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Research Article

The Effect of the Snowball Throwing Method Assisted by Lumio By Smart on Students' Social Interaction Skills

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Abstract

Students' low social interaction skills in the school environment are driven by the use of teaching methods that lack variety and tend to be teacher-centered. This study aims to examine the effect of the Snowball Throwing method, supported by the Lumio By Smart digital platform, on the social interaction skills of 12th-grade students at Sukodadi State High School 1. The study employed a quantitative approach with a quasi-experimental design, involving one experimental class and one control class; data were collected through questionnaires, observations, and interviews, then analyzed using a t-test at a significance level of 0.05. The results showed that the average score of the experimental class increased from 5.7 to 8.3, with 72% of students falling into the "good" category, while the control class's score rose from 5.6 to 6.8, with 58% of students in the "good" category. The between-class comparison test yielded a t-value of 2.306; $p = 0.024 < 0.05$, confirming a significant difference. The class supported by Lumio By Smart also displayed greater enthusiasm, active communication, and mutual cooperation. It was concluded that the implementation of the Snowball Throwing method supported by Lumio By Smart had a positive impact and was more effective in enhancing students' social interaction in Civic Education (PPKn) lessons, making it a viable alternative interactive learning strategy for developing students' social skills in an educational setting.

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INTRODUCTION

Humans are social beings who depend on one another to fulfill their emotional and physical needs through interaction. Interaction plays a crucial role in encouraging individuals to contribute and build healthy bonds around us (Nurhidayat et al., 2023). Interaction occurs in every activity that allows people to exchange information with one another and strengthen meaningful relationships (Rohanah et al., 2020). Effective interaction can be observed in how one responds to events involving others and the environment (Costa et al., 2024). The process of interaction encompasses various forms of communication involving actions such as speaking, listening, collaborating, and engaging in conflict (Richi et al., 2023). The interaction process enables people to recognize the importance of how to relate to others (Feezel & Jerry, 2018).

Not everyone is able to interact effectively; many people often isolate themselves at home and rarely socialize with others. When encountering people outside the home, they also tend to remain silent rather than greet or smile. This is not limited to the community; even in school settings, many children are indifferent toward their peers. When they struggle with schoolwork, they tend to remain silent rather than discuss it with their peers (Delima & Sari, 2021). To address this issue, efforts are needed to improve declining social values

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by nurturing and guiding children to socialize effectively (Syahyudin, 2019). This involves providing counseling, support, and a solid understanding of social interaction (Nurfatirah et al., 2022), as well as the family's role in guiding children to get along well with those around them (Ramgovind et al., 2024).

In the world of education, poor social interaction among students not only affects their personal relationships but can also impact their learning process, social development, and emotional well-being. There are many factors that influence this, including a lack of self-confidence, a lack of empathy, the presence of bullying, and the influx of new cultural influences (Pauziah, 2022). Therefore, it is important to understand how these factors affect social interaction and how teachers can create an interactive learning environment. One way to create an engaging learning environment is by implementing interactive teaching methods, supported by positive teacher feedback to encourage student interaction within the learning environment (Djimta, 2024). This is because when teachers create an engaging classroom environment, students will be eager and enthusiastic to participate in the learning process (Khan et al., 2024).

Teaching methods are a crucial element in the educational process that facilitate knowledge transfer and enhance student participation. At their core, teaching methods serve as a means of conveying information from teachers to students (Saleh, 2023). In today's highly advanced modern era, there are numerous tools and strategies that can be utilized as teaching methods and media, ranging from audio, visual, and audiovisual media, among others (Moto, 2019). One interactive learning method is the Snowball Throwing technique, an engaging and effective approach to enhancing interaction and collaboration in the classroom (Husen, 2020). Snowball Throwing is an active learning technique in which students write a question or important information on a piece of paper, then roll it up and throw it to another student. The student then opens the note they received and provides an answer to the question.

