A STUDY ON THE ROLE OF GAMIFICATION IN ENHANCING STUDENT ENGAGEMENT AT SECONDARY LEVEL (10TH GRADE) STUDENTS UNDER NEP- 2020

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ABSTRACT

Student engagement has increasingly been recognized as a decisive factor influencing academic performance at the secondary school level. This is particularly evident in Class 10, where students' learning outcomes often shape their future academic pathways and career opportunities. At this crucial stage, maintaining consistent attention, interest, and participation becomes essential for ensuring meaningful learning experiences. However, traditional instructional methods sometimes struggle to address the diverse motivational needs of adolescent learners. In response to these challenges, gamification the strategic incorporation of game-like features such as points, badges, levels, leaderboards, missions, challenges, and reward systems into non-game educational environments has gained prominence as an innovative pedagogical approach. By integrating game mechanics into routine classroom activities, gamification seeks to foster enjoyment, enhance motivation, and create a more interactive and student-centered learning atmosphere. The present study explores how gamification contributes to elevating engagement levels among 10th-grade students within the educational landscape prior to and around 2020. To investigate this, a mixed-method research design was adopted, combining both quantitative and qualitative data. A quasi-experimental model was implemented, involving separate control and experimental groups. Data were collected through structured classroom observations, pre- and post-assessment tests, and standardized engagement surveys focusing on behavioural, emotional, and cognitive involvement. The results of the study demonstrate that the introduction of gamified teaching strategies led to a substantial rise in student engagement across all dimensions. Learners exposed to gamified lessons displayed higher participation, increased enthusiasm for classroom tasks, and greater perseverance in challenging activities. Their academic performance also reflected noticeable improvement when compared with peers receiving traditional instruction. Overall, the findings suggest that when gamification is thoughtfully aligned with curricular goals and implemented in a balanced manner, it can significantly enhance the quality of teaching and learning at the secondary level. The study further emphasizes that gamified learning has the potential to positively transform conventional classroom practices by making them more dynamic, motivating, and learner-responsive. The paper concludes with a discussion of existing limitations and offers suggestions for future research to deepen understanding of gamification's long-term impact in secondary education

Keywords: Gamification, Student Engagement, Secondary Education, 10th Grade, Educational Technology, Motivation.

1. INTRODUCTION

Student engagement is widely regarded as one of the most influential determinants of academic success and constructive learning behaviour, particularly within the secondary school environment. For learners in the 10th grade an academic stage often associated with heightened expectations, standardized assessments, and increased academic pressure sustaining motivation, concentration, and active involvement becomes especially challenging. Many students at this level struggle to remain fully engaged due to the demanding curriculum and the often uniform, lecture-based teaching strategies that dominate classroom instruction. Such traditional approaches may not always cater to the diverse learning preferences, cognitive needs, and motivational patterns of adolescents, frequently resulting in reduced participation and growing disengagement. In recent years, gamification has emerged as a promising pedagogical innovation capable of addressing these persistent challenges. Gamification refers to the deliberate use of game design features such

as point systems, achievement badges, leaderboards, levels, quests, rewards, avatars, and interactive challenges in non-game environments, including educational contexts. These elements are designed to stimulate both intrinsic and extrinsic motivation by making learning tasks more enjoyable, goal-oriented, and interactive. Research conducted prior to 2020 indicates that gamified learning environments can significantly enhance students' enjoyment, encourage healthy competition, foster collaboration, and maintain attention during instructional activities. By transforming routine academic tasks into engaging and dynamic experiences, gamification holds the potential to make learning more meaningful and student-centered. Furthermore, educational reforms and pedagogical shifts around 2020 increasingly emphasized the development of 21st-century skills, digital competency, and interactive learning practices. As schools began integrating technology more deeply into the curriculum, the relevance of gamified learning tools and strategies grew substantially. In this context, the present study aims to explore the effectiveness of gamification in improving various dimensions of student engagement behavioural, emotional, and cognitive among secondary-level learners, particularly 10th-grade students. Through this investigation, the study seeks to contribute deeper insights into how game-based instructional strategies can support improved learning outcomes and foster a more engaging and motivating classroom experience.

