness, and a combination of three strategies demonstrated satisfactory reliability (0.68, 0.69, 0.82, 0.79, respectively). Reverse-coded items were adjusted prior to analysis.

3.1.2. Perceptions of Individual Reflection Activities

Table 2 presents students' perceptions of individual reflection activities. Students generally reported positive perceptions toward the reflection activities (4.26, SD = 0.64). The highest mean ($M = 4.34$, $SD = 0.66$) was observed in the statement "*The weekly reflection tasks help me identify what I have learned each week*", followed by "*Writing reflections makes me more aware of my learning strengths and weaknesses*" ($M = 4.28$, $SD = 0.55$). In addition, the reflection task was found to encourage students to think more deeply about the lessons ($M = 4.15$, $SD = 0.73$).

Table 2. Students' Perceptions of Individual Reflection Activities

Attributes	Level of agreement (%)					Mean	SD
	1	2	3	4	5		
1. The weekly reflection tasks help me identify what I have learned each week.	0.00	1.64	4.92	50.82	42.62	4.34	0.66
2. Writing reflections makes me more aware of my learning strengths and weaknesses.	0.00	0.00	4.92	62.30	32.79	4.28	0.55
3. The reflection tasks encourage me to think more deeply about the lessons.	0.00	3.28	9.84	55.74	31.15	4.15	0.73
Overall	0.00	1.64	6.56	56.28	35.52	4.26	0.64

3.1.3. Perceptions of Gamification (Quizizz) Activities

The results from Table 3 revealed that gamification (Quizizz) has a positive impact on students' learning and motivation ($M = 4.15$, $SD = 0.64$). A significant majority of the students (90.16%) reported that the immediate feedback from Quizizz helps them understand their mistakes ($M = 4.28$, $SD = 0.69$) and makes learning more enjoyable than traditional quizzes ($M = 4.16$, $SD = 0.64$). Additionally, students also reported that Quizizz activities motivate them to learn more both before and after the class ($M = 4.08$, $SD = 0.49$), while also reporting that they were more likely to focus during the Quizizz activities than during regular lessons ($M = 4.07$, $SD = 0.75$).

Table 3. Students' Perceptions of Gamification (Quizizz) Activities

Attributes	Level of agreement (%)					Mean	SD
	1	2	3	4	5		
1. Quizizz makes learning more enjoyable than traditional quizzes.	0.00	0.00	13.11	57.38	29.51	4.16	0.64
2. Quizizz motivates me to study more before or after class.	0.00	0.00	8.20	75.41	16.39	4.08	0.49
3. The immediate feedback from Quizizz helps me understand my mistakes.	0.00	1.64	8.20	50.82	39.34	4.28	0.69
4. I find myself more focused during Quizizz activities than during regular lessons.	0.00	1.64	19.67	49.18	29.51	4.07	0.75
Overall	0.00	0.82	12.30	58.20	28.69	4.15	0.64

3.1.4. Perception of a One-Minute Silent Activity

According to Table 4, the result from the "Students' perception of a One-minute silent activity" section indicated that students have a positive perception of the One-minute silent activity ($M = 4.18$, $SD = 0.68$). Most of the students (91.81%) reported that the one-minute silence practice before class starts helps them calm their minds ($M = 4.23$, $SD = 0.59$) and helps create a peaceful classroom atmosphere ($M = 4.07$, $SD = 0.60$). Furthermore, the students were more ready to focus on learning after the one-minute silent practice ($M = 4.02$, $SD = 0.70$). They would also like to continue having the one-minute silent practice in future classes ($M = 4.20$, $SD = 0.68$), indicating the positive favorability of the activity.

Table 4. Students' Perception of a One-Minute Silent Activity

Attributes	Level of agreement (%)					Mean	SD
	1	2	3	4	5		
1. The one-minute silence practice helps me calm my mind before class starts.	0.00	0.00	8.20	60.66	31.15	4.23	0.59
2. I find the silent minute awkward. (R)	0.00	3.28	13.11	52.46	31.15	4.11	0.75
3. I find the silent minute unnecessary. (R)	0.00	3.28	18.03	44.26	34.43	4.10	0.81
4. After the silent practice, I feel more ready to focus on learning.	0.00	0.00	22.95	52.46	24.59	4.02	0.70
5. The silence before class makes me bored. (R)	0.00	0.00	9.84	40.98	49.18	4.39	0.67
6. The silence before class makes me uncomfortable. (R)	0.00	1.64	4.92	52.46	40.98	4.33	0.65
7. The silent moment helps create a peaceful classroom atmosphere.	0.00	0.00	14.75	63.93	21.31	4.07	0.60
8. I would like to continue having the one-minute silent practice in future classes.	0.00	0.00	14.75	50.82	34.43	4.20	0.68
Overall	0.00	1.02	13.32	52.25	33.40	4.18	0.68

