

Teams Game Tournament Learning Model to Improve the Science Learning Outcomes of Class V of MIN 1 Lubuk Linggau

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Abstract

This research is a quantitative research. This type of research is experimental research with a quasi-experimental research method. The purpose of this study is to determine whether the use of the *Teams Games Tournament* (TGT) learning model based on *Interactive Wordwall Games* can significantly improve the learning outcomes of fifth grade science students. This type of research is experimental research with a quasi-experimental research method conducted without a comparison class. The results of the research show that there is an increase in students' science learning outcomes after the application of the TGT model based on the wordwall. This is indicated by the *pre-test results* of 3.45% with 1 student who completed and the *post-test value* of 93.10% with 27 students who completed out of 29 students. The data analysis technique used is the z-test at a significance level of 0.05, so that the calculated $Z = 6.40$ and $Z_{table} = 1.64$ ($\text{calculated } Z \geq Z_{table}$). Based on the results of the data analysis conducted, it can be concluded that the results of learning science in grade V students based on interactive wordwall games have significantly achieved the criteria for achieving learning objectives.

Keywords

Christian Religio Learning Outcomes, Science, TGT, Wordwall.



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INTRODUCTION

Education is a vital component in national development, contributing to the production of quality human resources (Rohani et al., 2024; Ubabuddin, 2019). Within the context of the Independent Curriculum, Natural and Social Sciences (IPAS) learning integrates science and social sciences to develop holistic understanding and critical thinking skills in elementary school students (Suhelayanti et al., 2023; Sulistyaningrum et al., 2024; Putri et al., 2025). However, on the ground, the implementation of IPAS learning often faces various instrumental and operational challenges. Learning model TGT is a cooperative learning paradigm where each group representative participates in academic tournaments and quizzes to improve academic abilities (Rezeki, et al., 2024). Wordwall is an online-based application that can support teachers in designing the learning process and making subject matter more interesting and interactive for students. The TGT model combined with Wordwall media can be a good solution to this problem because it offers a more interesting

and interactive learning method (Marwiguna et al., 2024). This means that the combination of the TGT model with Wordwall media is an innovative strategy to address the problem of low student learning outcomes. This method encourages students to learn through play, compete healthily, and work together in teams, thereby improving their understanding of what they are doing.

Based on the results of initial observations and interviews conducted on March 2–7, 2026 in class V Digital MIN 1 Lubuk Linggau, it was identified that student learning outcomes in the subject of science were still relatively low. The results of the mid-semester exam showed that out of 29 students, only 14 students (48.27%) managed to achieve the Learning Objective Achievement Criteria (KKTP) of 75, while the remaining 15 students (51.73%) had not completed it. The main problems underlying this condition were the dominant use of conventional learning methods (such as one-way lectures) and the minimal variety of use of digital facilities available in the classroom, resulting in students feeling bored, less enthusiastic, and tending to be passive (Rahmani & Abduh, 2022).

To overcome these problems, dynamic cooperative learning innovations that utilize interactive technology are needed. One effective approach is the combination of the *Teams Games Tournament* (TGT) model and the interactive game media Wordwall (Marwiguna et al., 2024; Nurani et al., 2025; Rahmi et al., 2025). The TGT model allows students to learn in heterogeneous groups, assist each other as peer tutors, and compete healthily through academic tournaments (Shoimin, 2014; Rezeki et al., 2024). The integration of Wordwall media strengthens the appeal of TGT by presenting real-time visualizations of educational games that are relevant to the characteristics of digital classrooms (Nurulhuda et al., 2024; Saputra, 2025). This study aims to empirically test whether the implementation of the *Teams Games Tournament* (TGT) learning model based on the interactive game Wordwall can significantly improve the science learning outcomes of fifth-grade students of Digital MIN 1 Lubuk Linggau.

