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| RESEARCH ARTICLE

Enhancing Classroom Management and Student Engagement: The Role of ClassDojo and Gamification in Education

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| ABSTRACT
This study explores the effects of integrating ClassDojo, an AI-enhanced gamification platform, on classroom management and student engagement in a 6th-grade classroom. The primary objective is to evaluate how AI-driven features within ClassDojo impact student behavior, engagement, and classroom dynamics. A qualitative case study methodology was employed over four months in a classroom of 25 students in Casablanca. Data collection included direct classroom observations, semi-structured interviews, and analysis of behavioral data logged by ClassDojo. The findings indicate significant improvements in both student engagement and behavior management. Students demonstrated higher levels of self-regulation and motivation, with an increase in positive behaviors and a decrease in negative behaviors. The AI-driven personalization features of ClassDojo were particularly effective in fostering an engaging and responsive learning environment. These results align with previous research on the advantages of gamification and AI in educational settings. The study suggests integrating AI with gamification tools like ClassDojo can substantially enhance classroom management and student engagement. It encourages schools to consider the broader adoption of such technologies, accompanied by comprehensive teacher training, to maximize their benefits. Further research is recommended to assess AI-enhanced gamification's applicability and long-term impact across different educational settings.

| KEYWORDS

ClassDojo, AI, Classroom management, feedback, ICT

| ARTICLE INFORMATION

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1. Introduction

The complex dynamics of classroom management are universally recognized as pivotal in creating educational environments that nurture students' academic achievements and holistic development. Effective classroom management extends beyond mere organizational tactics, serving as a cornerstone for fostering enriching learning experiences that support students' cognitive and affective development. Classroom management strategies serve as a conduit for achieving educational objectives, impacting student behavior and engagement crucially (Smith & Jones, 2020). These strategies are instrumental in shaping environments that are conducive to learning, thereby directly influencing educational outcomes.

Further showing the transformative power of structured classroom management, recent studies have revealed that these strategies not only facilitate academic learning but also enhance social and emotional competencies. As Johnson and Collins (2018) assert, structured classroom management strategies are linked with improved student behavior, higher academic achievement, and enhanced emotional resilience. This powerful insight suggests that the methods teachers employ to manage their classrooms can profoundly impact students' educational experiences, aligning with the broader goals of education to support comprehensive student development.

In addition to direct classroom interactions, technological interventions such as ClassDojo have revolutionized classroom management by integrating real-time feedback systems that reinforce positive behavior and promote a cohesive learning environment. As noted by researchers, technological tools like ClassDojo have transformed traditional approaches to classroom management, enabling an interactive and adaptive learning environment that responds to the needs of both students and educators (Taylor, 2019).

2. Literature Review

The adoption of game elements in English language learning has not only captured the interest of many educational researchers and experts in Information and Communication Technology (ICT) Gee, 2003) but has also sparked a transformative shift in educational practices. Kapp (2012) describes this approach as integrating game-like mechanics, visuals, and strategic thinking to not just capture interest and spur action but to fundamentally enhance educational outcomes and address challenges. Terms like goal-focused, responsive to feedback, rule-centric, and entertaining have frequently characterized this educational approach (Prensky, 2001), showing its dynamic and engaging nature. This strategy has not just advanced education and learning but has revolutionized it, recognized as a compelling teaching methodology. It is seen as an influential means to foster positive changes in student behavior and attitudes toward education, contributing to tremendous academic success (Deterding, 2011). From one perspective, this approach positively impacts student behavior and motivation, enhancing their knowledge and abilities.

Additionally, considering the universality of games in various environments, such as homes and public spaces, the integration of gaming strategies in educational settings aids in simplifying the learning process for students (Sailer & Homner, 2019). This strategy is believed to positively influence students, helping them learn from classroom mistakes and supporting their emotional well-being and social development Gee (2003). Echoing these sentiments, Kapp (2012) notes that this method involves applying gaming elements and design principles in educational contexts. The intersection of ICT and language teaching has highlighted that the primary goal of this strategy is to increase student engagement and improve their problem-solving skills. It is widely acknowledged that incorporating gaming elements in educational practices can lead to numerous beneficial student outcomes.