3.1.5. Perception of the Three Combination Strategies

The result from Table 5 shows that the students express a positive perception toward the combination of the teaching strategies ($M = 4.04$, $SD = 0.63$). Specifically, the majority of the students reported that the combination of reflection, Quizizz, and silent practice has improved their learning experience ($M = 4.15$, $SD = 0.60$), while making the class more engaging and motivating overall ($M = 4.03$, $SD = 0.55$). The students showed their enthusiasm to recommend these strategies to be used in other classes ($M = 3.93$, $SD = 0.73$).

Table 5. Students' Perception of the Three Combination Strategies

Attributes	Level of agreement (%)					Mean	SD
	1	2	3	4	5		
1. The combination of reflection, Quizizz, and silent practice has improved my learning experience.	0.00	0.00	11.48	62.30	26.23	4.15	0.60
2. I would recommend these strategies to be used in other classes.	0.00	3.28	19.67	57.38	19.67	3.93	0.73
3. These strategies make the class more engaging and motivating overall.	0.00	0.00	13.11	70.49	16.39	4.03	0.55
Overall	0.00	1.09	14.75	63.39	20.77	4.04	0.63

3.2. Qualitative Findings

The qualitative analysis yielded rich insights into student perceptions of the three learning strategies: Weekly individual reflection, gamification integration using Quizizz, and the one-minute silence activity. Thematic analysis of the 61 responses resulted in the identification of three major themes: (1) Perceived benefits of learning activities, (2) Impact of learning strategies on student engagement and cognition, and (3) Student feedback on instructional methods and environment.

3.2.1. Perceived Benefits of Learning Activities

The first major theme, perceived benefits of learning activities, outlines the specific reasons students found the three activities (reflection, Quizizz, and one-minute silence activity) helpful. This theme establishes that the strategies are valued for their ability to enhance long-term recall and improve comprehension. The most frequently cited benefit related to the reflection activity is coded as deepening understanding and review (R-DEEP). This subtheme accounted for (n = 20) responses. Students consistently noted that reflection provided a necessary structure for re-engaging with the material, forcing them beyond surface-level recall to achieve better comprehension.

For instance, S12 explained, *"I find that reflection is more useful because it allows us to recall lessons and understand them better."* Similarly, S60 emphasized the thoroughness required, stating, *"Reflection is extremely useful because it allows us to understand the content of the subject of reflection more thoroughly."*

The second most frequent sub-theme, immediate recall and application (Q-RECALL; n = 13), was strongly associated with Quizizz. Students valued this tool for quick memorization and review, often noting its effectiveness just before exams.

As S15 noted, *"I would go with Quizizz because it can memorize the lesson and the important part for me very well."*

Benefits linked to the one-minute silence activity clustered around preparation and mind-awakening (QM-FOCUS; n = 12). These responses highlighted the value of a brief period of silence for transitioning into learning, improving mental clarity, and setting a focused intention for the class.

S61 summarized this function: *"Silence makes us gather our thoughts and prepare for study and gives us the spirit to grasp the lessons."*

Other important benefits include using activities to gauge personal knowledge and areas for improvement. Identifying gaps (R-AWARE; n = 8), driven by reflection, allowed students to realize their weaknesses: *"Reflection activities because they make me more aware of my shortcomings"* (S25). Conversely, measuring performance (Q-AWARE; n = 8), driven by Quizizz, allowed them to test their understanding against immediate results (S47). Finally, a notable proportion of students perceived the strategies as a collective success, citing comprehensive knowledge gain (ALL-COMB; n = 6) due to the synergistic effect of the different activities.

3.2.2. Impact of Learning Strategies on Student Engagement and Cognition

The second major theme explores the direct effects of the learning strategies on students' internal states and abilities, specifically categorized into Motivation, Focus, and Cognition (Learning). The findings reveal that the activities were most effective in boosting students' intrinsic drive and concentration.

