

Game Modes in Kahoot and Student Engagement in Secondary Mathematics Education: Theoretical Insights

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This conceptual paper explores how different Kahoot game modes influence student engagement in secondary mathematics classrooms using Gameful Learning Theory (GLT). Although Kahoot is widely used to make learning interactive, most studies treat it as a single tool without examining how each game mode functions differently. This paper analyzes 14 Kahoot modes such as Classic, Team, Submarine Squad, and Chill Art, and explains how their design affects motivation and participation. GLT helps mathematics teachers understand how features like points, speed, collaboration, and visual feedback shape students' interest and effort during problem solving. For example, competitive modes may boost focus and confidence but also increase pressure, while team-based formats promote collaboration and peer support. Slower-paced or creative modes allow students to reflect and build problem-solving skills in a more relaxed environment. By linking each mode to student motivation, this paper offers practical guidance on selecting game formats based on lesson goals and student needs. It also highlights areas for future research on how specific game designs influence learning in real classroom settings. The study shows that Kahoot is not a one-size-fits-all tool. It offers multiple formats that can support motivation in diverse and intentional ways during mathematics instruction.

Keywords: educational technology, gamification, gameful learning theory, student engagement

Introduction

Gamification has become a common approach in mathematics education, helping to make learning more engaging for students (Boom-Cárcamo et al., 2024; Mercat, 2022; Triantafyllou et al., 2025). It combines educational content with game-like elements to improve how students experience learning (Zaric et al., 2021; Triantafyllou et al., 2025). Tools such as Kahoot, Quizizz, and Blooket are now widely used in classrooms to turn routine practice into enjoyable activities through features such as points, timers, leaderboards, and rewards (Curto Prieto et al., 2019; Göksün & Gürsoy, 2019; Özdemir, 2025). These tools are often praised for increasing student motivation and participation, especially in mathematics, where many students face learning challenges (Martín-Sómer et al., 2021; Boom-Cárcamo et al., 2024; Suárez Caballero, 2023; Jack et al., 2025). Supporting this view,

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Muchuweni et al. (2025) noted that "...game-like features, such as avatars, leaderboards, and instant feedback ... create a dynamic environment that helps students understand mathematical concepts more deeply" (p. 119).

Recent studies have also reviewed how gamification can vary in depth, such as shallow, deep, or total gamification, and how this affects students' motivation and learning differently (Sánchez-Arévalo et al., 2025; Triantafyllou et al., 2025). Kahoot, in particular, is frequently used in secondary schools to support different learning goals, including quick reviews and collaborative problem-solving (Saraçoğlu & Kocabatmaz, 2019; Özdemir, 2025). However, most studies treat Kahoot as a single tool and overlook how its various game modes may influence student engagement differently. Each mode, such as Classic, Team, Submarine Squad, or Chill Art, offers a different combination of speed, teamwork, and creativity, which may shape how students participate in mathematics activities. This paper examines how the design of Kahoot's game modes can support motivation and engagement in mathematics lessons. It applies Gameful Learning Theory (GLT) (Landers, 2014) to explain how specific game features connect with student learning behaviors. While previous research has discussed the overall benefits of gamification, few studies have explored how individual game modes align with what teachers aim for students to learn. This paper aims to fill that gap by offering both theoretical insights and practical suggestions for mathematics teachers (Chiu et al., 2025). It considers secondary school students, particularly those in Grades 9–12, and focuses on mathematics topics such as algebra, functions, geometry, and introductory trigonometry. In this context, Kahoot game modes are mainly used for practice, review, and concept reinforcement, including solving equations and interpreting graphs. Kahoot game modes are not intended to replace rigorous mathematics instruction and problem-solving, but to support them through structured practice, review, and concept reinforcement activities.

Problem Statement

Although Kahoot is often used to enhance classroom engagement, most research treats it as a single, uniform tool. This overlooks the unique instructional value of its individual game modes (Dichev & Dicheva, 2017; Wang & Tahir, 2020; Curto Prieto et al., 2019; Göksün & Gürsoy, 2019). Different formats such as Classic Mode, Team Mode, or Submarine Squad have distinct effects on motivation, cognitive effort, and collaboration (Martín-Sómer et al., 2021; Boom-Cárcamo et al., 2024; Slamet & Meng, 2025). These differences matter in mathematics education because each mode may support specific goals like building procedural fluency, developing conceptual understanding, or promoting peer discussion (Licorish et al., 2018; Mercat, 2022).