2.1. Gamification in EFL: The ClassDojo Case

ClassDojo stands as a prominent online platform that is easily accessible via computers and mobile devices and is primarily designed for the delicate task of classroom management in English language teaching. Its unique functionality allows educators to monitor and adjust student behavior by a point-based system, catering to both positive and negative actions. Launched in August 2011, ClassDojo gained considerable traction and is used in most U.S. public schools (Chaykowski, 2017). This platform aligns educational instruction with student accountability, as teachers can reward or penalize students based on their behavioral patterns. This real-time feedback, evidenced by auditory cues for positive and negative behaviors, supports a focused approach to behavior-specific praise and redirection. Remarkably, ClassDojo is offered at no cost and has become a favored tool among educators, which is noted for its effectiveness in enhancing positive behaviors and reducing negative ones (Lunde, 2019). The tool's impact extends to fostering better relationships among students and teachers, improving social skills, and promoting self-regulation. Overall, ClassDojo has been recognized for its significant and diverse contributions to the educational environment (Hamari et al., 2014)

2.2. ClassDojo as a Classroom Management Enhancer

In classroom management, it is widely acknowledged that this aspect is integral to fostering an environment that supports students' academic, social, and emotional learning. Effective classroom management is a foundation for a structured learning environment necessary for students' overall development and well-being (Sieberer-Nagler, 2015). One of the critical roles of educators is to ensure a conducive learning atmosphere, as chaotic or disorganized environments can significantly hinder the learning process. Maintaining an orderly classroom is thus essential for effective teaching and learning to take place (George et al., 2017). ClassDojo has emerged as a critical tool in this context (DiGiacomo et al., 2021). It offers educators a platform to manage classroom dynamics efficiently, providing a structure through which student behavior can be monitored and influenced. This system is particularly beneficial in reinforcing positive behaviors and addressing negative ones, thereby directly impacting students' social and emotional development. By offering clear, consistent, and immediate feedback, ClassDojo helps create a positive classroom atmosphere where students can thrive academically and socially (Saeger, 2017).

Additionally, ClassDojo's platform aligns with the broader educational objective of creating a positive school climate. Fair and equitable discipline policies, like those facilitated by ClassDojo, are more effective than methods relying solely on reward or punishment (Williamson, 2017). It is also noteworthy that ClassDojo can be a part of schoolwide activities and policies that promote positive environments and contribute to students' overall emotional and social growth (Hamari et al., 2014) .

2.3. ClassDojo in Discipline Strategies

Behavior management systems, particularly classroom discipline, have sparked considerable debate in classroom management (Colțeanu, 2023). It is often argued that students are frequently penalized for certain undesirable behaviors, while positive behaviors tend to be overlooked. Studies suggest that reward systems usually fail to reinforce effectively. It has been observed that implementing class-wide interventions by teachers leads to more positive interactions within the classroom, thereby increasing student engagement (Conroy et al., 2019). This shift in classroom dynamics encourages students to remain focused and committed to learning appropriate behaviors, fostering a positive learning environment conducive to student engagement and learning. Research indicates that a significant portion of teachers in the U.S., approximately forty percent, report spending over half of their classroom time managing behavior instead of teaching, a factor contributing to their decision to leave the teaching profession (Chiong et al., 2017). Common disruptive behaviors such as talking out of turn, leaving one's seat, making noise, engaging in physical altercations, throwing objects, using inappropriate language, and shirking work are identified as key challenges in maintaining control during teaching sessions (Malloy et al., 2018). Further research, like (Malloy et al., 2018), advocate creating predictable, positive environments that cater to students' behavioral and academic needs as an effective preventative measure. In this context, the ClassDojo platform emerges as a potentially powerful tool for sustaining student engagement and fostering an interest in positive behavior by meticulously monitoring various aspects of the classroom environment (Brown, 2021).

