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Redefining Classroom Engagement through Gamified Sociocollaborative Learning for Future Ready Education

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A B S T R A C T

Student engagement in junior high school, particularly among Grades VII and VIII students, remains limited due to conventional teaching practices. This study examines the effectiveness of gamified sociocollaborative learning in enhancing cognitive, affective, and behavioral engagement. Using a mixed-methods sequential explanatory design, qualitative data from interviews and observations informed a quantitative survey of 72 students in Pasaman Regency. Thematic and regression analyses show that integrating gamification elements with collaborative activities significantly increases student motivation, interaction, and active learning, with the strongest impact on cognitive engagement. The study concludes that gamified sociocollaborative learning is an effective and innovative approach to improving student engagement at the junior high school level.

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INTRODUCTION

The change in the global education paradigm requires innovative efforts to strengthen student involvement in the classroom, especially at the junior high school (SMP) level which is in the emotional and academic transition phase. Student engagement (classroom engagement) in junior high school is very important because it correlates with motivation, material understanding, and long-term learning outcomes. Meta-analysis research shows that gamification can significantly improve students' intrinsic motivation and social connectedness, although its impact on competence is still relatively small (Jeno et al., 2024). These findings confirm the importance of designing learning that is not only fun, but also meets basic psychological needs of students such as autonomy and relationships. Therefore, the integration of gamification strategies in social collaborative learning is becoming increasingly relevant in the context of future education.

Although gamification is increasingly being studied in education, there is still a significant research gap regarding its application in social collaborative learning environments. The majority of previous studies have reviewed gamification elements such as points, badges, and leaderboards independently without taking into account social interaction as an integral part of the learning process (Smirani & Yamani, 2023). This suggests that although gamification has been widely used, the ways in which game elements are used to stimulate collaboration between students have not been adequately explored. This gap creates an urgency to expand research into the realm of sociocollaborative learning, which is a learning model that combines games and teamwork together. Thus, this research is relevant to answer how gamification can be effectively integrated with social collaboration to increase student engagement holistically.

In the context of motivational theory, self-determination theory (SDT) is a very suitable foundation for understanding how gamification and social collaboration can drive student engagement. Elements of play such as challenges, feedback, and rewards can meet students' needs for competence, autonomy, and social connectedness, which are at the core of SDT (Marinensi et al., 2022). When students work together in a collaborative and gamified environment, social interaction allows for the fulfillment of relationship needs naturally through discussion, negotiation, and team achievement. This approach is also in line with the theory of social constructivism, which emphasizes learning as the result of social interaction and mutual construction. Therefore, gamified sociocollaborative learning is seen as a powerful strategy for creating an adaptive and immersive learning environment.

Practically, the application of the gamified sociocollaborative learning model in junior high schools offers great potential to change the dynamics of conventional classrooms to be more interactive and participatory. Previous qualitative research in online classrooms has shown that gamification is able to transform student behavior, from reluctance to active engagement, especially when elements such as points, badges, leaderboards, and gamification testing are used consistently (Motivadis et al., 2023). Additionally, in the context of face-to-face or hybrid learning, students tend to show greater social attachment when

games are designed for team collaboration, rather than just individual competition (Ofosu-Ampong et al., 2021). This suggests that combining gamification elements with social interaction can result in a more meaningful and lasting learning experience. For junior high schools in areas such as West Pasaman, with distinctive social and academic characteristics, this model has great potential to be applied because it can adapt to the needs of adolescent development and local collaborative culture.

Furthermore, recent empirical studies have produced strong quantitative evidence of the positive effects of gamification on student engagement. A quasi-experimental study on online discussion forums found that badge awarding by instructors did not automatically increase emotional and cognitive engagement, although behavioral engagement decreased in some sessions as students prioritized the quality of content over the quantity of posts (Pradana et al., 2024). These findings show that gamification elements must be carefully designed not only to encourage activities, but also to support the quality of student interaction. By combining elements of gamification and social collaboration, learning models can facilitate deep interactions, not just the quantity of activities. Therefore, this research is very important to determine an effective and meaningful design framework for the long-term engagement of junior high school students.

