

Exploring The Effectiveness of Gamified Learning Approaches for Students with Autism Spectrum Disorder

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ABSTRACT

This study investigates the effectiveness of gamification in enhancing the learning experiences of students with autism spectrum disorder (ASD). Students with ASD often face challenges with traditional teaching methods, particularly in maintaining focus, engagement, behaviour, and participation in classroom activities. To address these challenges, this research explores how gamified learning approaches can create a more engaging and supportive environment tailored to their unique learning needs through the teachers' perspectives. Guided by Self-Determination Theory (SDT), which emphasizes autonomy, competence, and relatedness, and supported by Constructivist Learning Theory, which highlights active participation in knowledge construction, the study adopts a qualitative research design. Semi-structured interviews were conducted with special education teachers to gain insights into their perceptions and experiences in applying gamification in classroom settings. Thematic analysis of the data revealed two primary themes: motivation and engagement. Findings indicate that gamification enhances both intrinsic and extrinsic motivation among ASD students through the use of rewards, badges, instant feedback, and opportunities for autonomy in learning tasks. Additionally, gamified elements such as visual, audio cues, and personalized learning experiences significantly foster engagement, helping students maintain focus, minimize distractions, collaborate with peers, and develop communication skills. This study's findings demonstrate that gamification serves as more than a supplementary educational tool and represents a transformative pedagogical approach that supports the holistic development of students with ASD. By integrating gamified strategies into special education, teachers can effectively align instructional methods with the social, emotional, and cognitive needs of ASD learners, ultimately enhancing both academic performance and behavioural growth.

Keywords: autism spectrum disorder, gamification, special education, motivation, engagement, self-determination theory, constructivist learning theory

INTRODUCTION

Autism spectrum disorders (ASDs) are neurodevelopmental conditions characterized by poor communication, social interaction, repetitive and stereotyped patterns of behaviour, and uneven intellectual development, which is frequently accompanied by intellectual impairment (Sulkes, 2022). Autistic individuals' abilities and needs vary and might change over time. While some autistic individuals can live independently, others have severe challenges that need lifelong care and support (World Health Organization, 2023). Individuals with ASD may require specialized methods of education that are tailored to their specific learning requirements. Moreover, some autistic children exhibit symptoms as early as a few months of age. Besides, others appear to develop well for the first several months or years of their lives before developing symptoms (Pathak, 2021).

In inclusive classrooms, special and general education teachers collaborate to create learning environments that accommodate the diverse needs of all students, including those with ASD. While general education teachers focus on content delivery and classroom management, special education teachers provide individualized instruction and behavioural supports (Lewis et al., 2024). However, both groups continue to face challenges in identifying effective teaching approaches that can enhance engagement and motivation among students with ASD.

One promising approach is gamification, which integrates game-based elements such as points, rewards, and levels into the learning process to increase motivation and engagement. Research has demonstrated that gamification can create more inclusive and equitable learning environments by providing engaging and effective educational experiences for all students (Cruz, 2024). The use of game features in non-game contexts to increase user experience and engagement is referred to as gamification (Lam & Tse, 2022). Gamification is frequently used to overcome specific involvement difficulties. For example, regular and consistent practice is critical in the context of special education.

Besides, traditional lessons and tasks might not be interesting enough for the students, but gamification keeps their attention span for longer (Stuart, 2022). Gamification would encourage the students to interact with the information more, enhancing the efficiency and advantages of the educational content (Elcik, 2021). Gamification may be used as a group as well as an individual learning method. For example, games that can be involved are puzzle games, memory games, sorting shapes, and so on. In addition, colourful visual effects of the games and also catchy background music that come along with the games help in sustaining and motivating students to play and also compete with each other to achieve higher levels in their academics.

Despite growing interest, there remains a clear research gap regarding the effectiveness of gamification for students with ASD in educational settings (Wulan et al, 2024). Although there is a growing database of research on gamification in education, only a few research studies have particularly explored the effect it has on autistic students (Carneiro, 2024). Outcome measures are often non - standardized or confined to in - game assessments, with few studies evaluating whether gains transfer to daily life; emotional resilience and daily functioning are rarely addressed.