Several recent reviews (Dichev & Dicheva, 2017; Wang & Tahir, 2020; Sailer & Homner, 2020) have called for more focused research on how gamification design connects with learning outcomes in specific subjects like mathematics (Zaric et al., 2021; Wirani et al., 2022). Yet, few studies have looked at how Kahoot's individual game modes align with theory-based models that explain how game features influence learning behavior. This gap in theory-informed, mode-specific research

makes it harder for teachers to select game formats that match their instructional goals (Amjad et al., 2025). As a result, opportunities to boost motivation, deepen understanding, or support collaboration may be missed, especially in lessons that involve solving equations, analyzing graphs, or discussing mathematical strategies. To address this issue, the current study uses GLT (Landers, 2014) to examine how Kahoot's game modes influence student motivation, effort, and interaction in secondary mathematics classrooms. The goal is to provide both theoretical insight and practical ideas to help teachers use Kahoot more intentionally during lesson planning. Within this context, the study is guided by the following research questions:

- How do Kahoot game modes influence student motivation and engagement in mathematics classrooms, according to Gameful Learning Theory?
- How can Gameful Learning Theory guide teachers in choosing effective Kahoot modes for different mathematics lessons?

Literature Review

This section reviews studies that examine how Kahoot and similar gamified tools influence student motivation and engagement in secondary mathematics classrooms. It also considers research that explains how game design features such as competition, collaboration, pacing, and feedback affect student participation during mathematics learning. In addition, the review draws on studies that use GLT to explain how these design features can guide teachers in selecting appropriate Kahoot game modes for different mathematics lesson goals.

How Kahoot Game Modes Influence Student Motivation and Engagement

Gamification is now common in classrooms and is widely used to make learning more interesting, especially in subjects like mathematics (Boom-Cárcamo et al., 2024; Mercat, 2022). It is broadly defined as the use of game design elements in non-game contexts to increase engagement and motivation (Deterding et al., 2011). Tools like Kahoot, Quizizz, and Blooket use points, rewards, and visual effects to turn regular lessons into game-like experiences (Curto Prieto et al., 2019; Göksün & Gürsoy, 2019). These elements, such as leaderboards, badges, and time challenges, are key parts of what Seaborn and Fels (2015) describe as gamification in both theory and action. Studies show that these tools help students focus, participate more actively, and enjoy learning (Martín-Sómer et al., 2021; Boom-Cárcamo et al., 2024; Plump & LaRosa, 2017). Research by Abusalem et al. (2024) and Bardorfer (2024) further shows that student engagement is strengthened when learning activities are intentionally designed to promote active participation, a consideration that is especially important in gamified formats where competitive and collaborative structures shape how confidently students engage in whole-class mathematics activities. Kahoot has become popular in secondary mathematics classrooms because of how it motivates students to review content and answer questions in a fun, competitive way (Saraçoğlu & Kocabatmaz, 2019).

Many studies report that students feel more excited and involved when Kahoot is used during mathematics lessons (Wirani et al., 2022; McCulloch et al., 2018). However, most of this research treats Kahoot as a single tool, without exploring how each game mode may affect motivation differently. Each mode has its own design and pacing (Zaric et al., 2021; Özdemir, 2025). For example, some are fast and competitive, while others are slower and more creative. These differences may influence how students feel about participating, especially depending on the topic or their confidence with the content.

Researchers such as Göksün and Gürsoy (2019) have pointed out that game design makes a difference. For example, Göksün and Gürsoy (2019) compared Kahoot and Quizizz and found that even small changes in the game format can lead to different levels of student engagement. This is consistent with Sailer and Homner's (2020) meta-analysis, which found that game elements are most effective when they match learning goals and student needs. Looyestyn et al. (2017) also found that gamification can increase engagement, especially when learners interact regularly with game features embedded in learning tasks. Majuri et al. (2018) and Işık and Kaban (2025) suggest that the design of game elements, such as feedback and pacing, can strongly influence the learning experience. This highlights the importance of attending to the design of specific game modes and their influence on student motivation (Luque-Sánchez & Montejo-Gámez, 2026). This study uses GLT (Landers, 2014) to explore how features like rewards, goals, feedback, and student choice can influence motivation through different Kahoot game modes.