2.4. AI in Education

Artificial Intelligence (AI) in educational technologies represents a paradigm shift in how educational content is delivered, personalized, and assessed. AI's potential in education is vast, encompassing data analysis, personalized learning paths, and adaptive feedback mechanisms. Luckin et al. (2016) emphasize that AI can "transform traditional educational practices" by making learning more personalized and accessible. Using machine learning algorithms and data analytics, AI can provide insights into students' learning patterns, predict learning outcomes, and identify areas where students may need additional support. Personalized learning becomes possible as AI tailors educational content to match each student's learning pace and style, addressing their specific needs and challenges. Baker and Siemens (2014) highlight the importance of AI in providing "real-time feedback and support to learners," further enhancing the learning process. Furthermore, AI can generate real-time, adaptive feedback for students, offering explanations, hints, or additional resources tailored to the student's responses. This dynamic interaction helps to create a more responsive and effective learning environment where students can learn from their mistakes and deepen their understanding of the subject matter ;

Incorporating Artificial Intelligence (AI) into educational technologies marks a watershed moment in the evolution of teaching and learning methodologies. This integration marks the dawn of a future where educational practices are delivered innovatively, highly personalized, and dynamically assessed, signifying a paradigm shift in educational paradigms.

The breadth of AI's application in education encompasses extensive data analysis, the creation of personalized learning trajectories, and deploying sophisticated adaptive feedback mechanisms. According to Luckin et al. (2016), AI has the potential to "transform traditional educational practices," making learning experiences more tailored and readily accessible than has previously been possible. This transformative capability of AI paves the way for a learning environment where content is not simply presented but customized to meet students' diverse needs and learning styles.

Harnessing the capabilities of machine learning algorithms and deep data analytics, AI can uncover patterns in students' learning behaviors, offering predictions on learning outcomes and pinpointing areas where learners may require additional support. This advanced level of personalization in education is groundbreaking. As Baker and Siemens (2014) articulate, AI's capacity to provide "real-time feedback and support to learners" significantly enriches the educational journey. AI's proficiency in adapting educational content to complement each student's pace and learning style is unparalleled, addressing individual educational needs and challenges with precision.

Moreover, AI's capability to furnish instantaneous, adaptive feedback transforms the educational landscape. This form of feedback is immediate and highly individualized, providing explanations, tips, and supplementary resources specifically relevant to the student's current learning context. Such interactive and responsive dialogue between AI systems and learners cultivates an environment conducive to deeper engagement and more effective learning. Students are thus encouraged to recognize and learn from their errors, deepening their understanding and mastery of the subject matter.

Introducing AI into educational settings extends beyond individualized learning paths and feedback mechanisms. It also signals the advent of innovative teaching methodologies and strategies, empowering educators to guide students through AI-crafted personalized learning experiences. This shift enhances the educational experience for students and enables teachers to address more nuanced pedagogical challenges, thereby enriching the overall learning ecosystem.

Furthermore, AI's adaptability in meeting the needs of an evolving educational environment—whether through integrating new technologies or aligning with contemporary pedagogical theories—shows its pivotal role in shaping the future of education. Beyond enhancing individual learning experiences, AI's capabilities in data analysis provide educators and institutions with critical insights into broader learning trends and outcomes. This macro perspective is invaluable for identifying systemic strengths and weaknesses within educational programs, facilitating targeted curriculum design, and improving teaching methodologies.

As educational technologies continue to advance, AI's role transitions from a mere adjunct to a central player in crafting the future of education, aiming for more engaging, accessible, and productive learning experiences for students globally. The integration of AI in education is not just an enhancement of existing practices but a revolution that promises a new era of learning characterized by greater adaptability, inclusivity, and efficiency.

2.5. AI and ClassDojo

To weave together the threads of AI's capabilities and the practical implementation of ClassDojo in the classroom, it's clear that ClassDojo stands as a fundamental bridge between traditional educational methods and the future potential of AI in education. By utilizing game-like elements and real-time feedback mechanisms, ClassDojo aligns perfectly with the dynamic and personalized learning environments that AI seeks to create.