It is also noted that previous research participant samples tend toward high - functioning, school - aged males, with little inclusion of younger children, adolescents, or those with comorbid conditions (Carneiro, 2024; Fang et al., 2019). In addition, descriptions of intervention components vary widely, and details on technology features, session intensity, and multiplayer functionality are often missing. These limitations, consistently highlighted across systematic reviews and exploratory studies, restrict the current ability to assess the real-world effectiveness of gamified approaches for ASD children (Carneiro, 2024; Wongwan et al., 2025). This study seeks to investigate the effectiveness of gamification as a teaching approach for students with ASD and explore how teachers can integrate gamified strategies to enhance learning motivation, engagement, and behavioural outcomes within the classroom. The research questions guiding this study are as follows:

RQ 1: What are the ASD teachers' perceptions of gamification as a method for teaching?

RQ 2: How does gamification influence students with ASD engagement and motivation in the classroom?

Research Design

This study employed a qualitative research design, as it provided in-depth insights into teachers' experiences and perspectives on the use of gamified learning. This approach enabled the researcher to gain a comprehensive understanding of the strategies implemented in gamified teaching and the various ways in which special education teachers evaluated their impacts on the cognitive, behavioural, and social development of students with ASD (Gaitanid, 2023). The research was conducted within school settings and through online platforms to accommodate participants' availability and preferences. Semi-structured interviews were used as the primary data collection method, allowing for both guided and open-ended responses. This format provided flexibility for participants to share detailed insights and experiences related to the use of gamification in their classrooms. The interviews focus on teachers' observations of how gamified learning influences students' academic performance, engagement, and behavioural challenges.

Population and Sample

The target population for this study comprised special education teachers who work with students diagnosed with ASD across various schools in Malaysia. A purposive sampling technique was employed, as it is commonly used in qualitative research to select participants based on specific characteristics and relevant experiences related to the research topic. In this study, purposive sampling was applied to identify special education teachers who met the following criteria: (1) a minimum of two years of teaching experience, and (2) experience in implementing gamification as part of their teaching and learning strategies with ASD students through digital platforms. A total of six special education teachers from different districts in Malaysia participated in the study. These participants were selected based on their direct involvement in applying gamified learning approaches within special education settings. Their diverse backgrounds and teaching experiences provided rich insights into the use of gamification in supporting the learning and development of students with ASD.

Table 1. Demographic Information

Participant	Years of Teaching Experience	Working Field
Participant 1	3 Years	Shadow Aide Teacher
Participant 2	4 Years	Special Needs Teacher
Participant 3	5 Years	Occupational Therapist
Participant 4	3 Years	Special Needs Teacher
Participant 5	4 years	Special Needs Teacher
Participant 6	4.5 Years	Special Needs Teacher

Instrumentation

The interview questions were adopted from a previous research study by Fornelius (2024). The research instrument was divided into two main sections. The first section included two demographic questions, followed by two introductory questions aimed at exploring teachers' general understanding and experiences with gamification. The second section comprised nine in-depth questions that focused on teachers' perspectives regarding the use of gamification in classroom settings, particularly its impact on students with ASD. Each interview lasted approximately 30 to 45 minutes and was audio-recorded with participants' consent. To ensure confidentiality and encourage open discussion, interviews were conducted in a private setting within the school premises and, when necessary, through the Zoom online platform. The use of the online platform was particularly beneficial for participants who faced time constraints or were located in different states across Malaysia. This combination of in-person and virtual interviews allowed the researchers to collect diverse insights from teachers across multiple regions, providing a broader understanding of the implementation of gamification in special education contexts.

Data Analysis

Thematic analysis is a method used in qualitative research to structure and examine complex data collections. Data gathered through interviews will be examined using thematic analysis, a method that enables the detailed identification, description, and interpretation of trends found within a data set (Dawadi, 2020). The thematic analysis framework by Braun and Clarke in 2006 includes six steps, including data familiarisation, initiating the creation of codes, searching for topics, reviewing themes, defining and naming themes, and writing the report (Ahmed et al., 2025). The researcher will review interview transcripts to achieve a comprehensive understanding of the collected data. The NVivo software will be used to transcribe and analyse the data.