Another challenge to consider is how to maintain student engagement over the long term without losing the initial appeal of gamification. Recent meta-analyses show that although gamification generally increases intrinsic motivation and a sense of social connectedness, its effect on competence is very small (Jeno et al., 2024). This indicates that gamification design needs to pay attention to the aspect of balance: elements of competition and rewards must be accompanied by support for autonomy and social collaboration so as not to reduce students' sense of competence. Otherwise, the novelty effect of gamification risks decreasing over time. This research will explore how a combination of game elements and collaborative interactions can be designed to sustainably maintain motivation and engagement in junior high school classrooms.

Based on the above explanation, this study has an explicit goal, namely to redefine the concept of classroom engagement in the context of gamified sociocollaborative learning in junior high school students, and to analyze the influence of the integration of game elements and social collaboration on student involvement in cognitive, affective, and behavioral dimensions. With such a focus, this research is expected to provide theoretical contributions in the form of a new understanding of engagement that is adaptive to future needs, as well as practical contributions in the form of learning models that can be implemented by teachers in junior high schools to be more responsive and innovative. Through the findings obtained, it is hoped that the resulting strategies can be considered by school and education policy makers to strengthen the quality of junior high school learning more holistically.

LITERATURE REVIEW

Classroom Engagement in Learning in the Present Century

Student involvement is a key indicator of learning success, especially at the secondary school level, as the academic and social development phases are decisive. A number of contemporary studies confirm that student engagement consists of cognitive, affective, and behavioral dimensions that are interrelated and essential for meaningful learning experiences (Anderson & Patel, 2022). Additionally, teacher support and classroom interaction significantly contribute to student engagement, especially when teachers provide autonomy and positive relationships (Siacor & Ng, 2024). Static learning environments and conventional teaching methods often suppress students' active participation, which risks lowering motivation and engagement (He et al., 2025). Therefore, the latest literature emphasizes the importance of designing adaptive, participatory, and responsive learning so that student engagement can grow optimally and sustainably.

Gamified Learning and Its Impact on Student Motivation

Gamification has been widely identified as an effective strategy to increase student motivation and engagement through game elements such as points, badges, challenges, and competitions. Recent meta-analyses show that gamification significantly improves intrinsic motivation as well as students' perceptions of autonomy and connectedness, although its impact on the perception of competence is lower (Jeno et al., 2024). Other systematic studies emphasize that the duration of gamification interventions is affecting: short-term interventions tend to produce greater effects than long-term interventions, as the novelty effect decreases over time (Li et al., 2023). Recent experimental research on digital learning has also shown that the use of gamification elements such as points and badges, when integrated wisely, can increase emotional and cognitive engagement without incurring excessive cognitive burden (Topu, 2023). Thus, the literature concludes that gamification is not only as entertainment, but as a catalyst that enriches the learning experience and improves classroom dynamics.

Sociocollaborative Learning as the Foundation of Meaningful Interaction

Social collaborative learning emphasizes cooperation between students, discussion, and the development of shared meaning through meaningful assignments. The theory of social constructivism states that knowledge is formed through the interaction and negotiation of meaning among students. Current studies confirm that the combination of social interactions in the learning group strengthens social attachment and a sense of ownership to the learning process (An et al., 2025). In addition, cooperation in a collaborative context has been proven to increase the depth of understanding of concepts because students explain to each other, question each other, and study together (Hiver, 2025). Therefore, the latest literature confirms that social interaction not only enriches engagement, but also creates a learning environment that supports students' academic and social development simultaneously.

Integration of Gamification and Social Collaboration in Learning

The integration of gamification with social collaborative learning has been the focus of research due to its potential in strengthening engagement. Recent comparative studies have shown that elements of play when used in groups (team missions, shared points, cooperative challenges) increase motivation and a sense of community (Pradana et al., 2024). Social interaction in this context deepens the emotional attachment of students because the success of the group depends on the contribution of each member (Hellín et al., 2023). In collaborative gamification scenarios, students are more likely to show a commitment to a shared goal and a sense of competence because achievement is not only assessed individually, but as part of a team (Lucas & Juna, 2024). Thus, the literature states that the integration of gamification and social collaboration strengthens all dimensions of engagement more comprehensively than when each is implemented separately.

