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The Effect of Digital Game-Based Learning on Improving Students' Social Skills in the Hybrid Education Era

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ABSTRACT

This study investigates the impact of digital game-based learning on the improvement of students' social skills within the context of hybrid education. A quasi-experimental design was used, involving 60 students from Universitas Pendidikan Nusantara, divided into an experimental group (n = 30) and a control group (n = 30). The experimental group engaged in a 6-week game-based learning intervention using the digital game "EduQuest," while the control group followed traditional face-to-face instruction. Data were collected using a Social Skills Scale (SSS), collaborative observations, and a satisfaction questionnaire. The results show a significant improvement in social skills in the experimental group, particularly in the areas of teamwork, communication, and conflict resolution ($p < 0.01$). In contrast, the control group showed no significant change in their social skills. Additionally, students in the experimental group reported high levels of engagement and satisfaction with the game-based learning approach. This study highlights the potential of digital game-based learning as an effective tool to enhance social skills in hybrid educational settings. The findings suggest that integrating digital games into learning can provide a valuable avenue for fostering collaboration and communication skills among students.

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1. INTRODUCTION

The development of information technology has brought significant changes in education, creating new opportunities to improve the quality of learning. Among the emerging innovations, digital game-based learning has attracted the attention of many educational researchers and practitioners. This approach utilizes game elements, such as challenges, levels and rewards, to increase student motivation, engagement and learning effectiveness. Game-based learning (GBL) has been shown to be effective in a variety of contexts, from improving understanding of complex academic concepts to building non-cognitive skills such as teamwork and social skills [1][2]. Thus, digital games are not only a means of entertainment, but also a potential tool to enrich students' learning experience, including in the development of social skills that are important in interactions between individuals.

Along with the adoption of technology in education, hybrid learning models-which combine face-to-face learning with online learning-are increasingly popular. Hybrid learning offers flexibility in terms of time and place, allowing students to access materials online, while still maintaining in-class interactions [3]. However, this model also presents new challenges, especially in terms of social interaction. Limited interaction in online learning can hinder the development of students' social skills, such as communication, collaboration

and empathy [4]. These social skills are important to prepare students for social dynamics in the real world, outside the classroom.

It is in this context that digital game-based learning can offer an attractive solution. Many digital games are designed to encourage collaboration, communication and decision-making in situations involving interaction with peers [5]. For example, multiplayer games that require teamwork can help students develop social skills in a more fun and less pressurized environment, allowing them to learn in a more natural social context [6]. In addition, the use of game elements in a hybrid learning context can also facilitate the incorporation of more interactive learning activities, without compromising the quality of students' social experience [7].

However, while there has been much research on the benefits of game-based learning to improve cognitive learning outcomes, there is limited focus on its impact on students' social skills, especially in the context of hybrid education. Most of the previous studies have focused more on cognitive aspects, such as improved comprehension of material or exam results [8][9]. This study aims to fill the gap by examining the effect of digital game-based learning on improving students' social skills in a hybrid education setting.

It is important to note that social skills involve various dimensions, such as the ability to work in teams, effective communication, and conflict management [10]. In game-based learning, students not only learn to interact directly through social media or video conferencing, but also through simulation and collaboration in virtual worlds, which offer new experiences in building social relationships [11]. For example, many digital games are designed to challenge students to collaborate in solving problems, in a way that emphasizes effective communication and shared decision-making [12].

However, the biggest challenge in the implementation of digital game-based learning in hybrid education is how to design effective games that fit the learning objectives and social context of students. Some studies show that games that are too complex or not well integrated in the curriculum can cause frustration or even demotivate students [13]. Therefore, game design that involves a balance between challenge and fun, as well as paying attention to social and academic goals, is crucial to ensure the success of game-based learning [14].

Through this research, it is hoped that stronger evidence can be found regarding the positive influence of digital game-based learning in improving students' social skills, especially in the context of hybrid learning. The findings from this study can also provide guidance for educators and game developers in designing learning experiences that not only encourage mastery of academic material, but also strengthen social skills that are essential for students' personal development.

2. METHOD

2.1. Research Design

This study used a quasi-experimental design to explore the effect of digital game-based learning on improving students' social skills in a hybrid education context. The quasi-experimental design was chosen due to the limitation of fully randomizing the participants, which is due to the pre-structured nature of classroom learning. The study involved two groups: an experimental group that used digital game-based learning and a control group that followed traditional learning without game elements. The study aimed to measure changes in students' social skills before and after the intervention period.

