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Improving Elementary Students' Motivation and IPAS Learning Outcomes through a Wordwall-Based Team Games Tournament Model

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ABSTRACT

Conventional IPAS learning often yields low motivation and poor outcomes due to passive methods, while integrating digital games with cooperative models remains underexplored. This study aims to describe the implementation of the Wordwall-assisted Team Games Tournament (TGT) model and to determine improvements in motivation and IPAS learning outcomes among fifth-grade students. Employing Classroom Action Research with qualitative and quantitative descriptive data, the study involved 22 students over two cycles. Data were collected through observation, testing, and documentation. The success criteria were set at a minimum 61% class motivation and 80% classical mastery. The results indicate that: (1) the TGT-Wordwall model created active and interactive learning through digital tournaments; (2) learning motivation increased from 40% (pre-cycle) to 49% (Cycle I) and 72% (Cycle II); and (3) average learning outcomes rose from 65.27 to 70.18 and 79.09, with classical mastery reaching 41%, 64%, and 86%, respectively, exceeding the 80% target. The findings indicate that the Wordwall-assisted Team Games Tournament model can support improvements in students' motivation and IPAS learning outcomes. The integration effectively transforms passive classrooms into active, collaborative environments. This provides a practical, technology-enhanced framework for elementary educators to boost both affective and cognitive domains in learning.

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1. INTRODUCTION

Education is a fundamental human initiative aimed at fostering physical and spiritual qualities, enabling individuals to develop their potential and adapt to scientific and technological advancements [1]. To achieve this, teacher professionalism is crucial, particularly in lesson planning and the proficient use of instructional technologies. Teachers

play a dominant role in managing the classroom and creating an engaging communicative atmosphere. Consequently, effective instructional media are essential for conveying messages, promoting data interpretation, and increasing student motivation and interest [2], [3], [4], [5], [6]. Various innovative media, from audio-visual tools to digital platforms, have been proven to enhance learning effectiveness across different subjects [2], [4], [6], [7], [8].

In elementary schools, the learning process lays the foundation for students' knowledge. One crucial subject is Natural and Social Sciences, known in Indonesia as IPAS (Ilmu Pengetahuan Alam dan Sosial). For international readers, IPAS is an integrated subject in the Indonesian Merdeka Curriculum that combines basic concepts of natural sciences and social studies, allowing young learners to understand their natural and social environment holistically [9], [10], [11]. Despite its importance, preliminary observations in Class 5A at SDN 04 Madiun Lor revealed that IPAS instruction is not yet fully optimized. The learning process is still dominated by conventional lecture and question-and-answer methods, resulting in low student engagement. Only a small number of students actively participate, while the majority listen passively without enthusiasm. Interviews with the teacher indicated that only around 40% of students showed interest in IPAS. Consequently, the average score on daily summative assessments in the previous semester remained below the Learning Objective Achievement Criteria (LOAC) of 75; out of 22 students, only 9 achieved passing scores. This issue is exacerbated by the limited variety of learning media, with teachers heavily relying on textbooks and blackboards.

Student motivation is a critical factor driving learning success, encompassing both internal and external forces that encourage students to engage in the learning process [12], [13], [14]. The low motivation and poor learning outcomes in Class 5A highlight the urgent need for interactive and engaging instructional strategies. Recent technological developments offer various interactive media that can improve the relevance and interest of educational experiences. One promising tool is Wordwall, a user-friendly digital platform offering educational games such as quizzes, puzzles, and matching activities tailored to specific lesson content [7], [15]. By allowing students to learn while playing, Wordwall creates an enjoyable environment that reduces monotony and has been shown to boost both motivation and conceptual understanding across various subjects [4], [6], [8], [16], [17]. Furthermore, the integration of gamification and digital challenges has been widely recognized for its positive impact on academic achievement and student flow [5], [18], [19].

