

The Influence of Interactive Flat Panel Media and the TGT Model on Students' Collaboration Skills

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Abstract

This study aims to analyze the effect of Interactive Flat Panel (IFP) learning media and the Team Games Tournament (TGT) cooperative learning model on students' collaboration skills at SMPN 9 Satap Maiwa, Enrekang Regency. This study uses a quantitative approach with a quasi-experimental pretest-posttest control group design. The research sample consisted of 33 eighth-grade students consisting of 17 experimental class students and 16 control class students. Data collection techniques included tests, questionnaires, observations, and documentation, with analysis using independent sample t-test, multiple linear regression, and N-Gain. The results showed that IFP media had a positive and significant effect (Sig. 0.028 < 0.05; t count 2.312 > t table 2.042) and the TGT model also had a significant effect (Sig. 0.048 < 0.05; t count 2.061 > t table 2.042). Simultaneously, both variables had a significant effect (Sig. 0.000 < 0.05; F count 74.758 > F table 3.32). The increase in students' collaboration abilities in the experimental class was higher than in the control class, which was proven through the results of the N-Gain analysis which showed a better improvement category in the experimental class, thus strengthening the effectiveness of the application of IFP media and the TGT model in learning.

Keywords

Interactive Flat Panel, Team Games Tournament, Collaboration Capabilities



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INTRODUCTION

The rapid development of science and technology in the era of globalization has significantly transformed various aspects of human life, including education. Educational institutions are now required to continuously innovate in order to produce high-quality human resources who are capable of adapting to complex and dynamic changes. One of the fundamental demands of 21st-century education is the mastery of essential skills commonly known as the 4Cs: critical thinking, creativity, collaboration, and communication. Among these competencies, collaboration skills play a crucial role, as they enable students to work effectively in teams, build mutual

understanding, respect diverse perspectives, and solve problems collectively in both academic and real-world contexts.

Collaboration skills are not merely about working together; they encompass a set of complex social and cognitive abilities, including active participation, effective communication, shared responsibility, and the ability to negotiate and make group decisions. Students who possess strong collaboration skills tend to demonstrate higher engagement, improved problem-solving abilities, and better learning outcomes. However, empirical conditions in schools indicate that students' collaboration skills remain relatively low. This is reflected in the limited interaction among students during group activities, the dominance of certain individuals within groups, and the tendency of many students to work individually rather than collaboratively. This issue is also evident at SMPN 9 Satap Maiwa, Enrekang Regency, where the learning process is still largely dominated by conventional teacher-centered approaches. Such approaches tend to position students as passive recipients of information, thereby limiting opportunities for meaningful interaction, discussion, and cooperative problem-solving. As a result, students are less actively involved in the learning process, and their collaboration skills are not optimally developed.

To address these challenges, it is necessary to implement innovative learning strategies that integrate technology and student-centered learning models. The use of technology-based learning media has become an important solution in enhancing the quality of instruction. One such medium is the Interactive Flat Panel (IFP), which offers various advantages such as interactive displays, multimedia integration, and real-time engagement. The utilization of IFPs can create a more engaging and dynamic learning environment, stimulate students' interest, and facilitate active participation, thereby supporting the development of collaboration skills. In addition to the use of learning media, the selection of an appropriate instructional model is equally important. One of the cooperative learning models that is considered effective in improving students' collaboration skills is the Team Games Tournament (TGT) model. The TGT model integrates group discussions with game-based and competitive elements, which can foster motivation, encourage peer interaction, and promote teamwork. Through structured group activities and tournaments, students are required to collaborate, share knowledge, and take collective responsibility for achieving group success.

Previous studies have demonstrated that both interactive learning media and cooperative learning models independently contribute to improving students'

learning outcomes and social skills. However, studies that examine the combined effect of these two variables—Interactive Flat Panel (IFP) media and the Team Games Tournament (TGT) model—on students' collaboration skills are still limited, particularly at the junior high school level. This gap highlights the need for further investigation to understand how the integration of technology-based media and cooperative learning strategies can synergistically enhance students' collaborative competencies. Therefore, this study aims to analyze the influence of Interactive Flat Panel (IFP) learning media and the Team Games Tournament (TGT) cooperative learning model on students' collaboration skills. This research is expected to contribute both theoretically and practically by providing empirical evidence and innovative learning strategies to improve collaboration skills in the context of 21st-century education.

METHODS

This study used a quantitative approach with a quasi-experimental research type and a pretest-posttest control group design. The study was conducted at SMPN 9 Satap Maiwa, Enrekang Regency. The research sample consisted of 33 eighth-grade students consisting of 17 students in the experimental class and 16 students in the control class. Data collection techniques included tests (pretest and posttest), questionnaires, observation, and documentation. The research instruments were tested for validity and reliability before use. Data analysis was carried out using an independent sample t-test to determine differences between groups, multiple linear regression to determine the effect of independent variables on the dependent variable, and N-Gain analysis to measure the improvement of students' collaboration skills. Data processing was carried out using SPSS software.

FINDINGS AND DISCUSSION

Research result

The results of the study indicate that the use of Interactive Flat Panel (IFP) learning media and the Team Games Tournament (TGT) cooperative learning model has a significant influence on students' collaboration abilities. The analysis was conducted using partial tests (t-test) and simultaneous tests (F-test) to determine the influence of each variable individually or together. Partially, the IFP learning media variable (X1) has a significance value of 0.028 which is smaller than 0.05, and a calculated t value of 2.312 which is greater than the t table of 2.042. This indicates that the use of IFP media has a positive and significant effect on students' collaboration abilities. These findings indicate that technology-based learning media can increase

student involvement in the learning process, thereby encouraging better interaction and cooperation between students.