How Gameful Learning Theory Helps Teachers Choose Effective Kahoot Modes

Gameful Learning Theory (GLT) (Landers, 2014) explains how specific design features such as points, feedback, and rewards can support student motivation when used thoughtfully. The key is alignment: game elements should match the learning goals and the way students process information (Zaric et al., 2021 ; Triantafyllou et al., 2025). When games are well designed, they can help students stay focused, feel competent, and persist through challenges (Boom-Cárcamo et al., 2024; Özdemir, 2025). Poorly designed games, on the other hand, may cause stress or confusion and hinder learning (Martín-Sómer et al., 2021). The goal is not simply to make learning fun. It is to use game modes in ways that support what students are expected to learn. For example, if a game moves too quickly or feels overwhelming, some students may lose focus or feel discouraged. But when features like pacing, collaboration, and creativity are matched to student needs, motivation and engagement improve (Zaric et al., 2021).

Although many studies describe Kahoot as enjoyable and motivating, few explain why from a theoretical perspective (Wirani et al., 2022). Even fewer examine how individual Kahoot game modes relate to learning theories like GLT. This matters because different modes support different learning needs. For instance, Classic Mode may be suitable for quick recall, Team Mode for collaboration, and Chill Art for students who benefit from a slower, more creative pace. Students' responses to gamified tools often depend on their learning preferences, reinforcing the need for thoughtful mode selection (Zaric et al., 2021).

GLT also connects with Self-Determination Theory (Ryan & Deci, 2000), which highlights the importance of autonomy, competence, and relatedness in motivation. When students feel they have choices, can succeed, and are supported, they are more likely to stay engaged. This aligns with broader research on school engagement, which includes behavioral, emotional, and cognitive aspects (Fredricks et al., 2004). Gamification should go beyond surface features like points and badges. It should involve intentional design choices that align with learning goals and support diverse learners (Deterding et al., 2011; Sailer & Homner, 2020). This paper uses GLT to guide teachers in selecting the most appropriate Kahoot modes for different types of mathematics lessons. It highlights a gap in the literature, where the connection between specific Kahoot game modes and theory-based instructional use remains underexplored.

Methodology

This study uses a conceptual qualitative approach grounded in GLT to examine how different Kahoot game modes may influence student motivation and engagement in secondary mathematics classrooms. The paper conducts a theory-driven analysis of 14 Kahoot game modes by examining their design features, such as pacing, feedback, competition, collaboration, and learner choice, and linking these features to motivational mechanisms described in GLT (Landers, 2014; Zanic et al., 2021). The 14 game modes were selected based on their availability within the Kahoot platform at the time of the study, representing the full set of modes accessible for classroom use during that period. This approach ensured that the analysis was not based on a sample, but rather on a comprehensive consideration of the platform's available game formats. The selection also considered their relevance to secondary mathematics instruction and included modes that reflect a range of interaction types, including individual, team-based, narrative, and creative formats. This ensured that the analysis captured variation in game design features that may influence student engagement in different ways.

The game modes were grouped into instructional categories based on shared design characteristics, allowing for systematic comparison and instructional interpretation. The categorisation of game modes was conducted through a comparative analysis of shared design characteristics. Each mode was examined in terms of pacing, feedback structure, level of competition, degree of collaboration, and opportunities for learner control. Based on these features, the modes were grouped into four instructional categories: competitive, collaborative, narrative, and creative. This classification was guided by GLT, which emphasizes how specific design elements activate different motivational pathways (Landers, 2014). This approach is appropriate for developing theoretical insight and practical guidance for teachers, while remaining consistent with established conceptual research in gamification and mathematics education (Sailer & Homner, 2020; Triantafyllou et al., 2025).