However, using interactive media like Wordwall alone is insufficient without an appropriate instructional model to structure the collaboration. The Team Games Tournament (TGT) is a cooperative learning model highly recommended for enhancing motivation and learning outcomes. TGT utilizes academic games and intellectual challenges, dividing students into heterogeneous teams to work together, complete assignments, and compete in tournaments [20], [21], [22]. This model encourages healthy competition, shared responsibility, and active involvement, which are essential for IPAS education [9], [20], [21], [22], [23]. Previous studies confirm that TGT significantly improves student engagement, academic achievement, and social skills [9], [21], [22], [24], [25]. By combining Wordwall's digital interactivity with TGT's collaborative structure, students are

inspired to engage, compete, and build strong peer relationships, while teachers act as facilitators.

Although previous studies have extensively explored the individual effectiveness of Wordwall and the TGT model, there is a distinct lack of research addressing their integration specifically in fifth-grade IPAS learning. Most prior studies utilized Wordwall as an individual evaluation tool [4], [6], [7], [16] or implemented TGT using conventional, paper-based games [9], [21], [22]. Furthermore, existing research combining Wordwall and TGT is predominantly limited to mathematics [23]. This study explicitly addresses this gap by integrating the Wordwall platform within the TGT model specifically for fifth-grade IPAS at SDN 04 Madiun Lor. Therefore, this study aims to improve elementary students' motivation and IPAS learning outcomes through a Wordwall-Based Team Games Tournament model. By employing Classroom Action Research (PTK) methodology, this study systematically addresses the learning challenges through planned cycles of action, observation, and reflection [26], ultimately providing a novel, technology-integrated cooperative learning strategy for IPAS education.

2. METHOD

This study employed Classroom Action Research (CAR), a highly appropriate design as it aims to improve classroom practice and solve specific learning problems through iterative cycles of planning, acting, observing, and reflecting [26]. The research was conducted at SDN 04 Madiun Lor, located at Jalan Sumatra No. 15, Madiun Lor Village, Manguharjo Subdistrict, Madiun City, East Java. The participants were 22 fifth-grade students in Class 5A, consisting of 11 boys and 11 girls. The study took place over two cycles in April 2026, following the four stages of the Kemmis and McTaggart model to ensure continuous improvement based on reflective evaluations of each action.

The procedure in each cycle consisted of two sessions totaling six class hours, implementing the Wordwall-assisted Team Games Tournament (TGT) model. The learning steps included introductory activities such as mindful learning, presentation of learning objectives, and apperception; core activities consisting of material explanation, heterogeneous group division, group discussion, and an interactive quiz tournament via the Wordwall platform utilizing features like game show quiz, open the box, quiz, and anagram; and closing activities comprising reflection, material summary, post-test, and closing prayer. Each cycle focused on specific IPAS topics. Cycle I covered the geographical and astronomical conditions of Indonesia, their impact on the community's socio-economic life, and Indonesia's climate. Cycle II focused on the biodiversity of Indonesia, highlighting the differences in flora and fauna across western, central, and eastern Indonesia.

The transition between cycles was driven by rigorous reflection. During Cycle I, the reflection stage revealed that some students were still confused by the technical mechanics of the Wordwall application, and the tournament's time allocation was too short, leading to rushed group discussions. Based on these findings, several improvements were implemented in Cycle II. The teacher provided clearer technical instructions and a brief demonstration for using Wordwall, extended the tournament duration, and increased direct guidance during

heterogeneous group discussions to ensure all students were actively engaged and technically prepared.

Data were collected using three main instruments to ensure a comprehensive evaluation. First, a motivation observation sheet was used to assess students' learning motivation using five specific indicators: interest in learning activities, enjoyment of independent work, persistence, defending one's opinions, and enjoyment of problem-seeking and problem-solving [12]. This observation sheet utilized a 5-point Likert scale ranging from 1 (very low) to 5 (very high). The motivation percentage was calculated using the formula P = (F / N) x 100%, where P is the percentage, F is the total frequency of observed scores, and N is the maximum ideal score. Second, a learning outcome test consisting of 25 multiple-choice questions was administered at the end of each cycle. Prior to the actual study, the test instrument was rigorously tested, confirming acceptable item validity (r-count > 0.30), high reliability (Cronbach's alpha > 0.70), moderate difficulty levels (ranging from 0.30 to 0.70), and good discrimination indices (> 0.30). Third, documentation in the form of activity photos and learning records was gathered to support the qualitative data.