2.2. Participants

The study involved 60 students enrolled at Universitas Pendidikan Nusantara (UPN), who were divided into two groups: an experimental group and a control group. Students in both groups had similar characteristics, including age (16-18 years old), gender, and educational background. A total of 30 students were selected by purposive sampling for the experimental group, while another 30 students were selected for the control group based on the similarity of their classroom conditions and learning schedules. Inclusion criteria included students enrolled in Technology Education and Early Childhood Education study programs, as well as those with access to and basic skills in using digital devices.

2.3. Instruments

To measure changes in students' social skills, two main instruments were used:

1. Social Skills Scale (SKS): A questionnaire developed based on social skills theory that includes dimensions such as communication, empathy, teamwork, and conflict management. The questionnaire consists of 25 items with a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). This instrument has been validated by experts and has a Cronbach's alpha reliability of 0.85 in previous studies.
2. Collaborative Observation: Direct observation was conducted by two trained observers to assess the social interaction between students during the learning session. The criteria observed included the frequency of

verbal interactions, activeness in group discussions, as well as the ability to resolve conflicts that arise in digital games. Observations were conducted in a structured manner using pre-developed guidelines.

In addition, to measure satisfaction with digital game-based learning, a 15-item satisfaction questionnaire was used to assess students' perceptions of game elements, such as fun, challenge, and relevance of the game to learning objectives.

2.4. Procedures

The study was conducted in two main phases: the preparation phase and the intervention phase.

1. Preparation Phase (Pre-Test): Before the intervention began, all participants in both the experimental and control groups were given a pre-test using the Social Skills Scale (SSS) and observed during the learning session to measure their level of social skills. The pre-test was conducted for one week at the beginning of the semester.
2. Intervention Phase (Digital Game-based Learning): The experimental group participated in digital game-based learning for 6 weeks. In this session, the game used was "EduQuest", a digital game specifically designed to support the development of social skills through simulating real-world situations involving cooperation, communication and problem solving in a group context. Each session lasts 90 minutes and is conducted twice a week. During the game sessions, students work in small teams to complete missions or challenges that require them to collaborate and communicate well.
3. Control Group: The control group followed traditional learning methods that prioritized class discussions and individual assignments. They did not use digital games, but instead focused on lecture-based learning and lecturer-guided discussions. Learning took place for the same duration as the experimental group, which was 90 minutes twice a week for 6 weeks.
4. Post-Test Phase: After the intervention phase was completed, both groups were administered a post-test identical to the pre-test to measure changes in students' social skills. In addition, collaborative observations were conducted to assess changes in social interactions during learning. A satisfaction questionnaire was also administered to the experimental group to collect data regarding their experience during the digital game-based learning.

2.5. Data Analysis

Data obtained from the pre-test and post-test of the Social Skills Scale (SSS) were analyzed using a paired t-test to measure changes in social skills within each group (experimental and control). A comparison between the two groups was conducted using an independent t-test to determine if there was a significant difference between the experimental and control groups after the intervention. Collaborative observation data was analyzed qualitatively using thematic analysis technique, which identified certain patterns in students' social interactions during learning. In addition, the results of the satisfaction questionnaire were analyzed descriptively to provide an overview of students' perceptions of digital game-based learning.

2.6. Research Ethics

This study was conducted in compliance with the ethical principles of research. All participants were given clear information about the purpose and procedures of the study, and they were asked to provide written informed consent before participating. The data collected was kept confidential, and the results of the study were only used for academic purposes.

3. RESULTS AND DISCUSSION

3.1. Social Skills Measurement Results

To measure the effect of digital game-based learning on students' social skills, we analyzed data from the Social Skills Scale (SSS) pre-test and post-test. The results of the analysis showed a significant increase in the experimental group who participated in digital game-based learning, while the control group who participated in traditional learning showed no significant change.

The average pre-test score in the experimental group was ($M = 3.12$, $SD = 0.45$), while the post-test score increased to ($M = 4.01$, $SD = 0.38$). The paired t-test results showed a significant difference between the pre-test and post-test ($t = 8.45$, $p < 0.01$), indicating a significant improvement in social skills following the digital game-based learning. This improvement was particularly evident in the dimensions of teamwork, communication, and conflict resolution, where students showed more engagement in group discussions and the ability to resolve conflicts in a more constructive manner.