3.2.2.1. Impact on Motivation

The strategies demonstrated a powerful influence on student engagement, with eagerness and work ethic (MOT-DRIVE) being the single most frequent code across the entire dataset (n = 22). This suggests the strategies successfully created a sense of internal drive and responsibility toward learning. Students frequently reported feeling encouraged to work harder, both inside and outside the classroom.

For example, S41 highlighted this drive: *"These strategies have influenced my study... making me more diligent and focused on the lessons."* Beyond the work ethic, the strategies fostered a positive learning environment (MOT-FUN; n = 8), with students valuing the enjoyable and unique nature of the activities, particularly Quizizz. S24 noted, *"These strategies have made my learning fun and brought a new sense of learning."*

3.2.2.2. Impact on Focus

The activities proved highly effective in managing the classroom atmosphere and improving student attention. The sub-themes enhanced concentration (FOC-CONC; n = 17) and stress reduction and peace

(FOC-CALM; $n = 12$) were dominant, often linked to the one-minute silent activity. Students explained that the quiet period served as a valuable mental preparation tool.

S27 noted that the activity *“made me feel focused and listen to the teacher’s explanation in class,”* which subsequently led to deeper understanding. Responses coded as FOC-CALM indicated the strategies helped students manage external pressures, with S58 observing that meditation *“helps to make you feel calm and not anxious.”*

3.2.2.3. Impact on Cognition

The strategies also provided substantial cognitive benefits. The highest-frequency cognitive impact was clarity and depth of understanding (COG-DEEP; $n = 17$), demonstrating that the activities helped move students beyond rote memorization. Students reported an improved ability to process information clearly and structure the content, as seen in the comment from S29: *“Makes me study hard, think deeply, and be highly determined.”* Closely related were memory and review (COG-RECALL; $n = 10$), with reflection and Quizizz serving as reliable tools for reinforcing material over time. Furthermore, the strategies aided in knowledge assessment, enabling knowledge assessment and self-correction (COG-AWARE; $n = 6$), allowing students to gauge their understanding and target areas for further study (S56).

3.2.3. Student Feedback on Instructional Methods and Environment

The third major theme summarizes student feedback, distinguishing between overall satisfaction and specific suggestions for improvement regarding the instructional environment and activity formats.

3.2.3.1. Overall Satisfaction

The findings indicate a high degree of satisfaction with the strategies employed. The most frequent code in this dataset was no suggestions/full agreement (AFFIRM-NONE; $n = 36$), demonstrating that the majority of students found the current structure beneficial and appropriate. These responses frequently affirmed the quality of the activities and the continuation of the approach.

For example, S37 stated: *“I hope these activities will continue forever because they are very good...”*

3.2.3.2. Areas for Improvement

While overall satisfaction was high, seven specific areas for improvement were identified. The suggestions generally clustered around improving the classroom environment or modifying the activity delivery method.

3.2.3.3. Environmental Concerns

The most frequent suggestions for improvement are related to the learning environment. The sub-theme student behavior & noise (ENV-BEHAVE; $n = 5$) highlighted how disruptive peer behavior negatively impacted focus.

S27 specifically requested that the instructor: *“Please encourage students in the class to refrain from disruptive activities in the classroom that interfere with listening to the teacher’s explanation.”* Concerns regarding instructional pacing & clarity (ENV-PACE; $n = 4$) also emerged, with students suggesting minor adjustments to teaching delivery, such as S18’s request: *“...if the teacher slows down the pace of the explanation, it will be easier to understand.”*

3.2.3.4. Activity Modification

Specific suggestions for modifying the strategies were also noted. For Quizizz, the sub-theme Quizizz format/anxiety (ACT-QUIZ; $n = 4$) captured technological issues and the emotional impact of the

game format. S15 expressed this anxiety directly: *"The only thing I wanted to tell the teacher is during quizzes I was literally nervous and kind of scared because the sound of the game and timer of the game truly gets me into anxiety."* There were also suggestions to address logistical limitations, such as increasing the quiet activity duration (ACT-QUIET; $n = 2$) to *two or three minutes* (S31), and requests for adding interaction & variety (ENV-INTER; $n = 4$), like *group activities or question-and-answer sessions* (S28).