To ensure objectivity and systematic evaluation, data were analyzed using descriptive quantitative techniques with clear collaborative observation. The researcher acted as the practitioner implementing the action, while a colleague teacher served as an independent observer to record student motivation and teacher activity without bias. The success of the research was determined by three systematic criteria: a minimum motivation criterion where the average class motivation percentage must reach at least 61% (high category); a minimum individual Learning Objective Achievement Criteria (LOAC) score of 75 for each student; and a minimum classical mastery percentage requiring at least 80% of the total students in the class to achieve or exceed the individual LOAC score.

Prior to the study, strict ethical guidelines were in place to protect all participants. Formal permission and ethical clearance were obtained from the school principal of SDN 04 Madiun Lor. The classroom teacher was actively involved in the collaboration and planning process to ensure the actions were contextually appropriate and beneficial. To protect the participants, student anonymity and data confidentiality were strictly maintained throughout the research process. Furthermore, informed consent was obtained from the students' parents or guardians, ensuring they fully understood the study's purpose, the nature of the intervention, and their right to withdraw at any time without any academic penalty.

3. RESULTS AND DISCUSSION

3.1. Result

3.1.1. The Process of Implementing the Team Games Tournament Learning Model Assisted by the Wordwall Platform

The implementation of the Team Games Tournament (TGT) model, assisted by the Wordwall platform, was conducted over two cycles, each comprising planning, action, observation, and reflection. During the planning phase, teachers developed instructional materials, including lesson plans, Wordwall interactive media, observation sheets, and assessment questions. Wordwall was selected to transform the previously teacher-centered, passive learning environment into an interactive, game-based experience [8]. While previous

studies confirm that interactive digital media and AI-assisted modules can enhance student engagement [10] and that gamification fuels students' desire to succeed [18], the specific process of integrating these tools within the TGT framework required careful orchestration.

In the action phase, students were divided into heterogeneous groups to foster positive interaction and mutual support [11]. Before the tournament, the teacher explained the TGT mechanics and provided a brief tutorial on using Wordwall, aligning with cooperative learning principles that emphasize group problem-solving [3]. The core activities utilized specific Wordwall features tailored to the learning objectives of each cycle. In Cycle I, which covered the geographical and astronomical conditions of Indonesia and their socio-economic and climatic impacts, the "Open the Box" feature was used for exploratory learning of geographical concepts. In contrast, the "Quiz" feature was employed for formative assessment of climate impacts. In Cycle II, focusing on Indonesia's biodiversity and the distribution of flora and fauna across western, central, and eastern regions, the "Game Show Quiz" was used for competitive team reviews, and the "Anagram" feature challenged students to correctly arrange complex biodiversity terms.

Observations during the tournament revealed distinct behavioral differences between cycles. In Cycle I, while the elements of play made students enthusiastic, observational notes indicated that some students were distracted by Wordwall's visual animations, and a few active students often dominated group discussions. The reflection after cycle I indicated that the class did not reach the target because time management during the tournament was poorly executed, and the group roles were not clearly defined, leading to unequal participation. Consequently, specific revisions were made in Cycle II. The teacher assigned specific roles (e.g., leader, timekeeper, encyclopedist) to ensure equal participation, set strict time limits for each Wordwall game, and provided clearer scaffolding during the "Anagram" and "Game Show Quiz" sessions. As a result, in Cycle II, observational evidence showed that students actively debated answers before submitting them in the tournament, confidently voiced their ideas, and supported peers who struggled, demonstrating a more focused and collaborative learning process [4], [19]. This structured integration proves that when digital tools are systematically embedded in cooperative models, they effectively shift students from passive listeners to active, independent learners [5], [9], [21].

3.1.2. Improvement in Student Learning Motivation

Student learning motivation was observed using a sheet based on five indicators: interest in learning activities, enjoyment of independent work, persistence, defending one's opinions, and enjoyment of problem-solving. The observations clearly show a progressive improvement across the cycles. During the pre-cycle, the overall percentage of student learning motivation was only 40%, placing it in the low category. Observational notes indicated that students appeared passive, easily bored, and reluctant to express their ideas, a condition caused by conventional lecture methods. Fourteen students (64%) were categorized as low, while eight students (36%) were in the moderate category.