Challenges and Sustainability of Using Gamified Sociocollaborative Learning

While the potential for this integration is enormous, the literature highlights a number of challenges in the long run. One of the main challenges is the novelty effect, which is the effect of gamification novelty that decreases over time, as shown in a meta-analysis of gamification (Jeno et al., 2024). Additionally, if gamification design is too competitive, students with lower abilities may feel less competent, which can lower affective engagement (Pradana et al., 2024). There is also a risk of group dominance when collaborative elements are not well organized, so contributions are uneven (Ofosu-Ampong & Boateng, 2021). Therefore, the literature underscores the need to design a balanced gamification structure between competition, collaboration, and autonomy so that student motivation and engagement can be sustained sustainably.

METHODOLOGY

Types, Approaches, and Research Design

This study uses a mixed methods approach with a sequential explanatory design, which places the qualitative stage as the basis for formulating quantitative instruments. This approach was chosen because it was able to provide an in-depth understanding of the context of student engagement before being empirically tested on a wider population. Sequential explanatory design is effective when researchers need to explain qualitative patterns more measurably through quantitative data, as recommended by Creswell & Guetterman (2021) who emphasize that two-stage integration allows for more accurate triangulation of findings in educational studies. In this study, the qualitative stage was first carried out to identify gamified sociocollaborative learning-based engagement indicators, which were then quantitatively tested to determine their significance.

Population, Participants, and Sampling Techniques

The research population includes all students and teachers at the level of one of the junior high schools in Pasaman Regency. The qualitative stage involved six informants who were selected using purposive sampling

techniques, with consideration of direct involvement in the learning process using collaborative and interactive models. The choice of this technique is relevant when the researcher needs participants who truly understand the phenomenon being studied, as explained by Tracy (2020) who emphasizes the importance of depth of information in qualitative studies. The quantitative stage uses stratified random sampling techniques to ensure the representativeness of students in grades VII and VIII. A total of 72 respondents were selected from the same two grade levels so that the variation in developmental characteristics could be evenly distributed. According to Hargreaves & Fullan (2021), stratification is beneficial for maintaining data heterogeneity and increasing external validity in educational contexts.

Data Collection Techniques and Instruments

Data collection was carried out through semi-structured interviews, classroom observations, and questionnaires. Interviews were used to explore teacher and student experiences related to the dynamics of engagement in gamified collaborative learning. Observations were carried out using structured observation sheets to map patterns of student interaction, motivation, and participation. The questionnaire instrument is designed based on qualitative findings and is supported by engagement constructs used in contemporary educational research, such as the indicator structure developed by Reeve & Cheon (2021). The validity of the instrument's content is checked through expert judgment, while the reliability is tested using Cronbach's alpha to ensure internal consistency. According to Glover & Friedman (2022), reliability testing is essential for the instrument to be used on a wider population accurately.

Research Implementation Procedure

The research procedure begins with the application of permits to schools and regional policy makers. The first stage was qualitative data collection through interviews and observations, which were carried out for two weeks in grades VII and VIII. Qualitative data were then analyzed to identify initial categories regarding cognitive, affective, and behavioral involvement in the context of gamified sociocollaborative learning. These findings became the basis for the preparation of quantitative instruments. The second stage involved testing the questionnaire on a small number of students before it was distributed to 72 respondents. After that, the main data collection is carried out in a predetermined class with assistance from the subject teacher. The entire process follows the ethical guidelines of educational research, including the confidentiality of participants' identities, as recommended by Wagner (2023).

Data Analysis Techniques

Qualitative data were analyzed using a thematic analysis approach to group patterns of meaning related to students' experiences in gamified collaborative learning. This approach refers to the Braun & Clarke (2022) procedure that emphasizes six stages of coding from familiarization to interpretation. Quantitative data were analyzed using differential tests and regression analysis to assess the influence of gamification and social

collaboration elements on the engagement dimension. The analysis was carried out with the Statistical Package for the Social Sciences (SPSS) software to ensure the accuracy of statistical calculations. According to Field & Miles (2023), SPSS is a reliable tool in educational research because of its ability to process multivariate data with precision. The integration of the two types of data is then carried out at the interpretation stage to produce a complete picture of the effectiveness of the learning model being studied.