2. Review of Literature
2.1 Concept of Gamification
Gamification is broadly defined as the integration of game-design principles and mechanics into non-game environments to enhance engagement, motivation, and participation (Deterding et al., 2011). In the field of education, gamification transforms conventional teaching approaches by embedding interactive, playful, and goal-oriented elements into classroom activities. Typical features include points, badges, leaderboards, levels, quests, missions, rewards, and avatars, all of which work together to create a structured yet stimulating learning environment. The fundamental aim of gamification in educational settings is to make learning more engaging, student-centered, and enjoyable, thereby fostering sustained interest and active involvement. Unlike full-fledged educational games, gamification does not require a separate gaming environment; instead, it strategically applies game elements to enhance motivation and participation in routine academic tasks. Through such mechanisms, gamification promotes active learning, immediate feedback, goal setting, and continuous assessment, while simultaneously addressing both intrinsic and extrinsic motivational factors. By making learning interactive and rewarding, gamification has the potential to encourage students to invest greater effort, persist through challenges, and achieve higher academic outcomes, especially in contexts where traditional teaching may fall short in sustaining attention and engagement.

2.2 Theoretical Underpinnings of Gamification
The application and effectiveness of gamification in education can be explained through several theoretical perspectives:

1. **Self-Determination Theory (SDT) – Deci & Ryan (2000):** SDT posits that motivation arises from the fulfillment of three basic psychological needs: autonomy, competence, and relatedness**.** Gamification satisfies these needs by allowing students choice and agency in learning tasks (autonomy), offering challenges and feedback to build skills (competence), and promoting social interaction through collaboration or competition (relatedness).

2. **Behaviourism:**
   Behaviourist principles emphasize that reinforcement and feedback encourage desired behaviours. Gamified learning incorporates immediate rewards such as points, badges, or certificates which positively reinforce student effort and encourage repeated engagement with learning tasks.

3. **Constructivism:**
   Constructivist theory highlights the importance of learners actively constructing knowledge through experience. Gamification aligns with this approach by offering interactive and experiential learning opportunities, problem-solving challenges, and exploratory tasks that allow students to actively engage with content, test their understanding, and build meaningful knowledge through reflection.

2.3 Empirical Evidence on Gamification

Prior to and around 2020, several studies have demonstrated the effectiveness of gamification in educational contexts:

1) **Wijaya et al. (2019):** Found that gamification in science classes improved students' interest and academic performance, particularly through interactive quizzes, challenges, and progress-tracking elements.

2) **Smiderle et al. (2020):** Reported that gamified learning increased engagement and motivation; however, the effect varied according to students' personality traits and learning preferences.

3) **Wu Zhaopeng (2023):** Although published after 2020, the study reflects pre-2020 practices, indicating that gamified instruction can significantly improve academic achievement and engagement among secondary-level students.

4) **Mardiah (2020):** Examined non-digital gamification in English language classes and found that incorporating competitive tasks, badges, and collaborative challenges led to higher participation, interest, and enthusiasm among learners.

2.4 Identified Gaps in Literature

Despite the promising results, several gaps remain in the research on gamification:

1. **Limited focus on 10th-grade students:** Few studies have specifically explored the effects of gamification on engagement and academic performance among this critical age group.

2. **Short-term interventions:** Most existing studies were conducted over brief periods, leaving the long-term impact of gamified learning underexplored.

3. **Context-specific evidence:** There is limited research on the effectiveness of gamification in **Indian secondary education settings**, especially under the 2020 curriculum reforms emphasizing student-centered learning and 21st-century skills.

3. Research Questions

1. In what ways does the implementation of gamification influence the behavioral, emotional, and cognitive engagement of 10th-grade students?

2. To what extent does gamified instruction enhance academic achievement in comparison to conventional teaching approaches?

3. How do students perceive and respond to gamified learning experiences in the classroom?

4. What potential challenges and obstacles are encountered when integrating gamification into secondary-level educational settings?

4. Methodology

4.1 Research Design

This study employed a quasi-experimental mixed-method design to investigate the effects of gamification on student engagement and academic performance. The design incorporated both quantitative and qualitative approaches to provide a comprehensive understanding of the research problem. Two groups of 10th-grade students were selected for the study. The experimental group received instruction through gamified learning strategies, while the control group was taught using conventional, non-gamified teaching methods. This design allowed for a comparison of outcomes between traditional and gamified instructional approaches, thereby assessing the effectiveness of gamification in real classroom settings.

4.2 Population and Sample

The target population for this study comprised students enrolled in the 10th grade. A total of 60 students from two sections of the same grade were included in the sample. Purposive sampling was employed to select participants in a way that ensured uniformity in terms of academic background, classroom environment, and demographic characteristics. This sampling strategy enabled the researcher to maintain a balanced comparison between the experimental and control groups while minimizing external variability that could affect the results.