Meanwhile, the control group showed insignificant changes. The average pre-test score in the control group was ($M = 3.15$, $SD = 0.50$), and their post-test score only slightly increased to ($M = 3.25$, $SD = 0.47$). A

paired t-test showed that there was no significant difference between the pre-test and post-test in the control group ($t = 1.12$, $p > 0.05$).

3.2. Collaborative Observation

The data from the collaborative observation supported the findings obtained from the Social Skills Scale (SSS). Students in the experimental group engaged in more frequent verbal interactions and were more open in group discussions compared to students in the control group. In particular, students in the experimental group showed improvements in teamwork and interpersonal communication skills, which were evident as they worked together in completing tasks that required cooperation. For example, in the digital game "EduQuest", students had to collaborate to complete missions that involved joint problem-solving, which provided opportunities for them to practice social skills first-hand.

On the other hand, students in the control group who followed traditional learning tended to interact less in group discussions and worked more individually. Although they still showed engagement in class activities, their social interactions were limited to direct questions from the lecturer or structured class discussions, which provided less room for the development of deeper social skills.

3.3. Satisfaction with Digital Game-based Learning

The results of the satisfaction questionnaire administered to students in the experimental group showed that they were very satisfied with the digital game-based learning approach. The average satisfaction score was ($M = 4.52$, $SD = 0.41$), with most students stating that the game was very challenging, fun and helped them collaborate more easily with classmates. About 85% of students agreed that the digital games improved their social skills, particularly in terms of teamwork and communication. These results show that the use of game elements in learning not only increases learning motivation, but also strengthens students' social abilities, in accordance with the results obtained from the social skills measurement instrument.

3.4. Discussion

The findings in this study show that digital game-based learning has a significant positive impact on students' social skills, especially in the context of hybrid learning. These results are in line with previous research showing that digital games can be an effective tool in improving students' social skills, as found in the study by Lee et al. (2019), which highlighted how games can improve teamwork and communication in educational settings.

The greater improvement in social skills in the experimental group following digital game-based learning compared to the control group suggests that game elements can create an environment that supports more active social interaction. In digital games, students not only compete in individual tasks, but also collaborate to achieve a common goal, which facilitates the development of better social skills. Digital games allow students to practice skills such as effective communication, problem solving, and negotiation in a more informal and fun context, which is often not found in traditional lecture-based learning.

However, it is important to note that while digital game-based learning can improve social skills, its implementation requires thoughtful design. Games that are not well integrated in the learning objectives or that are overly complex can demotivate students and reduce their effectiveness. Therefore, proper game design, which balances between challenge and fun, as well as compatibility with educational objectives, is crucial to ensure the successful use of digital games in learning.

In addition, although the collaborative observation results showed a significant improvement in students' social skills in the experimental group, the study also found that the positive effect was more pronounced in interactions between students in small groups. Digital game-based learning is more effective in developing social skills in a more intimate setting, where students can get to know each other and collaborate more intensively.

In addition, although the control group did not show a significant increase in social skills, they still experienced a slight improvement. This suggests that while traditional learning may not be explicitly designed to improve social skills, classroom activities that involve discussion and interaction may contribute slightly to the development of such skills.

3.5. Research Limitations and Implications

Although this study showed promising results, there are some limitations that need to be noted. First, the sample used was relatively small, limited to students from one university, so the results may not be generalizable to a larger population. Secondly, the intervention duration of only 6 weeks may not be sufficient to observe long-term changes in students' social skills. Further research with a larger sample and longer

intervention period is needed to explore more deeply the long-term effects of digital game-based learning on students' social skills.

On the other hand, the results of this study have important implications for the development of more interactive and technology-based learning methods, especially in the context of hybrid education. With the widespread use of technology in education, a digital game-based approach could be an attractive alternative to enhance students' social skills that are needed in the workplace and their social life.

4. CONCLUSION

This research shows that digital game-based learning significantly improves students' social skills in the context of hybrid education. Statistical test results and observations indicated that students who participated in digital game-based learning showed significant improvements in teamwork, communication, and conflict resolution skills compared to the control group who participated in traditional learning. In addition, satisfaction questionnaires indicated that students felt more motivated and engaged, which reinforced these results.

Although this study has limitations in terms of sample size and duration, these findings provide important insights for the development of more effective hybrid learning models. Digital game-based learning not only improves students' academic skills, but also helps them develop social skills that are essential for their future professional and social lives.

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