RESULTS

Theme One: Motivation

Code: Encouraged

It is evident that motivation is the main theme mentioned by all the teachers, while engagement is the second theme, mentioned by only five out of the six teachers. Furthermore, special education teachers who explored the theme of motivation found that gamified elements such as leader boards, point systems, badges, and levels greatly influenced both intrinsic and extrinsic motivation in students. Teachers discovered that established and structured rewards, together with success indicators, imparted tangible recognition, boosting students' sense of autonomy, competence, and relatedness, all of which are consistent with the key concepts of Self-Determination Theory. For example, during the interview, participant 1 mentioned that "in Quizizz and Kahoot and so on, there are badges and also, like rewards and like instant feedback. They show whether it's correct or wrong and all I see is that my students get very motivated to participate and they feel like they really enjoy it because it also helps them to, you know, like, compete and they want to do better and they really look forward to it." Participant 2 supported the statement that "when they collected the badges created a sense of achievement in themselves and encouraged themselves to be persistent." Moreover, participant 3 supported the idea that "through the game kind of ways they can engage more in the lessons and they will feel more motivated because the rewards can be given once they successfully answer the game so for them they feel more encouraged and they are willing to try more." Therefore, it can be said that students feel motivated through gamification. Furthermore, integrating gamification will spark ASD students' curiosity about their environment and help them broaden their understanding.

Code: Enjoy and Interesting

This approach makes lessons more engaging, interesting and enjoyable, allowing students to grasp what the teacher has covered more effectively. Participant 1 mentioned that "I think it really turns the lesson into something like super fun for all of them and they are ultimately positive when it comes to gamification." Participant 2 supported the idea that "I think they are freely enjoying the lesson and the assessment because mostly I do assessment based on gamification so that it won't be boring for the students." Additionally, participant 3 also supported the statement that "like using the games way, it will be more attractive to the kids, they will have more attention and they will feel that it's more interesting." Participant 4 mentioned that "I decided to use gamification in my teaching because it will make the lesson more fun and also engaging and the students will be happy and also excited to learn new things." Furthermore, participant 5 supported the statement as well by mentioning that "I decided to use games in my teaching because it will help my students always feel motivated and they will come to school happily, can enjoy playing games and keep them engaged for their entire lesson so that everyday facing the book would not make them feel bored or tired." Participant 6 also agreed that "so gamification opens up opportunities for increased engagement, better behaviour regulation and then social interaction that keep them interested and especially keep them actively participating." Therefore, it was proven that the gamification approach makes lessons more engaging, interesting, and enjoyable, allowing students to grasp what the teacher has covered more effectively.

Code: Excited

Gamification positively impacts students with ASD, as they frequently show increased motivation for learning and experience excitement when they earn rewards, badges, and feedback, and they are more eager to engage in classroom activities. For example, participant 1 mentioned that “most of the time they are very, very positive like I told you, they are very, very excited. They enjoy it, they interact and also, like, they really look forward to participate and even like sometimes if I don't mention that I'm going to give them games and so on, they themselves will come and ask. They will be like, teacher, are we playing a game today?” Participant 2 supported the statement that “the students’ show their excitement and then while they are preparing themselves to gamify activities are also fully focused on the games provided.” Besides, participant 3 mentioned that “they will be more excited and sometimes it feels like the kids for them the game versions they will have more sound instead of just purely looking at the black and white so for them they will easily feel excited.” Participant 4 agreed that “when they go from one level to another when they are playing the games, it will help them to always feel excited and also to feel motivated to play the games.” This indicates that students with ASD are encouraged and engage more actively in their education when gamification is integrated into their learning experience.