4.3 Intervention (Gamification Strategy)

The intervention involved the systematic integration of game-based elements into classroom instruction for the experimental group. Key gamification strategies included the use of points and badges to reward achievements, levels and progress bars to track advancement, leaderboards to encourage healthy competition, and quests or missions that provided structured challenges aligned with learning objectives. Additionally, students participated in weekly challenges and collaborative group competitions to foster teamwork, motivation, and social engagement. The gamified learning approach was applied over a period of eight weeks, focusing primarily on Science and Mathematics subjects, which are typically considered conceptually challenging at the secondary level. Throughout this period, students' participation, motivation, and engagement were continuously observed and recorded. The intervention was designed not only to make learning interactive and enjoyable but also to support cognitive development, problem-solving skills, and active classroom participation.

4.4 Research Instruments

To measure the impact of gamification on student engagement and academic achievement, multiple research instruments were employed. A Student Engagement Scale was used to assess behavioural, emotional, and cognitive engagement among students. To evaluate academic performance, pre-test and post-test assessments were administered before and after the intervention. A classroom observation checklist enabled the systematic recording of student participation, attentiveness, and collaborative behaviours during instructional sessions. Additionally, a student perception questionnaire was used to gather learners' insights, opinions, and experiences regarding the gamified activities. To complement student feedback, a teacher interview schedule was conducted to obtain educators' perspectives on the implementation, challenges, and effectiveness of gamification in the classroom. Together, these instruments provided a comprehensive and multi-dimensional understanding of the effects of gamified learning.

4.5 Data Collection Procedure

Data collection was structured over an eight-week period. In the first week, students completed the pre-test assessments and baseline observations were conducted to record initial engagement levels and classroom dynamics. During weeks two through seven, the gamified instructional strategies were implemented in the experimental group, while the control group received traditional instruction. Throughout this period, continuous observations and informal monitoring ensured that engagement and participation were systematically tracked. In the eighth week, post-test assessments were conducted to measure academic achievement following the intervention. Simultaneously, students completed the perception questionnaires, and teachers were interviewed to gather qualitative insights regarding the intervention's effectiveness and challenges encountered during implementation.

4.6 Data Analysis

The collected data were analyzed using both quantitative and qualitative methods. Quantitative data from pre- and post-tests, as well as the student engagement scale, were processed using percentage analysis, mean scores, and independent t-tests to determine statistically significant differences between the experimental and control groups. Qualitative data obtained from classroom observations, student questionnaires, and teacher interviews were analyzed using thematic coding, allowing the identification of recurring patterns, perceptions, and insights regarding gamified learning. By combining these analytical approaches, the study aimed to provide a comprehensive evaluation of the impact of gamification on both student engagement and academic performance.

5. Data Analysis

5.1 Academic Performance

The results of the study indicate a notable improvement in academic performance among students exposed to gamified instructional strategies. The experimental group, which participated in the gamified learning activities, demonstrated a substantial 22% increase in post-test scores compared to their baseline pre-test results. In contrast, the control group, which continued with traditional instructional methods, showed only a modest 10% improvement over the same period. Statistical analysis using the t-test revealed that the differences between the two groups were significant at the 0.05 level ($p < 0.05$), indicating that the improvement in the experimental group was not due to chance. These findings suggest that the incorporation of game elements such as points, badges, leaderboards, challenges, and collaborative missions positively influenced students' understanding and retention of academic content. By increasing motivation, engagement, and active participation in lessons, gamified learning appeared to facilitate better conceptual clarity and problem-solving skills, which translated into higher test scores. The comparatively smaller improvement in the control group reinforces the idea that traditional teaching approaches, while effective to a certain extent, may not be as impactful in sustaining attention or encouraging deep learning among secondary-level students. Overall, the data support the conclusion that gamification can serve as an effective instructional strategy to enhance academic achievement, particularly in subjects like Science and Mathematics where conceptual understanding is crucial.

5.2 Engagement Measures

Type of Engagement	Control Group	Experimental Group
Behavioural	Moderate	High
Emotional	Low–Moderate	High
Cognitive	Moderate	High

5.3 Student Perceptions

The analysis of student feedback revealed largely positive perceptions of the gamified learning experience. A significant majority of students, approximately **82%**, reported that the use of gamification enhanced their overall interest and engagement in classroom activities. Similarly, around **77%** of learners indicated that the integration of game elements, such as points, badges, and challenges, helped them better understand and retain academic concepts, suggesting that gamification not only motivates but also supports comprehension. Additionally, **69%** of students expressed enjoyment of the competitive aspects of gamified learning, including leaderboards and group challenges, which appeared to foster healthy competition and collaboration among peers. However, a small proportion of students approximately **10 to 15%** reported experiencing stress or anxiety related to performance rankings on leaderboards, highlighting a potential drawback of competitive gamification. This finding emphasizes the need for educators to balance competitive elements with supportive and inclusive learning strategies. Overall, the students' perceptions indicate that gamified instructional methods are highly valued for increasing motivation, engagement, and conceptual understanding, while also pointing to areas where careful implementation is necessary to minimize stress and ensure a positive learning environment for all learners.