When the Wordwall-supported TGT model was implemented in Cycle I, the proportion of students with moderate to high motivation rose to 49%. This 9% increase was evident in their growing engagement during group discussions and their initial excitement

during the Wordwall tournament. However, observational evidence showed that six students (27%) remained in the low category because they were not yet accustomed to the tournament mechanism and felt pressured by the time limits, which slightly hindered their persistence and confidence in defending their opinions.

In Cycle II, following the revisions in group roles and time management, students' motivation increased significantly to 72%, placing it in the high category. This represents a 23% increase from Cycle I and a 32% increase from the pre-cycle. A total of 14 students (64%) reached the high category, and 4 students (18%) reached the very high category. Observational data confirmed this quantitative shift: students were highly focused, actively defended their opinions during the "Game Show Quiz" debates, and showed great enjoyment in solving the "Anagram" puzzles. They had become accustomed to the collaborative tournament environment, which fostered a supportive rather than purely competitive atmosphere. This progressive behavioral change aligns with previous findings that Wordwall increases student motivation and learning results [5] and supports the notion that digital game-based learning, when properly scaffolded, effectively boosts intrinsic motivation and sustained engagement in elementary science and social studies classes [12], [15].

Table 1. Summary of Improvements in Student Learning Motivation

Cycle	Motivation (%)	Category
Pre-cycle	40%	Low
Cycle I	49%	Moderate
Cycle II	72%	High

Source: Primary Research Data (2026)

3.1.3. Improvement in Student Learning Outcomes

Student learning outcomes were measured using a 25-item multiple-choice test at the end of each cycle, with a minimum Learning Objective Achievement Criteria (LOAC) score of 75. The results demonstrate a clear upward trend in both average scores and classical mastery. In the pre-cycle, the average score was 65.27 with a classical mastery of only 41% (9 out of 22 students meeting the LOAC). The highest score was 94, and the lowest was 40, indicating that conventional instruction failed to optimize student achievement.

In Cycle I, the average score improved to 70.18, and classical mastery increased to 64% (14 students meeting the LOAC). Although this was a 23% improvement from the pre-cycle, it did not meet the 80% classical mastery target. The reflection revealed that, while students enjoyed the games, their conceptual understanding of complex IPAS materials, particularly the socio-economic impacts of geographical conditions, remained shallow. The rapid pace of the Wordwall tournament left some students guessing rather than deeply analyzing the answers. To address this, Cycle II incorporated more structured peer tutoring within the TGT framework, encouraging high-achieving students to explain concepts to peers before the tournament began.

Consequently, in Cycle II, student learning outcomes showed a more significant improvement, reaching an average score of 79.09 and a classical mastery of 86% (19 out of 22 students meeting the LOAC). This 22% increase from cycle I successfully exceeded the established success indicator. The detailed reflection showed that the combination of peer

tutoring and targeted Wordwall features, such as the "Anagram" for reinforcing biodiversity terminology, helped solidify students' conceptual understanding. The majority of students not only achieved scores above the LOAC but also demonstrated better analytical skills in answering higher-order thinking questions. This confirms that the systematic integration of the Wordwall platform within the TGT model effectively enhances both the process and the final outcomes of IPAS learning, transforming initial low achievement into optimal classical mastery.

Table 2. Summary of Improvements in Student Learning Outcomes

Cycle	Average Score	Classical mastery (%)
Pre-cycle	65.27	41%
Cycle I	70.18	64%
Cycle II	79.09	86%

Source: Primary Research Data (2026)