Code: Rewards

Additionally, gamified learning enabled students to set individual goals and experience a sense of accomplishment. Students with ASD experience increased confidence, enabling them to advance academically through gamification, and they feel happy after receiving rewards or badges upon reaching those goals. Participant 1 revealed that “when they see visuals and they engage in their own learning, they actually feel very, very motivated and also they feel very, very rewarded and also like when I use Kahoot, they get immediate feedback.” Participant 2 supported the point by saying that “special education students, when they receive a reward from the teacher or even from their friends as a gift, they appreciate that and they welcome that actually.” Participant 3 also supported that “can see if let’s say it’s like purely the book types for them because they need some time to really understand what is being taught but if let’s say through the game kind of the ways they can more engage into the lessons and they will feel more motivated because the rewards can be given once they successfully answered the game.” Participant 6 mentioned that “so my technique basically I use all those educational apps and they get the immediate feedback, immediate rewards and that makes them like they are more interested.” The findings demonstrated that through gamification, students with ASD feel motivated to learn and explore their surroundings.

Theme Two: Engagement

Code: Interactive

Meanwhile, from the engagement perspective, the findings indicate that gamification improved the integration of tasks while maintaining involvement throughout the learning period. Students with ASD, who often find it challenging to maintain attention, demonstrated extended focus when tasks were framed as games. For example, participant 2 said that “special education students are more interactive in visualisation learning and kinesthetics learning so when we include gamification in teaching, they develop their skills better compared to using traditional methods which is quite boring.” Participant 6 supported that “many students who usually struggle to focus are more attentive, more enthusiastic, and then the appealing visuals, the interactive games and their learning spans and attention spans, their focus, everything has been increased a lot especially on the part where they come forward to participate.” The appealing visuals attract the attention of the students with ASD and keep them interested.

Additionally, participant 5 mentioned that “some students might like sound, some might not, so teachers can prepare activities that include sound but the students that don’t like sound make them familiar with the sound so they can overcome sound sensitivity.” The statement is based on the constructivist learning theory that education should be tailored according to the student’s stage of development and cognitive abilities.

Code: Collaboration and Teamwork

Collaboration among team members was also observed, as gamification encouraged engagement among students who had previously been isolated. Participant 1 mentioned that “sometimes I let them sit as a group and answer those questions. So, when they do that, they share the knowledge and it also encourages them to work as a team. So, I also see that teamwork is improved when they use gamification.” Furthermore, participant 5 said that “students most of the time enjoy gamification and we can see group engagement with them.” It can be seen that students interact and are ready to collaborate with their peers to achieve the targeted goals.

Code: Communication skills

Nevertheless, gamification enhances individuals’ communication skills by extending their boundaries, enabling them to engage more effectively with their peers. For example, participant 3 stated that “we can see like the students will have more so-called two-way communications not mentioning that they are answering us but they have more interactions with the teachers.” Participant 5 supported that “they like to seek attention to play the games and that time I can see they will try to communicate even the one with autism that has less communication skill will try to communicate to engage themselves in the activity.” Participant 6 agreed that “so it’s like two-way communication where the kids interact with the teacher, the teacher interacts with the kids and it’s like the learning process is more fun and it’s more interactive for them.” Therefore, it is proven that gamification enhances individuals’ communication skills by extending their boundaries, enabling them to engage more effectively with their peers.

The interview results revealed that gamification significantly increased student engagement by combining visual appeal, organized tasks, and opportunities for accomplishment. These findings are consistent with Piaget’s Constructivist Learning Theory, which highlights the importance of active involvement and hands-on learning. Gamification turns traditional learning into an engaging experience, allowing students to enhance their understanding through practice, feedback, and modification. The theme of engagement highlights the way gamification enhances concentration, encourages social interaction, and fosters emotional involvement in educational activities. Table 2 provides a summary of the key themes that emerged from the thematic analysis.