METHODS

This study uses a quantitative approach with a *quasi-experimental design* in the form of a *One-Group Pretest-Posttest Design*, this type of research does not require a control class as a differentiator, and only uses one group, namely the experimental class which is the class that receives *treatment*. (Andriany et al., 2022). The study was conducted in class V Digital MIN 1 Lubuk Linggau in the even semester of the 2025/2026 academic year with the number of populations and samples focused on all students of class V Digital MIN 1 Lubuk Linggau, totaling 29 students (17 boys and 12 girls). Sample determination was carried out using a *saturated sampling technique*, where all members of the population were used as experimental samples without a control/comparison class (Suryani et al., 2023).

Data collection techniques are the methods used by researchers to obtain information or research data, and are also a very strategic step in research methodology (Daruhadi, et al

2014). The main data collection technique used in this study is a multiple-choice objective test of 15 questions that have been declared valid ($r_{pbis} > r_{tabel} = 0,404$) and have very high reliability ($r_{11} = 0,81$ using the KR-20 formula). In addition to test data (*pre-test* and *post-test*), supporting data collection is carried out through observation of learning activities, interviews with class teachers and students, and documentation. (Magdalena et al., 2021) *pre-test* is a research instrument given before the delivery of learning materials, while *the post-test* is a research instrument given after the delivery of the material which aims to determine the extent of students' understanding of the learning materials to be studied. Interviews are a method used to collect data through direct questions and answers between researchers as interviewers and research respondents as interviewees with predetermined topics with the aim of carrying out initial research and finding problems to be studied, (Soesana et al., 2023). Observation is a data collection technique that involves direct observation of participants and the context involved in the research phenomenon (Ardiansyah et al., 2023). Documentation is a method used to search for data or documents used by researchers. Documents can be notes, reports, letters, books, or other official documents (Saadi, 2025).

FINDINGS AND DISCUSSION

Validity Test

Soesana et al. (2023:74) explain that if an item has only a score of 1 or 0, the Biserial Correlation Coefficient formula can be used. The following is the Biserial Correlation Coefficient formula according to Arikunto (Soesana et al. 2023):

$$r_{pbis} = \frac{Mp - Mt}{St} \sqrt{\frac{p}{q}} \text{ (Arikunto, 2023)}$$

Information:

r_{pbis} : Point biserial correlation coefficient

Mp : average score of correct answers

Mt : Mean total score (average score of all test takers)

St : standard deviation of total score

p : Proportion of subjects who answered the item correctly

q : Proportion of subjects who answered the item incorrectly

Table 1. Validity Correlation Index Criteria

Correlation Range	Criteria
$r_{pbis} \leq 0.00$	Invalid
$0.00 \leq r_{pbis} < 0.20$	Very Low
$0.20 \leq r_{pbis} < 0.40$	Low Validity
$0.40 \leq r_{pbis} < 0.60$	Moderate Validity
$0.60 \leq r_{pbis} < 0.80$	High validity
$0.80 \leq r_{pbis} < 1.00$	Very high validity

Based on the statement above, the testing criteria are if *the calculated $r \geq r_{table}$* then it can be

said that the data obtained is valid, whereas if $r_{\text{calculated}} \leq r_{\text{table}}$ then the data obtained is invalid.

Reliability Test

According to reliability, an instrument is sufficiently trustworthy to be used as a data collection tool, because the instrument is already good (Arikunto, 2020). (Arikunto, 2020) also argues that if using a test instrument in the form of multiple-choice questions, the formula used in determining the instrument's reliability is KR-20, namely:

$$r_{11} = \left(\frac{k}{k-1} \right) \left(\frac{V_t - \sum pq}{V_t} \right) \text{ (Arikunto, 2013)}$$

Information:

r_{11} : Instrument Reliability

k : Number of questions

V_t : Total variance

p : The proportion of subjects who answered a question correctly

q : Proportion of subjects who answered incorrectly on a question item.

Table 2 Reliability Criteria

Interpretation of Values	Criteria
$r_{11} \leq 0.20$	Very Low
$0.21 < r_{11} \leq 0.40$	Low
$0.41 < r_{11} \leq 0.60$	Currently
$0.61 < r_{11} \leq 0.80$	Tall
$0.81 < r_{11} \leq 1.00$	Very high

Based on the results of the instrument test data analysis using the KR-20 formula, a reliability coefficient of 0.81 was obtained, meaning the question has a very high degree of reliability, so it can be trusted as a measuring tool.