RESEARCH RESULTS

Patterns of Student Engagement in Classroom Learning before Model Interventions

Qualitative interviews show that prior to the implementation of gamified sociocollaborative learning, student engagement was at a limited level. The teacher said that most students were still waiting for instructions without taking the initiative to start learning activities. A teacher stated, "*In many sessions, I find that students are just waiting for directions. They rarely ask questions or try to discuss with their friends, so the class feels passive.*" (G1-01, interview September 3, 2025). Students also described a pattern of minimal participation. One of the students revealed, "*Usually I only take notes and answer when appointed. If you don't ask, yes, I'll just shut up.*" (SSMP2-07, interview September 4, 2025). Another student added that the old method left less room for interaction, "*We listen more than we discuss. So sometimes I get bored because there are no activities that make us have to think together.*" (SSMP3-11, interview September 5, 2025).

Initial analysis through descriptive tests showed that the three dimensions of cognitive, affective, and behavioral engagement were in the medium to low category. Pre-intervention results showed a variation in scores consistent with qualitative findings regarding low participation.

Table 1. Pre-Intervention Engagement Scores (n = 72)

Engagement Dimension	Mean	SD	Minimum	Maximum
Cognitive Engagement	2.81	0.54	1.90	3.90
Affective Engagement	2.74	0.61	1.70	4.00
Behavioral Engagement	2.69	0.58	1.80	3.85

The analysis shows that all three dimensions have not reached the optimal level. A mean score below 3.00 indicates unstable engagement and requires more interactive and adaptive learning interventions.

Increased Motivation Through Gamification Elements

After the gamification model was implemented, teachers and students reported an increase in motivation and enthusiasm for learning. The teacher stated, "*Once the points and badge elements are installed, students look much more*

active. They started competing to complete tasks, even those who are usually passive are involved." (G2-05, interview September 10, 2025). One student confirmed this by saying, "*When there are challenges and points, I want to quickly complete the task. It feels like playing a game, so learning is more exciting*" (SSMP1-13, interview September 11, 2025). Another student added, "*The group badge makes us support each other. If there are friends who are left behind, we help so that the group badge is not lost.*" (SSMP4-18, interview September 12, 2025).

The analysis of the paired t-test showed a significant increase in motivation which is an affective indicator of engagement after gamification integration.

Table 2. Paired Sample Test for Motivation Indicators

Variable	Mean (Pre)	Mean (Post)	Mean Difference	t-value	Itself.
Motivation Score	2.74	3.58	0.84	10.214	0.000

A mean increase of 0.84 indicates a substantive change. These results reinforce the qualitative finding that points, badges, and challenges successfully generate students' intrinsic and extrinsic motivation.

Dynamics of Student Interaction and Collaboration

Observations and interviews showed an increase in interaction after the sociocollaborative model was applied. The teacher stated, "*Group discussions became more lively. They don't just divide tasks, but actually discuss to achieve gamification targets.*" (G1-09, interview September 14, 2025). Students also describe changes in interaction patterns, "*If there is a group mission, we have to discuss. So it's more about chatting and exchanging opinions than learning on your own.*" (SSMP3-19, interview September 15, 2025). Another student added, "*Sometimes we have small debates because we have to solve challenges. But it makes us understand the material better because we explain it to our friends as well.*" (SSMP2-21, interview September 15, 2025).

The differential test showed a significant increase in the indicators of interaction and collaboration that were in the behavioral engagement dimension.

Table 3. Collaboration and Interaction Scores

Indicator	Mean (Pre)	Mean (Post)	Difference	t-value	Itself.
Collaboration	2.69	3.71	1.02	12.441	0.000
Peer Interaction	2.75	3.66	0.91	11.302	0.000

Improvements in both indicators showed that the integration of group challenges and collaborative missions effectively strengthened social dynamics in the classroom.