4. DISCUSSION AND CONCLUSION

The purpose of this study was to examine students' perceptions of three instructional strategies: Weekly individual reflection, gamification using Quizizz, and a one-minute silent mindfulness activity, and to understand how these strategies influenced student engagement, focus, and learning. The study employs a mixed-methods approach by integrating quantitative survey results and qualitative open-ended responses in order to develop a comprehensive interpretation of these learning experiences. Overall, the findings demonstrate strong student support for all three strategies and reveal consistent patterns between quantitative and qualitative data.

The results from quantitative data revealed that students expressed generally positive perceptions of the reflection tasks. The highest-rated items related to identifying weekly learning and becoming more aware of personal strengths and weaknesses. Qualitative data further found that these perceptions were reinforced by frequent references to deepened understanding and structured review (R-DEEP), as well as the role of reflection in identifying gaps in knowledge (R-AWARE). These findings indicate that reflective writing served as a metacognitive tool that enhanced comprehension and self-assessment. Both data sources confirm reflection as a metacognitive tool that supports comprehension and self-monitoring. Students' positive perceptions of weekly reflections in this study—especially regarding deeper understanding, awareness of strengths and weaknesses, and the ability to consolidate learning—mirror long-standing research on reflective practice. Dewey (1933) conceptualizes reflection as a purposeful reconstruction of experience, which resonates with students' descriptions of using reflection to review content and make sense of weekly lessons. Similarly, Boyd and Fales' (1983) emphasis on reflection as an internal examination that leads to changed perspectives aligns with students' reports of gaining new insights and recognizing learning gaps. The findings are also consistent with the work of Boud et al. (1985), who argued that reflection is needed before, during, and after learning to anticipate, process, and consolidate experiences. Students' references to reviewing and revisiting content are consistent with this cyclical role of reflection. The metacognitive benefits examined in the qualitative responses further confirmed Schön's (1986) work, which stated that reflective capacity differentiates expert learners from novices. In our current findings, students noted improved recall and clarity, consistent with more recent empirical studies. For instance, Gravett (2018) found that weekly online reflections help students review material, extend discussions, and even improve course grades. The finding that reflections helped students identify key points parallels Khalafi et al.'s (2024) argument that repetitive reflective review supports long-term retention. Additionally, the increased confidence and ownership of learning described by students in our study reflected Frank's (2023) work, showing that informal weekly reflections enhance Habits of Mind such as metacognition and flexible thinking. Last but not least, we found that weekly reflection strengthened understanding, awareness, and increased effort, closely related to Cavilla's (2017) findings—linking reflection to deeper thinking, motivation, and self-efficacy.

Furthermore, for gamification using Quizizz, the quantitative results showed strong support for Quizizz, with students highlighting enjoyment, motivation, immediate feedback, and increased focus. These results aligned closely with qualitative themes such as immediate recall and application (Q-RECALL), measuring performance (Q-AWARE), and enhanced engagement or enjoyment (Q-MOTIV). Based on quantitative and qualitative findings, these results suggest that gamification not only increased students' enthusiasm but also strengthened formative assessment and memory processes. The findings are consistent with the previous work of Pum (2025), who emphasized that Quizizz should be integrated into formative assessment to make learning more enjoyable and engaging. Gamification enhanced both affective engagement and cognitive processing. The positive impact of Quizizz reported by students—including increased motivation, engagement, focus, and enjoyment—aligns with the broader body of gamification research. Gamification has long been recognized for improving engagement and learning outcomes (Caponetto et al., 2014; Yildirim, 2017), and the current findings reinforce this trend. Students' enthusiasm