As Gee (2003) notes, using gaming strategies in educational settings simplifies the learning process and significantly enhances student engagement and motivation. It is where precisely ClassDojo excels; it employs a points-based system and auditory cues that make the learning process both engaging and responsive, similar to the interactive experiences that AI aims to standardize in educational settings.

"By incorporating real-time data and feedback, ClassDojo facilitates an adaptive learning environment that can be seamlessly enhanced by AI technologies," as described by Baker and Siemens (2014). They emphasize that AI can provide "real-time feedback and support to learners," a philosophy that aligns seamlessly with the operational mechanics of ClassDojo, ensuring that each student's educational journey is as personalized and effective as possible.

Moreover, the AI's potential to transform ClassDojo extends to deeper analytics and more nuanced adaptations to learning content and methodologies. Luckin et al. (2016) highlight that AI can transform traditional educational practices by making learning more personalized and accessible, allowing for adjustments to academic content that respond directly to the students' needs. This approach is mirrored in how ClassDojo tracks and modifies student behavior, fostering an environment where students are engaged and continuously supported in their social and emotional development.

The integration of ClassDojo with AI represents a significant advance in educational technology, offering a glimpse into a future where education is not only about delivering content but doing so in a way that is dynamically tailored to the needs of each student. The potential for AI to enhance platforms like ClassDojo could revolutionize classroom management and learning processes, making education a more inclusive, engaging, and effective experience for all students. This synergy between AI and ClassDojo is positioned to dismantle traditional educational barriers and initiate a new era of teaching and learning that prioritizes personalized, adaptive, and engaging educational experiences.

2.6. Previous Studies on Gamification and AI in Educational Technologies

The intersection of gamification and artificial intelligence (AI) in educational technologies has attracted significant scholarly attention, yielding insights into their potential to transform learning environments. Gamification, or the application of game-design elements in non-game contexts, has enhanced student engagement and motivation across various educational settings. Hamari et al. (2014) provided a foundational meta-analysis, highlighting gamification's positive effects on engagement, although with variations across different contexts. Similarly, Dominguez et al. (2013) found that gamification significantly improved both student engagement and academic performance in a university-level course, showcasing its potential in higher education. Sailer et al. (2017) further explored the psychological mechanisms behind gamification's success, emphasizing the importance of aligning game design elements with intrinsic motivation and learning objectives.

Parallelly, AI's role in education, mainly through educational data mining and learning analytics, has been pivotal in personalizing learning experiences and improving academic outcomes. Baker and Siemens (2014) detailed how AI applications leverage data-driven insights to tailor learning paths to individual students' needs. Luckin et al. (2016) envisioned AI's transformative potential in education, advocating for its integration to enhance the personalization and accessibility of learning. Zawacki-Richter et al. (2019) categorized AI applications in higher education, noting a trend towards adaptive learning systems and intelligent tutoring systems, indicating AI's growing impact on educational experiences.

The fusion of AI with gamification opens new avenues for educational innovation. Bulger (2016) discussed how AI could amplify the benefits of educational games and simulations by enabling adaptive learning within gamified systems. Ibáñez et al. (2014) demonstrated this synergy in a MOOC, where AI-driven personalization in a gamified setting led to notable improvements in student motivation and engagement.

These studies collectively affirm the positive impact of gamification and AI in education. They show the need to apply and integrate these technologies to harness their full potential, suggesting a promising future for their role in enhancing educational experiences.

ClassDojo serves as a prime example of gamification, utilizing game-based mechanics to engage and motivate students effectively. As defined by Kapp (2012), gamification transforms learning environments into goal-oriented and feedback-driven spaces. ClassDojo, a practical application of gamification, enhances classroom dynamics by tracking student behavior with a points system, directly influencing student engagement and motivation. A study by Colao (2012) highlights ClassDojo's effectiveness in promoting positive behavior and developing supportive relationships within the classroom, enhancing both social skills and emotional resilience.

Chiarelli et al. (2015) found that ClassDojo effectively helped first graders self-monitor their behaviors during guided reading sessions. This tool enhanced classroom management by reducing disruptions and increasing student engagement.