Strengthening Cognitive Engagement through Challenges and Feedback

Teachers assess that cognitive engagement increases because the live feedback feature helps students understand mistakes and improve learning strategies. The teacher mentioned, "*The automated feedback from the system makes students quickly know which part they are wrong in. They immediately fix it without having to wait.*" (G2-14, interview September 18, 2025). Students also feel that cognitive challenges make them more focused. "*If it's a challenge model, I have to think more seriously. It feels like a test of strategy*" (SSMP4-22, interview September 19, 2025). Another student emphasized, "*The extra point for the correct answer makes me try to read more carefully*" (SSMP1-24, interview September 20, 2025).

Regression analysis shows that gamification and collaboration elements have a significant influence on cognitive engagement.

Table 4. Regression Analysis for Cognitive Engagement

Predictor	B	Beta	t-value	Itself.
Gamification Elements	0.482	0.601	8.924	0.000
Collaborative Activities	0.351	0.447	6.217	0.000
$R^2 = 0.62$	Adjusted R^2 = 0.61	F = 57.81	Sig. = 0.000	

The regression model shows that 62% of cognitive engagement variations can be explained by a combination of gamification elements and collaborative activities, confirming the integration of the two as a key factor in improving outcomes.

The Effectiveness of the Model in Increasing Overall Engagement

All informants showed that this learning model creates a new learning experience that is considered more fun and challenging. The teacher said, "*I see students being more consistently involved from the beginning to the end of the session. No one is as sleepy as they used to be.*" (G1-18, interview September 21, 2025). Students stated the same thing, "*Learning doesn't feel boring because there are always things to do together*" (SSMP2-26, interview September 21, 2025). Another student added, "*If our group succeeds in completing the mission, we feel satisfied because it is the result of joint efforts*" (SSMP3-29, interview September 22, 2025).

The incorporation of all engagement dimensions shows a significant overall improvement.

Table 5. Overall Engagement Score Comparison

Dimension	Pre-Mean	Post-Mean	Difference	t-value	Itself.
Cognitive	2.81	3.85	1.04	13.772	0.000
Affective	2.74	3.68	0.94	11.599	0.000
Behavioral	2.69	3.74	1.05	12.884	0.000

Overall, the model is able to increase engagement across all dimensions with substantive and statistically significant changes.

DISCUSSION

The study found that prior to the intervention, student engagement both cognitive, affective, and behavioral was still at a low level, as shown by the consistency between qualitative data and pre-intervention scores. This condition reinforces the assumption that classes that are still dominated by conventional methods tend to give birth to passive participation and minimal initiative. From a motivation theory perspective, the pre-intervention findings are aligned with the framework of self-determination theory which emphasizes that without meeting the needs for autonomy, competence, and connectedness, intrinsic motivation is difficult to develop (Ryan & Deci, 2020). Thus, pedagogical interventions that explicitly target these three needs become a logical basis for designing strategies to increase active participation, as well as a strong theoretical basis for the application of gamified sociocollaborative learning models.

The results show that gamification elements such as points, badges, and challenges quickly increase students' affective motivation. This is reflected in the increase in post-intervention motivation scores and recognition from students and teachers. Significant quantitative analysis confirms that these changes are not accidental, but rather a response to game features that deliver an experience of achievement and immediate feedback. These findings are consistent with previous meta-analyses that stated that gamification is effective in increasing motivation and engagement when designed to support the psychological needs of learners (Li et al., 2023). However, the effectiveness of gamification is heavily influenced by its design: elements that are purely extrinsic tend to have temporary effects, so a design that supports autonomy and relevance of learning is needed.

The implementation of group missions and cooperative challenges has also been proven to strengthen students' social interaction and collaboration, as seen from observation data and collaborative score improvement. Theoretically, this reinforcement is in line with the view of social constructivism which asserts that learning is formed through interaction between individuals. When students are given collective goals and group-based rewards, they are encouraged to explain to each other, discuss strategies, and correct each other's understandings. This is in line with the findings of longitudinal studies that show that team-based gamification is able to maintain engagement better than individual competition

because it strengthens a sense of social connectedness (Rodrigues et al., 2022). Therefore, the results of this study confirm that gamification integrated with collaborative activities not only increases activeness, but also the quality of academic interaction.