for the interactive and fun nature of Quizizz is consistent with evidence that game elements enhance learners' attitudes toward learning (Manzano-León et al., 2021; Zeybek & Saygi, 2023). Specifically focusing on Quizizz (now Wayground), the literature strongly supports the platform's ability to sustain attention and promote active learning through features such as instant feedback, leaderboards, memes, and timers. The enjoyment and motivation reported in this study are consistent with the findings by Anak Yunus and Hua (2021), who highlighted that Quizizz is a meaningful, low-pressure learning tool. Students' reports of improved recall and focus also align with Degirmenci's (2021) conclusions that Quizizz supports repeated practice in an enjoyable way, particularly useful in language learning contexts. The positive user experience reported in our study is also consistent with previous studies showing that students become more attentive and active when Quizizz is used, especially toward the end of lessons when fatigue increases (Ju & Adam, 2018; Irwansyah & Izzati, 2021). Although some comparative studies note that Quizizz may produce slightly lower academic gains than non-gamified tools (Göksün & Gürsoy, 2019), the strong motivational and affective benefits found in this study reflect student preferences widely documented in the literature. Furthermore, students' perceptions of Quizizz as a helpful tool for monitoring progress align with recent research showing that weekly quiz performance on such platforms predicts exam outcomes and supports early intervention (Pum, 2025). The relevance of instant feedback—highlighted repeatedly in students' qualitative responses—is similarly supported by evidence that the platform's feedback system aids mastery and timely instructional adjustments. The growing integration of AI-generated quizzes, which helps maintain engagement while reducing teacher workload, further supports the platform's expanding pedagogical value (Durgunoz & Durgunoz, 2025).

In our study, what surprises us is that, among the three strategies, the one-minute silent activity received the highest overall rating. Students reported that it helped them calm their minds, focus, and prepare for learning. These perspectives were strongly confirmed in qualitative responses, particularly through themes connected to enhanced concentration (FOC-CONC) and stress reduction and peace (FOC-CALM). This indicates that even a brief mindfulness activity can create a conducive learning atmosphere by reducing cognitive load and emotional tension. Mindfulness served as a cognitive and emotional reset that prepared students for learning. Students' strong agreement that the one-minute silent activity enhanced focus, calmness, and readiness for learning aligns closely with existing literature on intentional silence and mindfulness. The shift in attention and emotional regulation described by students reflects Nayagam's (2025) finding that even brief structured silence, such as a one-minute prayer or pause, can significantly improve concentration and interpersonal dynamics. The results also reinforce broader conceptualizations of silence as an active and transformative learning process. For instance, Creely and Waterhouse (2024) argued that contemplative silence supports deep learning and meaning-making, which parallels students' descriptions of clarity and increased focus. Neurophysiologically, students' reports of calmness align with Dulčić's (2021) evidence that silence enhances neurogenesis and strengthens self-regulative attention. The role of silence in supporting inner awareness also resonates with long-standing pedagogical practices such as Montessori's Silence Game and Zen-based activities (Haskins, 2011). Students' descriptions of feeling calmer and more prepared reflect this tradition of nurturing internal stillness as part of the learning process. Furthermore, as students in this study reported reduced stress and improved focus, the findings are consistent with recent evidence that contemplative routines strengthen key competencies, including creativity and collaboration, in both early and higher education settings (Kos, 2025; Nyana et al., 2024). Collectively, our current results reinforce the growing consensus that brief, structured silent practices are powerful tools that enhance cognitive readiness, emotional regulation, and sustained attention in the classroom, while distractions are everywhere.

Finally, the combined three-strategy implementation was supported by the students ($M = 4.05$). They viewed these approaches as beneficial for improving learning experience, engagement, and motivation. The results from qualitative comments describing comprehensive knowledge gain (ALL-COMB) suggested that the strategies mutually reinforced one another, creating a more holistic learning process. The alignment of both datasets (quantitative and qualitative) strengthens the validity of the findings and demonstrates that the strategies had multidimensional impacts—cognitive, emotional, and motivational. This convergence aligns with the broader argument that combining complementary pedagogical strategies targeting different dimensions of the learning experience produces synergistic benefits exceeding what any single strategy achieves alone (Ash & Clayton, 2009; Manzano-León et al., 2021; Nyana et al., 2024). The holistic nature of this three-strategy model reflects a student-centered pedagogical philosophy that has gained considerable traction in higher education research (Kos, 2025; Zeybek & Saygi, 2023). The results of this study strongly

align with previous research on reflection, gamification through Quizizz (now Wayground), and classroom mindfulness practices.