Table 2: Thematic Analysis on the Effectiveness of Gamification for Students with ASD

NO	THEMES	CODES	FREQUENCY	PARTICIPANT
1	Motivation	1.1 Encouraged	6	Teacher 1
		1.2 Enjoy		Teacher 2
		1.3 Excited		Teacher 3
		1.4 Interesting		Teacher 4
		1.5 Rewards		Teacher 5
				Teacher 6
2	Engagement	2.1 Interactive	5	Teacher 1
		2.2 Collaboration		Teacher 2
		2.3 Teamwork		Teacher 3
		2.4 Communication Skills		Teacher 5
				Teacher 6

DISCUSSION

Teachers' Perceptions of Gamification as a Teaching Method

The findings reveal that teachers generally perceive gamification as a supportive and effective method for teaching students with Autism Spectrum Disorder (ASD). Teachers described gamification as an additional instructional tool that complements traditional teaching methods, helping to make lessons more engaging and comprehensible. Consistent with Adipat et al. (2021), teachers viewed gamification as a technology-enhanced approach that improves motivation and academic performance.

Teachers emphasized that gamification integrates game elements such as rewards, competition, and progress tracking to boost students' confidence, motivation, and engagement. This aligns with Olsson (2022), who noted that even simple game elements like badges and points can promote persistence. Participants highlighted that the reward system and interactive design of games sustain students' attention and enjoyment, encouraging active participation supported by Hui and Mahmud (2023).

Additionally, gamification was recognized as a means to stimulate motivation and excitement through progression-based activities, consistent with Ratinho and Martins (2023), who observed that points and leaderboards enhance extrinsic motivation. Teachers also mentioned the effective use of gadgets and digital tools to maintain student interest and encourage independent learning, supporting Thuy and Luu's (2021) conclusion that gamification fosters autonomy and intrinsic motivation. Overall, teachers perceived gamification as a fun, interactive, and motivating tool that reduces boredom and supports knowledge acquisition, in line with Adipat et al. (2021).

Influence of Gamification on ASD Students' Motivation and Engagement

There are two major themes that emerged from the findings: motivation and engagement.

Motivation

Teachers reported that gamification significantly enhanced students' motivation to participate and perform academically. Game elements such as points, rewards, rankings, and badges encouraged students to engage actively and strive for achievement. Tools like Kahoot were particularly effective, providing immediate feedback and fostering both intrinsic and extrinsic motivation, as supported by Alharthi (2020) and Bhuna (2023). This aligns with Self-Determination Theory (SDT), which suggests that fulfilling psychological needs such as competence, autonomy, and relatedness drives intrinsic motivation (Li et al., 2024).

Teachers also noted that gamified applications like Jolly Phonics made lessons enjoyable and improved literacy skills. Supporting studies (Htut, 2025; Hussein et al., 2023; Shroff et al., 2020) confirm that gamification enhances memory, engagement, and learning outcomes among special-needs students. Moreover, games were found to foster excitement, curiosity, and problem-solving skills, particularly in numeracy, aligning with findings by Rosil and Elpidang (2025) and Mee et al. (2020).

Eventually, the use of game elements such as leaderboards, levels, and feedback encouraged persistence and exploration, leading to increased motivation. However, as noted by Mee et al. (2020), gamification relying on rewards primarily stimulates extrinsic motivation, which may require continuous reinforcement to sustain engagement.

Engagement

Gamification also significantly improved student engagement in classroom activities. Teachers observed that ASD students became more attentive and interactive, particularly with visual and game-based learning materials. This supports Morais et al. (2023), who found that playful and competitive elements improve social, cognitive, and psychological skills. Teachers highlighted that gamified learning allows for personalised experiences, catering to students' sensory sensitivities and preferences. Studies by Salman et al. (2023) and Sorot and Tuli (2024) confirmed that personalised gamification enhances engagement, autonomy, and learning outcomes.

Furthermore, gamification promoted collaboration and communication among students. Group-based game activities encouraged teamwork, social interaction, and peer communication, which are skills often challenging for ASD learners. Studies by Pajarito et al. (2024), Zahid (2024), and Nasip and Zulkipli (2024) support that combining collaborative and competitive elements strengthens teamwork and engagement. Similarly, Wang et al. (2025) found that gamified interventions improve social and communication skills in individuals with autism.

CONCLUSION

ASD teachers perceive gamification as a beneficial, motivating, and inclusive teaching strategy that enhances both motivation and engagement. Through interactive, personalized, and reward-based experiences, gamification not only supports cognitive development but also fosters social interaction and emotional engagement among students with ASD.

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