Normality Test

The normality test is used to determine whether the sample in the study is normally distributed or not (Hakimah et al. 2017). The normality test in this study uses the chi-square formula which aims to test the suitability of the data in a normal distribution.

$$\chi^2 = \sum_{i=1}^k \frac{(f_o - f_h)^2}{f_h} \text{ (Arikunto, 2013)}$$

Information:

χ^2 : Chi square

f_o : Observed frequency

f_h : Expected frequency

The test criteria are: if $\chi^2_{\text{the count}} < \chi^2_{\text{the table}}$, the data can be declared normally distributed. Conversely, if $\chi^2_{\text{the count}} > \chi^2_{\text{the table}}$, the data is declared abnormally distributed.

The results of the data normality test indicate that *the pre-test* and *post-test* data are normally distributed ($\chi^2_{hitung} < \chi^2_{tabel}$) at a significance level of 0.05. This can be seen in the following table:

Table 6. Normality Test Recapitulation

Normality Test	χ^2_{count}	Dk	χ^2_{table}	Conclusion
<i>Post-test</i>	8.11	6	11.07	Normal
<i>Pre-test</i>	9.26	6	11.07	Normal

Hypothesis Testing

testing is carried out using the Z-Test. Based on quantitative statistical calculations, the values $Z_{hitung} = 6,40$ and are obtained $Z_{tabel} = 1,64$. Because $Z_{hitung} \geq Z_{tabel}$ ($6,40 \geq 1,64$), the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted.

Table 7 Post-test hypothesis test results

Data	Z_{count}	Z_{table}	Conclusion
<i>Post-test</i>	6.40	1.64	$Z_{count} > Z_{table}$, H_a is accepted

Based on the table above, it can be concluded that $Z_{count} \geq Z_{table}$. This means that after implementing the TGT learning model based on interactive wordwall games, the science learning outcomes of class V students of MIN 1 Lubuk Linggau were significantly able to achieve the learning objectives.

The findings of this study prove that the integration of *the Teams Games Tournament* (TGT) learning model with the interactive game media Wordwall effectively improves science learning outcomes significantly. This success is supported by the TGT syntax structure that combines cooperative learning with fun academic competition (Shoimin, 2014; Rezeki et al., 2024). Students who were previously passive and bored with conventional methods are encouraged to participate actively in heterogeneous groups. Through the presentation phase of the material assisted by the Wordwall visual feature, students' conceptual understanding of the science material (the properties of light) becomes more concrete. In the *Team Study phase*, cooperation between team members functions optimally where high-ability students help their group members who need guidance (peer tutors). The use of the Wordwall platform in the tournament phase also strengthens student learning motivation. The quiz feature, random wheel, and leaderboard *directly* create a healthy competitive atmosphere without intimidating students. The improvement in student learning outcomes in this study is consistent with the results of research by Saputra (2025), Rahmi et al. (2025), and Mukaromah (2025), who also found that the TGT model assisted by interactive Wordwall media was significantly able to boost the completion of science learning outcomes and students' understanding of concepts.

CONCLUSION

Based on the results of the data analysis and discussion, it can be concluded that the implementation of the *Teams Games Tournament* (TGT) learning model supported by the interactive Wordwall game effectively improved the science learning outcomes of fifth-grade students at Digital MIN 1 Lubuk Linggau. The improvement was demonstrated by a substantial increase in students' learning completeness, from only 3.45% in the *pre-test* to 93.10% in the *post-test*. This finding indicates that the combination of cooperative learning through TGT and interactive digital media can create a more engaging, participatory, and enjoyable learning environment. The statistical analysis also indicates a significant difference between students' learning outcomes before and after the implementation of the learning model, supporting the achievement of the Learning Objective Achievement Criteria (KKTP). Therefore, the integration of TGT and Wordwall can be considered an effective and innovative strategy for improving elementary science learning outcomes, particularly in digitally oriented classrooms. Future implementation should consider students' characteristics, technological readiness, and appropriate learning content.

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