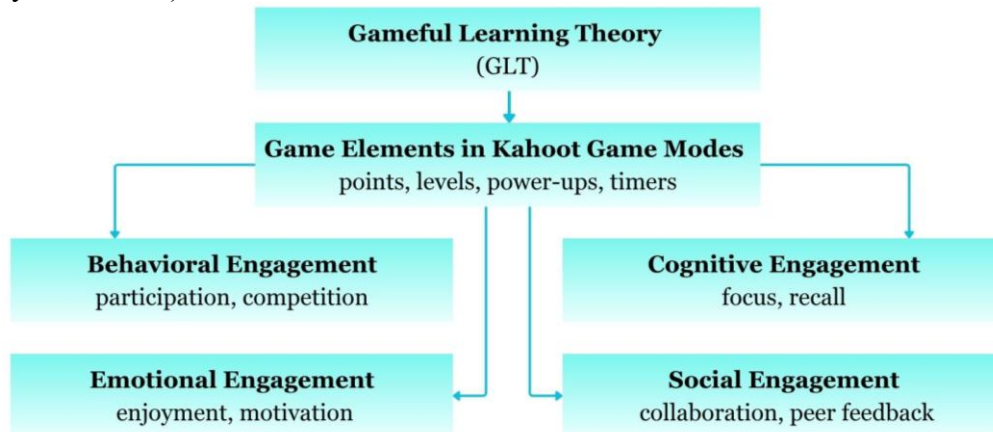
Theoretical Framework

This paper uses Gameful Learning Theory (GLT) to explore how different Kahoot game modes affect student engagement in secondary mathematics classrooms. Developed by Landers (2014), GLT explains how features like points, timers, feedback, rewards, and competition can influence student motivation. Instead of focusing on gamification in general, the theory looks at how specific design choices impact students' effort, interest, and attention (Zaric et al., 2021; Boom-Cárcamo et al., 2024; Sailer & Homner, 2020).

GLT is well suited to this study because it focuses on motivation, which is the main concern of this paper. Each Kahoot mode works in a different way (Saraçoğlu & Kocabatmaz, 2019). Some focus on speed and excitement, while others promote teamwork or reflection. GLT helps explain why certain students are drawn to particular modes and how those design features align with lesson goals. When a game's structure supports what students are expected to learn, they are more likely to stay engaged and try their best (Curto Prieto et al., 2019; Wirani et al., 2022; Looyestyn et al., 2017). On the other hand, if a game feels too fast or confusing, students may become frustrated or disengaged (Martín-Sómer et al., 2021).

This theory aligns with the paper's focus on motivation in mathematics classrooms. While other theories explore memory or group processes, this paper is not measuring those outcomes. Instead, it focuses on how game design in Kahoot either support or limit student motivation. For example, Classic Mode is useful for quick reviews, while Team Mode helps students feel supported through collaboration. Chill Art and Cosmic Conquest are better suited for students who benefit from a slower pace. GLT encourages teachers to consider how different game modes meet different learning needs based on how each one is designed. It also supports findings from gamification research. For example, Deterding et al. (2011) and Seaborn and Fels (2015) emphasized that game elements should be purposefully designed to support learning. More recently, Sánchez-Arévalo et al. (2025) highlighted the importance of aligning these elements with instructional goals in mathematics classrooms. Figure 1 shows how GLT can help explain the impact of different Kahoot game modes on student motivation and engagement in mathematics classrooms.

Figure 1. Gameful Learning Theory and Student Engagement in Kahoot (developed by the authors)



Results: Conceptual Analysis of Kahoot Game Modes in Secondary Mathematics Instruction

This section presents a conceptual analysis of Kahoot game modes using GLT to examine how different design features support student motivation and engagement in secondary mathematics classrooms. GLT explains how elements such as points, feedback, rewards, and player choice influence students' participation and focus during learning tasks (Landers, 2014; Zaric et al., 2021). In place of treating Kahoot as a single instructional tool, the analysis highlights how different game modes align with different learning goals. To structure the results, the 14 Kahoot game modes are grouped into four categories, competitive, collaborative, narrative, and creative, as shown in Figure 2.

Figure 2. Gameplay-based Categorization of Kahoot Modes in secondary Mathematics (developed by the authors)



Influence of Kahoot Game Modes on Student Motivation and Engagement

The analysis shows clear differences in how Kahoot game modes support student motivation and engagement in secondary mathematics, based on their design features.