In today's modern era, various aspects of life have become digital, making it easier for the public to access and stay informed about current events. In the fields of economics and business, digital technology serves as an efficient tool for marketing, promotion, and other purposes. The same applies to the world of education. According to Zulkhi & Jannah (2022), learning is more effective when conducted using media and simulations. Therefore, learning support is needed by leveraging digital technology—whether to enhance existing learning media or to create new ones. According to Yayuk C.M. et al. (2022), learning media are tools, materials, or any resources used to convey lesson content from teachers to students during the teaching-and-learning process. The "Snowball Throwing" learning method is a traditional learning medium that is implemented without the use of digital technology. Therefore, the application of digital technology to support the "Snowball Throwing" learning method represents an innovation in the use of technology to achieve better learning outcomes. One of the many digital learning tools available is Lumio By Smart. Lumio By Smart (formerly SMART Learning Suite Online) is a digital learning platform that helps make lessons engaging and enjoyable, facilitates the sharing of learning experiences, and involves students in the educational process (Osipova & Bagrova, 2021). Lumio By Smart is designed to help teachers and students interact and collaborate in all aspects of learning (Wirda et al., 2023). Lumio By Smart is a digital learning tool that can be used to create and share interactive assessments, import materials such as PDF files, Google Slides, PowerPoint presentations, and notebooks, access and deliver lessons anytime, anywhere, collaborate with students individually or in groups, and play games. The implementation of the "Snowball Throwing" method—which was originally done manually by writing questions on paper becomes more practical with the assistance of Lumio By Smart and is expected to encourage students to participate more actively in the classroom.

Although the Snowball Throwing method and the use of digital learning media have been discussed in the context of learning, the research gap of concern in this study is the lack of empirical evidence specifically examining the combination of the Snowball Throwing method supported by Lumio By Smart on students' social interaction skills in Pancasila and Civic Education (PPKn) lessons. The literature reviewed in this study discusses the benefits of the Snowball Throwing method in active learning as well as the potential of Lumio By Smart in supporting interactive learning; however, it has not specifically addressed the impact of combining these two approaches on students' social interaction skills within the context of PPKn instruction. Therefore, research is needed to test the implementation of this combination and compare the results with the implementation of the Snowball Throwing method without the use of Lumio By Smart. This study is expected to provide an empirical contribution toward the development of learning strategies that not only support

student engagement in understanding the material but also encourage improved communication, collaboration, and social interaction in the school environment.

Based on the above discussion, this study aims to analyze the effect of the Snowball Throwing method supported by Lumio By Smart on students' social interaction skills and to compare the improvement in these skills between the group using Lumio By Smart and the group applying the Snowball Throwing method without the aid of a digital platform. The research findings are expected to serve as a basis for educators in selecting and developing interactive learning methods and media to support the development of students' social skills.

METHOD

This study employed a quantitative approach, specifically a descriptive quantitative study, using a 2 × 2 factorial quasi-experimental design. The study involved two groups: the experimental class (XII A2), which implemented the Snowball Throwing method assisted by Lumio By Smart, and the control class (XII E2), which implemented the Snowball Throwing method without the assistance of Lumio By Smart. Both groups were administered a pretest before the intervention and a posttest after the intervention, with the same allocated learning time. The study population comprised all 12th-grade students at Sukodadi State High School 1 during the even semester of the 2024/2025 academic year, while the sample consisted of class XII A2 as the experimental group and class XII E2 as the control group. Students' social interaction variables were subsequently classified into high and low categories.

Data collection was conducted through a 12-item questionnaire, interviews, and direct observation. Questionnaire data were calculated using Sudijono's (2012) percentage formula and then interpreted based on assessment criteria to determine students' levels of social interaction skills. Data analysis was performed using SPSS version 24.0. The analysis stages included a normality test to determine the data distribution, a homogeneity test to assess the equality of variances, a paired-sample t-test to examine differences in results before and after the intervention, and an independent-samples t-test to compare results between the experimental and control groups. Hypothesis testing used a significance level of 0.05. Data were considered normally distributed and homogeneous if the significance value was greater than 0.05. Meanwhile, the results of the hypothesis testing indicate a significant difference if the significance value (two-tailed) is less than 0.05. These analysis steps were used to determine the differences in the results of applying the Snowball Throwing method with and without the assistance of Lumio By Smart on students' social interaction skills (Fuad & Sujianto, 2014)

RESULTS AND DISCUSSION

This study was conducted at State Senior High School 1 Sukodadi Lamongan from January 27, 2025, to February 3, 2025. This was a quantitative study with a Pre-Test and Post-Test controlled experimental design. Before the instruction began, both the experimental and control classes were administered a pre-test. The pre-test consisted of a questionnaire designed to assess students' initial status prior to the instructional process. The questionnaire results yielded average scores for both the experimental and control classes. After administering the pre-test, the researcher conducted the learning process in the experimental and control classes, applying different instructional treatments while using the same subject matter: the Civic Education (PPKn) lesson on the practice of mutual cooperation in Indonesian society.