Regression analysis showed that 62% of cognitive engagement variations could be explained by a combination of gamification elements and collaborative activities, confirming the significant role of both to students' cognitive processes. These findings indicate that gamified tasks that demand problem-solving and provide direct feedback are able to drive metacognitive strategies, such as answer revision and reflection, which are indicators of high-level cognitive engagement. The alignment of these findings with previous evidence synthesis reinforces that gamification has a positive impact on cognitive aspects when the challenges given are relevant to the learning objectives (Diaz, 2024). Thus, the benefits of gamification are not only superficial, but can encourage critical thinking and deeper conceptual understanding.

Although the results of the study showed a positive impact, a number of moderating factors need to be considered. First, the novelty effect or initial increase due to novelty factors can affect the magnitude of the gamification effect, as shown in long-term studies; therefore, design variation and adaptation phases are necessary for motivation to remain stable (Ratinho et al., 2023). Second, the heterogeneity of students' abilities can affect the distribution of benefits, as unbalanced groups are prone to dominance by higher-capable students. Third, the readiness of teachers in implementing new learning models also determines the success of implementation. Adequate training has been proven to improve the consistency and quality of implementation. Understanding these factors is important to explain the variation between classes and provide direction for model development.

Some methodological weaknesses also need to be noted. The quantitative sample size (n = 72) is sufficient for simple regression analysis, but it is still limited for broader generalizations. The relatively short duration of the intervention has not allowed an assessment of the sustainability of the long-term effects. In addition, the use of self-report instruments has the potential to give rise to social response bias. Although the sequential explanatory design provides depth of analysis, the number of qualitative informants of only six may not fully represent the diversity of teacher and student experiences. Follow-up research is recommended to use controlled experimental designs, extend the duration of interventions, involve more diverse locations, and utilize learning analytics as objective measurements.

The theoretical contribution of this research lies in the integration of gamification and sociocollaborative learning as a mechanism that is able to meet the main needs in self-determination theory (SDT) of competence, autonomy, and connectedness, while increasing deep cognitive engagement. It expands the theoretical understanding of engagement through comprehensive empirical evidence. Practically, this study offers a learning design guide that emphasizes game elements that encourage team collaboration, relevant challenges, direct feedback, as well as the role of teachers as trained facilitators. Thus, this model

can serve as a reference for schools and policymakers to develop adaptive and responsive learning strategies, as well as easily transfer to other junior high school contexts with adjustments to student resources and characteristics.

CONCLUSION AND RECOMMENDATION

This study confirms that student involvement in the context of junior high school, especially grades VII–VIII, can be significantly improved through the integration of gamified sociocollaborative learning. Prior to the intervention, students showed a low level of engagement due to the dominance of conventional methods that lacked room for autonomy, interaction, and meaningful learning experiences. Interventions that combine elements of gamification of points, badges, group challenges, and direct feedback with collaborative activities have been shown to consistently improve students' affective motivation, behavioral participation, and cognitive processing. Both qualitative and quantitative findings show that cooperative challenge-based learning designs and collective goals are able to strengthen social relationships between students and encourage them to engage on a deeper level.

Theoretically, this study reinforces the understanding that meeting basic psychological needs as described in the framework of self-determination theory is the key to increased engagement, and the integration of gamification with collaborative learning is an effective strategy to achieve this. In practical terms, this model provides a new direction for the development of learning strategies that are more interactive, adaptive, and relevant to the characteristics of early adolescents in the future educational era. Despite showing positive results, the study still acknowledges limitations related to sample size, duration of intervention, and potential response bias. Therefore, follow-up studies are recommended using a long-term, multi-site, and more objective measurement approach to strengthen the generalization of findings and expand the contribution of gamified sociocollaborative learning models in educational practice.

ADVANCED RESEARCH

Future studies are recommended to implement gamified sociocollaborative learning across a wider range of schools and over longer periods to examine its long-term impact on student engagement and learning outcomes. Further research should also use more objective measurement tools and explore variations of gamification elements to identify the most effective designs for different student characteristics and subjects.

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