Using GLT, the 14 Kahoot game modes were classified into four categories: competitive, collaborative, narrative, and creative, according to shared characteristics such as pacing, feedback, interaction, and learner control (Landers, 2014; Zaric et al., 2021). Competitive modes, including Classic Mode, Accuracy Mode, Robot Run, Tallest Tower, and Treasure Trove, emphasize speed, accuracy, and individual performance. These modes use timers, points, and rankings, which are associated with increased attention, rapid responses, and strong task focus. From a GLT perspective, instant feedback and visible progress function as extrinsic motivators that support effort and concentration during short mathematics activities (Landers, 2014). The analysis also indicates that time pressure and ranking features may affect students differently, particularly during complex or multi-step mathematical tasks, where some students may experience increased pressure (Martín-Sómer et al., 2021).

Collaborative and team-based modes, such as Team Mode, Submarine Squad, and Color Kingdoms, prioritize shared goals and group interaction. These modes distribute responsibility across team members and reduce individual performance pressure. Shared scoring and collective progress align with GLT mechanisms related to social engagement and relatedness (Zaric et al., 2021). The results show that these modes support sustained participation during mathematics tasks that involve explanation, comparison of strategies, and joint reasoning (Curto Prieto et al., 2019; Saraçoğlu & Kocabatmaz, 2019).

Narrative and exploration modes, including The Lost Pyramid and Cosmic Conquest, integrate storylines, missions, and visual progression. These modes support engagement through immersion and curiosity. Within GLT, narrative structure functions as a motivational pathway that maintains interest and encourages persistence (Landers, 2014). The analysis shows that these modes are well suited to exploratory tasks, introductory lessons, and problem-solving activities where reduced performance pressure supports engagement (Boom-Cárcamo et al., 2024).

Creative and reflective modes, such as Chill Art, Lecture Mode, and Confidence Mode, emphasize slower pacing, expression, and low-stakes interaction. These modes allow students to respond at their own pace and focus on explanation or reflection rather than comparison. From a GLT perspective, autonomy and reduced external pressure support intrinsic engagement (Zaric et al., 2021). The results indicate that these modes provide more inclusive participation opportunities, particularly for students who are less responsive to competitive formats. The results show that Kahoot game modes are not functionally equivalent. Differences in pacing, feedback, interaction, and learner control are associated with distinct motivational pathways, indicating that game mode selection plays a meaningful role in shaping student engagement during mathematics instruction.

Using Gameful Learning Theory to Guide Mode Selection in Mathematics Lessons

The results further show that GLT provides a clear framework for guiding teachers' selection of Kahoot game modes for different instructional purposes. GLT explains how specific game design features connect to motivational mechanisms, including goal orientation, feedback timing, learner autonomy, and social interaction

(Landers, 2014). Across the analyzed modes, alignment between instructional goals and game design features emerged as a consistent pattern. Competitive modes align with learning goals related to speed, recall, and procedural fluency because their design emphasizes rapid feedback and individual performance comparison. Collaborative modes align with goals related to communication, reasoning, and shared problem-solving through peer interaction and collective responsibility. Narrative modes align with goals focused on exploration and engagement with new content, while creative modes align with reflection, explanation, and confidence building through low-pressure participation.

The analysis also shows that GLT explains why the same gamified platform can produce different motivational outcomes depending on how it is configured. Rather than attributing engagement effects to Kahoot as a single tool, the results highlight the role of specific design elements within each game mode (Zaric et al., 2021). This indicates that gamified instruction operates as a design-dependent process not a uniform intervention. In addition, the results indicate that GLT-based mode selection reflects principles of purposeful digital technology integration in mathematics education. Emphasizing intentional alignment between pedagogical goals and digital design features supports systematic instructional decision-making rather than ad hoc use of gamified tools (Dockendorff & Gómez Zaccarelli, 2025). Table 1 summarizes how each category of Kahoot game modes aligns with key motivational constructs within GLT.

Table 1. Summary of How Kahoot Game Mode Categories Support Student Motivation Based on Gameful Learning Theory

Game Mode Category	Gameful Learning Theory
Competitive Modes	Emphasizes extrinsic motivation through points, leaderboards, time pressure, and individual progress.
Collaborative Modes	Drives motivation through shared goals, team-based challenges, and collective rewards.
Narrative Modes	Encourages intrinsic motivation via storylines, missions, and progressive challenges.
Creative Modes	Fosters engagement through creativity, personalization, and low-stakes interaction.