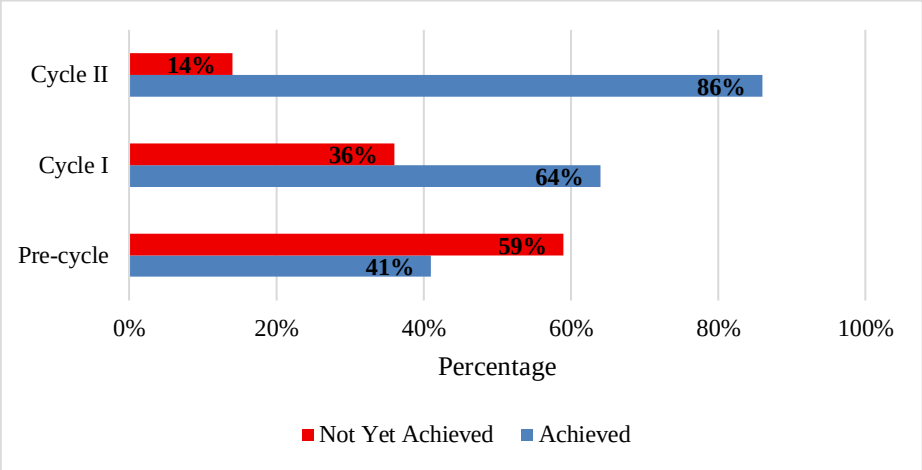

Figure 1. Diagram of Student Learning Achievement

3.2. Discussion

The implementation of the Wordwall-assisted Team Games Tournament (TGT) model significantly improved student motivation, demonstrating the core principle of Classroom Action Research (CAR) where reflection directly drives instructional refinement. In the pre-cycle, motivation was low (40%) due to passive, teacher-centered learning. In Cycle I, motivation increased to a moderate 49%, but reflection revealed that some students remained disengaged due to technical confusion with Wordwall and unclear group dynamics. Analytically, the significant jump to 72% (high category) in Cycle II was directly caused by the targeted revisions made during the reflection phase. By providing clearer technical instructions, assigning specific roles within heterogeneous groups, and managing tournament time more strictly, the teacher reduced student anxiety and fostered a more structured collaborative environment. This iterative CAR process proves that motivation is not just sparked by the novelty of digital games, but is sustained when the instructional design is continuously refined to meet students' actual needs.

The analytical drivers behind this motivational increase lie in the strategic integration of gamification and cooperative structures. The TGT model, supported by Wordwall, introduced game elements such as points, scoring systems, group rewards, and healthy

competition. These elements act as powerful external stimuli that fulfill students' psychological needs for achievement and active engagement [18]. When students compete in tournaments, the scoring system and group rewards create a sense of shared responsibility, pushing them to master the material not just for themselves, but for their team. This aligns with the concept that learning motivation comprises both internal drives and external directions that inspire passion and guide activities toward desired goals [3]. Furthermore, the observable traits of motivation, such as enthusiasm in learning activities, persistence in independent work, the courage to defend opinions, and enjoyment in problem-solving[10] were highly visible during the tournaments. The digital platform transformed abstract IPAS concepts into interactive challenges, making the classroom atmosphere lively and significantly reducing the boredom typically associated with conventional lectures.

Beyond motivation, the integration of digital media and cooperative learning directly translated into improved cognitive and affective learning outcomes. The improvement in test scores occurred because the TGT model shifted students from passive recipients of information into active problem solvers. Through group discussions and academic tournaments, students collaboratively constructed their understanding of complex IPAS topics, such as Indonesia's geographical impacts and biodiversity. This active engagement is crucial, as learning outcomes are fundamentally influenced by a combination of internal factors (motivation, interest) and external factors (instructional methods, media, environment) [14]. The structured collaboration in TGT ensures that cognitive, emotional, and psychomotor skills are developed simultaneously after the learning process [25]. The findings corroborate previous assertions that the TGT paradigm significantly enhances both learning outcomes and motivation by making the learning process highly interactive and student-centered [21].

The specific features of Wordwall played a critical role in deepening conceptual understanding, thereby directly impacting learning outcomes. For instance, using the "Anagram" feature in Cycle II required students to actively recall and arrange complex biodiversity terminology, reinforcing their cognitive retention. This demonstrates that interactive digital tools do not merely entertain; they enhance conceptual comprehension and learning motivation by providing immediate feedback and interactive exercises [17]. The integration of such digital game media is an efficient strategy to enhance learning quality across various subjects, similar to how digital games improve social dynamics and learning outcomes in other contexts [5]. Furthermore, the flexibility and customization of platforms like Wordwall allow teachers to tailor the difficulty and content to specific learning objectives, grabbing students' attention and motivating them to think more accurately and creatively [6]. The effectiveness of combining Wordwall with TGT is also supported by studies showing high enthusiasm and positive learning benefits when educational game platforms are used in cooperative models [23]. Additionally, the cognitive demands of solving game-based problems align with challenging teaching strategies that increase intrinsic motivation and analytical thinking [24], and they also reflect the broader success of active problem-solving models in IPAS education [11]. The significance of incorporating interactive technology is further bolstered by data showing that students' conceptual understanding can be enhanced through interactive use of advanced digital learning media

[10], and the overall effectiveness of the TGT model in significantly increasing academic attainment from pretest to post-test further validates this approach [22].