The integration of ClassDojo within AI-enhanced gamified frameworks suggests a move towards more interactive educational practices. Benhadj et al. (2019) have documented significant improvements in discipline, motivation, and classroom participation in a Moroccan High School EFL classroom, illustrating the combined potential of gamification and AI.

3. Methodology

3.1. Research Design

This study adopts a qualitative case study approach to explore the integration of ClassDojo enhanced with artificial intelligence in a 6th-grade classroom setting. The case study method is chosen for its strength in providing in-depth insights into the processes and outcomes of educational interventions within natural settings (Yin, 2014). This approach allows for a detailed examination of the pedagogical interactions and student behaviors in response to implementing ClassDojo as a gamified learning and behavioral management tool.

3.2. Participants

The research was conducted in a single 6th-grade classroom of 25 students aged between 10 to 11. The study took place at a private school in Casa Blanca. The study lasted about four months. The Students were introduced to the platform called 'ClassDojo.' The classroom was a regular education classroom that served the instructional needs of 25 students throughout the day. The ClassDojo home screen was displayed on the interactive board throughout the session unless something instructional needed to be shown. When that happened, ClassDojo points were given through the teacher's phone with the application.

3.3. Research Question

Question 1: To what extent has integrating AI-enhanced features in ClassDojo impacted student engagement and behavior management in a 6th-grade classroom?
Question 2: How did students and teachers perceive the impact of ClassDojo on learning and classroom management?

3.4. Data Collection Methods

The researcher, who is also the classroom teacher, conducted direct classroom observations over a period of four months. Observations were scheduled during activities specifically designed to engage students using ClassDojo. These included sessions focused on group activities, individual tasks, participation, and general classroom management. The observations aimed to record changes in student engagement, motivation, discipline, and interaction with the gamified platform.

Semi-structured interviews were conducted with a purposive sample of 5 students. They included discussions about their experiences using ClassDojo, perceptions of its impact on their learning and behavior, and feedback on the AI-driven personalization aspects. Interviews were audio-recorded, transcribed verbatim, and lasted approximately 5-10 minutes each. The study also involved analyzing ClassDojo-generated data, including logs of student behavior, points awarded or deducted, and teacher notes on student performance and incidents. This data provided quantitative backing to the qualitative observations and interview narratives.

3.5. Data Analysis

Data collected through observations, interviews, and ClassDojo logs were analyzed to answer the research questions posed in this study. Thematic analysis was used to identify patterns and themes across the qualitative data collected through observations and interviews (Braun & Clarke, 2006). Initial codes were generated from the observation notes and interview transcripts, which were then grouped into potential themes that reflected the overarching impacts of the ClassDojo AI enhancements. Quantitative data from ClassDojo logs were used to triangulate the findings, providing a comprehensive understanding of the tool's impact on student behavior and engagement.

The thematic analysis began with a detailed coding process of the interview transcripts and observation notes. Each piece of data was examined for recurring patterns and themes related to student engagement, behavior management, and the educational impact of AI-enhanced ClassDojo.

4. Results and Discussion

Through the integration of ClassDojo, enhanced with AI-driven personalization, significant changes were observed in classroom behavior and student engagement. The analysis of behavior data, both qualitative and quantitative, revealed several key trends and outcomes.

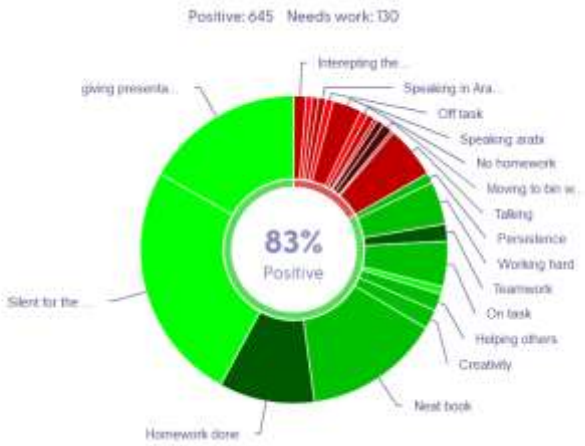
Figure 1

initial behavioral data

As illustrated in Figure 1, during the initial observation period, the proportion of positive behaviors recorded in the classroom was 54%, with a considerable amount of behaviors marked as "Needs work" (46%). These behaviors included frequent disruptions such as talking out of turn, moving in class without permission, and failing to complete homework.