Discussion

This section discusses the conceptual findings in relation to existing research on gamification, Kahoot, and student engagement in mathematics education. Drawing on GLT, it explains how differences in Kahoot game mode design account for variations in student motivation and engagement. The section also considers how these findings support more intentional and theory-informed use of gamified tools in secondary mathematics classrooms.

Kahoot Game Modes and Student Motivation and Engagement in Mathematics

The findings suggest that Kahoot game modes influence student participation and learning experiences differently depending on their design. This aligns with earlier research by Deterding et al. (2011) and Sailer and Homner (2020), which shows that gamification outcomes are shaped not only by the presence of game elements, but also by how those elements are structured and experienced by students. Instead of functioning as a single instructional tool, Kahoot offers multiple formats that activate different motivational pathways.

Competitive modes appear to align with research showing that points, time limits, and leaderboards can increase attention and effort during short mathematics tasks, including algebra review activities, rapid equation-solving exercises, and quick graph interpretation tasks (Göksün & Gürsoy, 2019; Curto Prieto et al., 2019). These features are consistent with findings by Hamari et al. (2016), who reported that challenge and performance feedback can heighten engagement. At the same time, the results support concerns raised by Martín-Sómer et al. (2021) that fast pacing and performance pressure may negatively affect some students, particularly during cognitively demanding mathematics tasks involving graph interpretation and multistep problem-solving.

Collaborative modes reflect well-established research on cooperative learning in mathematics. Studies by Gillies (2016) and Johnson and Johnson (2009) emphasize that shared goals and positive interdependence are important in cooperative mathematics learning. The discussion-based structure of team modes in Kahoot aligns with these findings by encouraging explanation, reasoning, and peer support during activities involving geometry concepts, trigonometric relationships, and multistep problem-solving. This supports claims by Curto Prieto et al. (2019) and Saraçoğlu and Kocabatmaz (2019) that gamified tools are especially effective when they promote interaction rather than individual competition.

Narrative and creative modes highlight the role of intrinsic motivation in mathematics learning. Prior research suggests that playful and exploratory environments can reduce anxiety and support engagement, especially for students with lower confidence (Boom-Cárcomo et al., 2024; Mercat, 2022). These modes align with findings that students may respond positively to curiosity, visual exploration, and meaningful progression rather than constant performance comparison (Zaric et al., 2021). In mathematics classrooms, these modes may support exploratory learning activities involving functions, visual patterns, graph analysis, and conceptual interpretation of mathematical relationships. The discussion reinforces the view that Kahoot game modes are not equally effective for all students or all mathematical tasks, and that engagement depends on how design features interact with learner needs and instructional goals.

Using Gameful Learning Theory to Support Purposeful Mode Selection

The discussion also highlights the value of GLT as a guide for instructional decision-making. GLT helps explain why the same platform can produce different engagement outcomes depending on how it is used (Landers, 2014). By focusing on

design features such as feedback timing, learner control, pacing, and social interaction, GLT shifts attention away from the tool itself and toward how teachers structure learning experiences.

This interpretation aligns with broader gamification research showing that learning benefits occur when game elements are aligned with instructional goals (Sailer & Homner, 2020; Majuri et al., 2018). Rather than using Kahoot modes interchangeably, the findings suggest that teachers can select modes strategically. Competitive modes may support procedural fluency and recall, including rapid algebra practice, formula review, and trigonometric skill reinforcement, while collaborative modes align better with reasoning, explanation, and mathematical discussion. Narrative and creative modes appear more suitable for exploration, reflection, and confidence building during activities involving graphs, geometric representations, and conceptual interpretation of mathematical relationships. However, these game modes are most effective when integrated with teacher-guided explanation, mathematical reasoning, and structured problem-solving activities.