5. LIMITATIONS AND RECOMMENDATIONS

Like other studies, there are several limitations of our research. First, the study was conducted with a specific group of students in a single educational setting. This may limit the generalizability to other contexts, disciplines, or educational levels; therefore, to strengthen external validity, replication studies in varied cultural and institutional contexts are necessary. Second, our quantitative measures relied on student self-reports, which may be influenced by social desirability or perceived expectations. Similarly, qualitative responses could be biased toward positive perceptions of the activities, especially when reflecting on instructor-led interventions. Moreover, our study examined students' perceptions over a limited time frame (15 weeks). Longitudinal effects of reflection, gamification, and mindfulness on academic performance, engagement, and motivation remain uncertain. We also acknowledge that gamified platforms like Quizizz require internet access and compatible devices. Some students may experience anxiety or technical difficulties, potentially affecting engagement and outcomes (Rabah et al., 2018; ACT-QUIZ feedback). Finally, the effectiveness of each strategy depends on how it is implemented. Variations in instructional delivery, quiz design, or silent activity facilitation could influence results, highlighting the importance of consistent and well-structured implementation.

Based on our findings and limitations, some recommendations for relevant stakeholders are proposed. Educators should integrate structured reflection exercises to foster metacognition and self-awareness practices that are well-supported in the literature as enhancing comprehension, self-regulation, and academic performance (Cavilla, 2017; Gravett, 2018; Khalafi et al., 2024), while including peer review or discussion components to expand learning perspectives. They should also use gamified tools like Quizizz strategically to enhance engagement, provide immediate feedback, and support formative assessment, while monitoring anxiety or over-competition (Manzano-León et al., 2021; Nyström, 2021; Pum, 2025). In addition, to enhance focus, emotional regulation, and readiness to learn, teachers/educators should incorporate brief mindfulness or silent practices in their classroom, with extended duration based on student feedback (maybe can do it for 2 minutes); intentional silence has been shown to improve concentration, reduce anxiety, and support neurogenesis (Dulcić, 2021; Nayagam, 2025; Nyana et al., 2024), while contemplative routines foster 21st-century competencies such as creativity and critical thinking (Kos, 2025). The most important thing is that we commend educators/teachers to design a combination of cognitive, motivational, and attentional strategies to maximize student engagement and learning outcomes. For researchers, conducting longitudinal studies is recommended in order to assess the long-term effects of reflection, gamification, and mindfulness on academic achievement, retention, and motivation. Future research should also explore these interventions across diverse disciplines, age groups, and cultural contexts to enhance generalizability. Researchers should also investigate potential negative effects of gamification, such as distraction, extrinsic motivation dependence, or technology-induced anxiety, and identify mitigation strategies (Kwon & Özpolat, 2021; Rabah et al., 2018). For policymakers and institutions, we recommend that they provide professional development to teachers on designing and implementing reflective, gamified, and mindfulness-based activities, as these strategies have demonstrated positive outcomes across diverse educational contexts (Caponetto et al., 2014; Creely & Waterhouse, 2024; Zeybek & Saygi, 2023). Specifically, both policymakers and institutions should support the integration of digital platforms in classrooms, ensuring equitable access to devices and stable internet connections. The significant contribution is that it promotes a holistic approach to teaching that combines cognitive, motivational, and emotional engagement strategies in curriculum guidelines.

6. SUGGESTIONS FOR PRACTICAL IMPLICATIONS

The findings of this study have several practically important implications. Firstly, educators should incorporate structured reflection activities with peer feedback to encourage students to engage with content, monitor learning progress, and identify gaps in their understanding. The incorporation can also expand learning perspectives and stimulate collaborative knowledge construction among students. The reflection activity can be used in both online and physical classes. Additionally, teachers should integrate gamified

quizzes into lesson plans strategically, ensuring alignment with learning objectives while monitoring potential negative effects (e.g., distraction or anxiety). Last but not least, educational practitioners can adopt one-minute silent or similar brief mindfulness routines to create a calm, attentive classroom atmosphere, reduce cognitive overload, and enhance overall learning efficiency. Finally, curriculum designers and instructional planners should integrate reflection, gamification, and mindfulness, as this combination of cognitive (reflection), affective/motivational (Quizizz), and attentional (mindfulness) strategies can generate complementary benefits, improving both student engagement and cognitive performance, emphasizing the value of diverse, evidence-based teaching strategies.

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Research Ethics. The survey questionnaire was administered anonymously, and no identifying information was collected. Participants were fully informed about the purpose of the study and the intended use of the data for research and teaching improvement. On the cover page of the survey questionnaire, we clearly stated that by completing the questionnaire, students provided implied consent to participate. All data were handled confidentially, and results were reported in aggregate form to protect individual identities. All the participants were informed that they could withdraw from their participation at any time without providing any reasons and with no consequences.

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