Following the implementation of the AI-enhanced ClassDojo features, which provided real-time feedback and personalized rewards, there was a marked improvement in classroom dynamics.

Figure 2
initial behavioral data



As shown in Figure 2, positive behaviors increased to 83%, while negative behaviors significantly decreased. This shift highlights the effectiveness of real-time feedback in encouraging self-regulation and reinforcing positive behavior. Students frequently reported that ClassDojo significantly increased their engagement with learning activities. For instance, one student noted, "Getting personalized rewards and challenges made me want to participate more," illustrating how customization fosters a deeper engagement in classroom activities.

Observations and interviews highlighted that ClassDojo's real-time feedback system effectively helped students monitor and regulate their behavior. Teachers reported noticeable improvements in classroom discipline, stating, "Students were quicker to correct their behavior to gain points, showing increased self-regulation." Both students and the teacher remarked on the positive impact of gamification and AI on learning retention and understanding. "The instant feedback and rewards for correct answers help me remember information better," a student mentioned, showing the integrated technology's educational benefits. All five students commented, "ClassDojo makes learning fun and competitive, which really drives me to do my best."

The study's findings illustrate significant enhancements in classroom dynamics due to integrating AI-driven gamification using ClassDojo. The quantitative results indicated a marked increase in positive behaviors and engagement, aligning with prior research highlighting gamification's effectiveness in improving student motivation and learning outcomes (Hamari et al., 2014). Qualitative data further supported these findings, with both students and the teacher noting an improved learning atmosphere and increased student accountability for their actions.

The AI enhancements in ClassDojo, such as personalized feedback and adaptive learning opportunities, were particularly noted for their role in fostering a more engaging and responsive educational experience. It reflects the potential of AI to transform traditional educational practices by tailoring learning processes to individual needs (Luckin et al., 2016), thus enhancing the overall efficacy of gamification strategies.

The study also shed light on the impact of ClassDojo on students' social skills and emotional development. Observational data and interviews indicated that students were more engaged and demonstrated better self-regulation and interpersonal skills. These findings are consistent with previous studies that suggest effective classroom management tools like ClassDojo can significantly contribute to positive social and emotional learning environments (Chiarelli et al., 2015).

5. Conclusion

This study shows the transformative potential of integrating AI with gamification in education, as evidenced by implementing ClassDojo in a 6th-grade classroom. By enhancing engagement and motivation, improving behavioral management, and supporting social and emotional development, AI-enhanced gamification represents a significant advancement in educational strategies. As educational technologies continue to evolve, ongoing research and development will be essential in realizing their full potential in diverse educational settings.

The discussion of these findings not only reflects on the immediate impacts observed during this study but also sets the stage for further exploration into how such technological integrations can be optimized to enhance educational practices worldwide.

5.1 Theoretical and Practical Implications

Theoretically, this study contributes to the literature on educational technology by demonstrating how AI can enhance the effects of gamification in a real-world classroom setting. The findings suggest that schools should consider not only the adoption of such technologies but also focus on comprehensive training for teachers to maximize the benefits of AI and gamification.

Furthermore, the study highlights the importance of considering student feedback in developing and iterating educational technologies. Incorporating user-centered design principles can significantly enhance such tools' effectiveness and user acceptance (Ibáñez et al., 2014).

5.2 Limitations

While the findings are promising, the limitations of this study include its focus on a single classroom and a relatively short intervention period. Future research should look to replicate this study across multiple classrooms and extended time frames to test the reliability and long-term impacts of AI-enhanced gamification tools like ClassDojo.

Moreover, further investigation into the specific AI features that most effectively contribute to positive educational outcomes will be crucial. This could involve more detailed analytics to understand how different student demographics respond to various gamification and AI strategies.

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