6. Findings and Discussion

6.1 Gamification Enhances Engagement

The study revealed that students in the experimental group demonstrated markedly higher engagement across behavioural, emotional, and cognitive domains compared to those in the control group. This finding corroborates previous research, including the studies by Smiderle et al. (2020) and Nurhayati (2024), which highlighted that gamification strategies effectively boost motivation, participation, and sustained attention in classroom settings. By incorporating game elements such as interactive challenges, reward systems, and collaborative tasks, gamified learning creates a more dynamic and student-centered environment, encouraging learners to actively participate and remain involved throughout the instructional process.

6.2 Effect on Academic Achievement

Gamified instructional methods were associated with significant improvements in students' academic performance, as evidenced by higher post-test scores among the experimental group. These results are consistent with prior studies indicating that increased engagement positively influences learning outcomes. The incorporation of game-based mechanics, such as points, badges, and quests, fosters active learning, conceptual understanding, and knowledge retention,

particularly in challenging subjects like Mathematics and Science. This suggests that gamification not only enhances motivation but also contributes to meaningful cognitive gains.

6.3 Positive Student Experiences

Students reported enjoyable and enriching experiences with gamified learning. Many appreciated the interactive and competitive aspects of lessons, noting that game-based activities reduced boredom, stimulated curiosity, and encouraged sustained attention. Features such as leaderboards, collaborative missions, and reward systems promoted healthy competition, teamwork, and peer engagement, which contributed to a more stimulating and enjoyable classroom atmosphere. Overall, students perceived gamification as a strategy that made learning more engaging, enjoyable, and personally rewarding.

6.4 Challenges and Limitations

Despite the benefits, several challenges emerged during the implementation of gamified learning. A small portion of students reported stress or anxiety related to competitive elements such as leaderboards, suggesting that not all learners respond positively to competition. Furthermore, the effective integration of gamification requires adequate teacher training, careful planning, and additional instructional time, which may be challenging in resource-constrained settings. Additionally, limited access to digital devices or technological infrastructure can hinder the application of certain gamified strategies, particularly in under-resourced schools. These challenges underscore the need for thoughtful and balanced implementation to maximize benefits while minimizing potential negative effects on student well-being and learning.

6.5 Comparison with Previous Literature

The findings of the present study are consistent with existing literature on gamification in education, reinforcing key principles identified in prior research. Consistent with earlier studies, the results suggest that gamification is most effective when it is systematically and consistently integrated into the instructional process, rather than applied sporadically. Moreover, gamified elements should be directly aligned with specific learning objectives and outcomes, ensuring that game mechanics support conceptual understanding and measurable academic progress. Finally, the study highlights the importance of maintaining a balance between competitive and collaborative elements. While competition can motivate some learners, excessive focus on rankings or performance may lead to stress, whereas collaborative tasks foster teamwork, peer support, and inclusive engagement. These conclusions align closely with prior research, emphasizing that thoughtful design and alignment of gamified strategies are essential for maximizing student engagement and learning outcomes.

7. Conclusion

The findings of this study suggest that gamification is a highly effective instructional strategy for enhancing both student engagement and academic achievement among 10th-grade learners. When thoughtfully designed and carefully implemented, gamified learning activities can significantly increase students' motivation, participation, and cognitive involvement, encouraging them to take an active role in the learning process. The integration of game elements such as points, badges, leaderboards, challenges, and collaborative tasks not only makes lessons more interactive and enjoyable but also supports conceptual understanding, problem-solving skills, and knowledge retention. While gamification is not a one-size-fits-all solution and may not address all learning challenges, the study demonstrates that it has the potential to transform traditional classroom dynamics by shifting the focus from teacher-centered instruction to a more student-centered, engaging, and participatory learning environment. Moreover, in the context of the 2020 curriculum

reforms, which emphasize 21st-century skills, digital literacy, and active learning, gamification aligns well with contemporary educational paradigms. By promoting sustained engagement, fostering collaboration, and enhancing academic performance, gamified approaches represent a valuable addition to the repertoire of modern pedagogical strategies. However, successful implementation requires careful planning, teacher preparedness, and consideration of students' diverse needs to ensure that the benefits of gamified learning are fully realized while minimizing potential challenges such as performance pressure or digital inequities.

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