Despite the overall success, it is important to analytically address why three students (14%) still did not reach the minimum LOAC score of 75 in Cycle II. Observations and reflections indicated that these students struggled with the abstract, highly conceptual nature of certain IPAS topics, particularly the astronomical conditions and specific classifications of flora and fauna. Despite peer tutoring, their individual learning pace and occasional lack of focus during independent study limited their conceptual mastery. Furthermore, implementing this digital cooperative model posed several practical challenges. Time management during the tournament phases was initially difficult, often requiring extensions that compressed the closing reflection sessions. Classroom noise levels spiked significantly during the "Game Show Quiz" due to students' excitement, which occasionally distracted those who needed a quieter environment to concentrate. Additionally, while students quickly adapted to Wordwall, initial unfamiliarity with the platform's interface in cycle I consumed valuable instructional time, and minor fluctuations in internet connectivity occasionally disrupted the smooth flow of the live tournaments. Nevertheless, the TGT model successfully fostered basic skills, positive peer relationships, self-esteem, and an attitude of acceptance toward differences, as students learned to support their struggling peers rather than blame them [20].

Finally, several limitations of this study must be acknowledged. First, the research was conducted with a small sample of 22 students, limiting the generalizability of the findings to larger or more diverse student populations. Second, the study was confined to a single classroom context (Class 5A at SDN 04 Madiun Lor), limiting the results to the unique socio-cultural and academic dynamics of that particular school. Third, the intervention period was relatively short, spanning only two cycles in April 2026, which does not allow for the observation of long-term retention of the learning outcomes or sustained motivation. Lastly, the absence of a control or comparison group means the improvements cannot be attributed exclusively to the Wordwall-assisted TGT model, as these effects may be confounded with maturation or testing effects. Future research should address these limitations by employing larger, multi-school samples, extending the intervention over a full semester, and using quasi-experimental designs with control groups to validate the model's efficacy further.

4. CONCLUSION

The implementation of the Wordwall-assisted Team Games Tournament model improved students' motivation and IPAS learning outcomes across two classroom action research cycles. Specifically, student learning motivation increased from 40% in the pre-cycle to 49% in Cycle I and ultimately reached 72% (high category) in Cycle II. Similarly, classical mastery in learning outcomes rose from 41% in the pre-cycle to 64% in Cycle I and surpassed the 80% target, reaching 86% in Cycle II. Through interactive educational games and academic tournaments, the learning environment became an active, enjoyable space that fostered optimal student engagement. Theoretically, this study reinforces the principles of interactive and collaborative learning by integrating digital gamification with cooperative

structures. In practice, the model has proven effective in creating meaningful learning experiences, boosting students' self-confidence, and fostering peer collaboration.

Based on these findings, several concrete recommendations are proposed for educational stakeholders. Teachers are advised to design Wordwall quizzes that are closely aligned with specific learning objectives, manage tournament time efficiently to prevent rushed discussions, and provide targeted support and peer tutoring for students who still struggle with complex concepts. Additionally, teachers must prepare stable internet access and ensure device readiness prior to the lesson to avoid technical disruptions. Schools should support this digital transition by providing adequate technological infrastructure and continuous professional training on interactive platforms. Students are encouraged to remain actively engaged and take responsibility for their collaborative roles within their groups.

Despite its contributions, this study has certain limitations. The research was conducted with a relatively small sample size of 22 students in a single elementary school and was limited to specific IPAS topics over a short duration of two cycles, which may constrain the generalizability of the findings to broader contexts. Therefore, it is recommended that future researchers conduct similar studies with larger, more diverse sample sizes across multiple schools. Further investigations could also explore the application of the Wordwall-assisted TGT model in other subjects, such as mathematics or languages, and examine its long-term impact on higher-order thinking skills, creativity, and student collaboration.

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