These insights also support recent calls for more purposeful digital technology integration in mathematics education. Dockendorff and Gómez Zaccarelli (2025) emphasized that effective technology use depends on pedagogical intent rather than tool availability. Similarly, Amjad et al. (2025) noted that teachers often struggle with gamification when guidance on design choices is unclear. By applying GLT, teachers gain a practical framework for making informed decisions about when and how to use specific Kahoot game modes. In this way, the discussion positions Kahoot not as a motivational shortcut, but as a flexible instructional resource. When game modes are selected intentionally and aligned with lesson goals, they can support diverse learners and promote meaningful engagement during structured mathematics instruction and problem-solving activities in secondary classrooms.

Limitations

This study is conceptual and does not include empirical data from classrooms. To address this, the authors grounded the analysis in well-established research and used GLT to provide a clear and systematic explanation of how Kahoot game modes may influence student engagement. The analysis focuses only on Kahoot, which may limit how far the findings can be applied to other gamified tools. However, the paper concentrates on design features such as competition, collaboration, pacing, and creativity, which are common across many gamified learning platforms. The grouping of Kahoot game modes is based on theoretical design features and may vary depending on how teachers use the modes in practice. To reduce this limitation, the authors linked each category directly to learning goals and classroom use in secondary mathematics. Despite these limitations, the study offers a structured theoretical framework that can guide future empirical research and support teachers in making informed decisions when using Kahoot in mathematics classrooms.

Conclusion

This paper explored how Kahoot's different game modes can support student engagement in secondary mathematics classrooms using GLT. By examining 14 game modes, the study showed that each one has unique strengths depending on how it is used in teaching. The key contribution of this study is that Kahoot should not be treated as a single instructional tool, but as a set of distinct game modes with different effects on student motivation and engagement. When mathematics teachers choose game modes thoughtfully, they can improve motivation, participation, and understanding during mathematics lessons. Kahoot game modes are most effective when they are aligned with rigorous mathematics instruction, conceptual understanding, and structured problem-solving activities. The findings show that Kahoot modes are purposeful teaching tools that should be selected based on student learning needs and lesson goals. When used well, these modes can help students build fluency, think more clearly, work together, and reflect on their ideas. More research is needed to find out how each game mode affects learning in real mathematics classrooms. Future studies could explore how different modes influence mathematics problem-solving, memory, or long-term motivation. It is also important to understand how teachers make decisions about which modes to use and how those choices relate to their students and teaching environments. In summary, GLT provides a clear framework for selecting and using Kahoot game modes to support engaging and effective mathematics instruction.

Implications for Practice and Research

This analysis highlights key points for both classroom practice and future research in gamified mathematics education. As tools like Kahoot continue to evolve and add new features, mathematics teachers and researchers need to think carefully about how each game mode can support learning in mathematics classrooms.

For mathematics teachers, the main message is to match game modes with students' needs and the goals of the lesson. This helps teachers select and use Kahoot game modes that align with specific mathematics learning goals. Instead of always using Classic Mode, teachers should consider how each format supports different kinds of mathematical learning. Competitive modes like Accuracy Mode are helpful for quick practice or review. Collaborative modes such as Team Mode and Submarine Squad work better for group tasks that involve discussion and shared problem-solving. Creative formats like Chill Art allow students to reflect, explain their thinking, and make connections, especially during tasks like interpreting graphs or modeling equations. These modes may also support activities involving geometry visualization, trigonometric reasoning, and interpretation of mathematical patterns across multiple representations. It is also important to think about how students feel while playing. Some students enjoy fast-paced challenges, while others prefer slower and more supportive modes. Kahoot offers a wide range of options that can help boost motivation, lower anxiety, and support different learning preferences. Teacher training programs and workshops should help mathematics teachers learn

how to choose and use these modes in ways that support both engagement and understanding, especially in topics like solving equations, analyzing data, or exploring mathematical patterns. Kahoot game modes should be used to reinforce and support rigorous mathematics instruction rather than replace conceptual teaching, mathematical reasoning, and problem-solving opportunities in the classroom.

For researchers, this study points to the need for more detailed investigations into how Kahoot's game modes affect student learning in mathematics. Future research could look at how specific game features influence motivation, reasoning, and problem-solving in mathematics tasks. It would also be valuable to study how teachers choose game modes in real classroom settings and how those choices relate to student needs, instructional goals, and access to technology. Kahoot game modes are more than just fun options. They are powerful teaching tools that shape how students engage with mathematics, how they solve problems, explain their thinking, and grow in confidence.

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