Furthermore, the TGT learning model variable (X2) also showed a significant influence on students' collaboration abilities. This was evidenced by a significance value of $0.048 < 0.05$ and a calculated t value of $2.061 > t$ table 2.042 . Thus, the TGT learning model was proven effective in improving students' collaboration abilities through structured group work activities, discussions, and academic competitions. Simultaneously, the F test results showed that both independent variables together had a significant influence on students' collaboration abilities. This was indicated by a significance value of $0.000 < 0.05$ and a calculated F value of 74.758 which was much greater than the F table of 3.32 . This high calculated F value indicated that the simultaneous contribution of both variables was very strong in explaining variations in students' collaboration abilities. In addition, the results of the N-Gain analysis showed that the increase in students' collaboration abilities in the experimental class was higher than in the control class. This indicates that the treatment in the form of using IFP media and the TGT model not only has a statistical effect, but also has a real impact in improving students' collaboration skills practically in learning.

DISCUSSION

The findings of this study demonstrate that the use of technology-based learning media, particularly Interactive Flat Panels (IFPs), has a significant positive effect on students' collaboration skills. This result highlights the strategic role of instructional media in facilitating meaningful learning experiences. Learning media not only function as tools for delivering content but also serve as mediators that enhance interaction, engagement, and communication within the classroom. This finding is consistent with Karo and Rohani (2018), who emphasize that learning media improve the effectiveness of communication between teachers and students, thereby fostering a more conducive learning environment. In addition, the integration of technology in learning has been widely recognized as a key factor in increasing student engagement and participation (Nurfadhillah et al., 2021).

In this study, the implementation of IFPs provided an interactive and visually rich learning environment that encouraged students to actively participate in the learning process. Features such as multimedia presentation, real-time interaction, and collaborative display facilitated more dynamic classroom activities. As a result, students were more engaged in discussions, more willing to share ideas, and more actively involved in completing group tasks. This suggests that technology integration in education extends beyond improving cognitive achievement; it also

plays a crucial role in fostering students' social competencies, particularly collaboration skills.

Furthermore, the findings indicate that the Team Games Tournament (TGT) cooperative learning model has a significant positive effect on students' collaboration skills. The TGT model creates a structured learning environment in which students work in heterogeneous groups, engage in discussions, and participate in academic competitions in the form of tournaments. This structure promotes not only individual accountability but also group responsibility. According to Slavin (2015), cooperative learning models such as TGT are specifically designed to enhance social interaction and teamwork through organized group activities. The competitive yet collaborative nature of TGT motivates students to support each other's learning while striving for group success. The results of this study are in line with previous research conducted by Hamdani et al. (2019), Rosyida et al. (2023), and Maesharoh et al. (2024), which consistently report that the TGT model effectively improves students' collaboration skills. Through repeated interactions, shared problem-solving, and collective decision-making processes, students develop essential social skills such as communication, mutual respect, and teamwork.

The improvement in students' collaboration skills in this study is reflected in several key indicators, including the ability to work cooperatively, active participation, respect for others' opinions, and the ability to make group decisions. These indicators are based on the framework of collaboration skills proposed by Greenstein (as cited in Zulfani, 2025). The findings show that students in the experimental group experienced significant improvements across these indicators compared to those in the control group. This indicates that the applied instructional approach not only enhances academic engagement but also contributes to the holistic development of students' social skills. More importantly, the simultaneous implementation of IFP media and the TGT learning model produced more optimal outcomes in improving students' collaboration skills. This finding suggests a synergistic effect between technology integration and cooperative learning strategies. The use of IFP enhances the visual and interactive dimensions of learning, making it more engaging and accessible, while the TGT model strengthens interpersonal interaction and teamwork among students. Together, these approaches create a learning environment that is not only student-centered but also highly interactive and collaborative.

This synergy confirms the findings of Putri and Hidayat (2022) and Riyadi and Ningsih (2025), who argue that the combination of interactive learning media and

cooperative learning models significantly improves both student engagement and learning outcomes. Therefore, this study provides strong empirical evidence that integrating technology-based media with cooperative learning approaches is an effective strategy for enhancing students' collaboration skills. In a broader context, these findings imply that educational innovation in the 21st century should not focus solely on technological advancement, but also on pedagogical strategies that promote active and collaborative learning. The integration of digital media and cooperative learning models represents a promising approach to preparing students with essential skills needed in the modern world, particularly the ability to collaborate effectively in diverse and dynamic environments.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that the Interactive Flat Panel (IFP) learning media has a positive and significant influence on students' collaboration abilities, as evidenced by a significance value below 0.05 and a calculated t value greater than the t table, so this media is effective in increasing interaction and cooperation in the learning process. In addition, the Team Games Tournament (TGT) type cooperative learning model also shows a positive and significant influence on students' collaboration abilities because it is able to encourage active participation, group cooperation, and social interaction between students. Simultaneously, the use of IFP media and the TGT model provides a more optimal positive and significant influence on students' collaboration abilities, which shows that the integration of technology-based media with cooperative learning models is more effective than the application of one separately.

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