Following the pre-test, the teacher briefly explained the core concepts of the material and then proceeded using the Snowball Throwing method without the aid of Lumio By Smart. During the learning process in the control class, students appeared to follow the lesson well. However, some students lacked enthusiasm because each student was asked to create their own questions, and the learning procedures used were also not very innovative. The questions created were also relatively easy, so students were not sufficiently challenged to answer them or collaborate with their peers.

In the experimental class, the teacher also briefly explained the material before proceeding with the Snowball Throwing method, assisted by Lumio By Smart. The implementation of this method differed slightly from that in the control class, as it combined the Snowball Throwing method with a card game available on the Lumio By Smart learning platform. Thus, students did not need to create their own questions; instead, the teacher crafted them, ensuring the questions were more specific to the material and designed to encourage students to think critically and collaborate. The procedure implemented was also engaging because it allowed

all students and the teacher to play an active role in the learning process. Throughout the lesson in the experimental class, students appeared quite enthusiastic about following the lesson flow and worked together to help one another answer questions they found quite difficult. Students also felt challenged to collaborate with their peers.

In addition, the Lumio By Smart platform has a very appealing design—from its style and colors to the diverse elements and functions it offers which effectively fosters students' interest in learning and curiosity about the material being presented. This method emphasizes student engagement and peer interaction through activities that require input and assistance from classmates—ranging from answering questions, posing questions, and exchanging question cards. This approach makes students more enthusiastic about learning, helps them understand each other's personalities, and strengthens the bonds among them.

After the lesson, students were given a post-test in the form of a questionnaire to assess their understanding following the learning process. Based on the questionnaire results, it will be evident whether the use of this method was effective by classifying students' proficiency levels.

Result

The control group, the learning process went fairly well, but some students were not sufficiently challenged because they formulated their own questions, and the resulting questions tended to be simple. In the experimental group, the teacher prepared questions using the Lumio By Smart digital card game. The more focused questions encouraged students to think, provide answers, discuss, and help one another. During the lesson, students in the experimental group appeared more enthusiastic and actively collaborated.

A summary of changes in average scores and social interaction ability categories is presented in Table 1. A comparison of the pre-test and post-test results showed improvement in both groups.

Table 1. Comparison of pre-test and post-test results for students' social interaction skills

Group	Average Pre-test	Average Post-test	Below-average category	Good category
Control	5,6	6,8	22 (61%) menjadi 15 (42%)	14 (39%) menjadi 21 (58%)
Exsperimental	5,7	8,3	22 (61%) menjadi 10 (28%)	14 (39%) menjadi 26 (72%)

The control group experienced an average increase from 5.6 to 6.8. The percentage of students in the "good" category rose from 39% to 58%, while the percentage in the "poor" category fell from 61% to 42%. A greater improvement was observed in the experimental group, with the average score rising from 5.7 to 8.3. The percentage in the "good" category increased from 39% to 72%, while the percentage in the "poor" category decreased from 61% to 28%. These results indicate that both methods led to an improvement in social interaction skills, but the descriptive improvement in the group using Lumio By Smart was greater.

Statistical testing was conducted using SPSS version 24.0 with a significance level of 0.05. The Shapiro–Wilk test showed that the pre-test and post-test data were normally distributed, with the control group having significance values of 0.089 and 0.547, respectively, while the experimental group had values of 0.150 and 0.091. The homogeneity test also indicated homogeneous variances, with significance values of 0.380 in the control group and 0.196 in the experimental group.

Table 2. Summary of hypothesis test results

Testing	Group/Comparison	Statistical Values	Conclusion
Paired sample t-test	Control	$t = 3{,}993$; $p < 0{,}001$	Significant difference between pre-test and post-test
Paired sample t-test	Exsperimental	$t = 8{,}875$; $p < 0{,}001$	Significant difference between pre-test and post-test
Independent sample t-test	Control vs exsperimental	$t = 2{,}306$; $df = 70$; $p = 0{,}024$	Significant difference between groups

Note: The p-value of 0.594 in the independent-samples t-test output is the significance value for the Levene test, not the significance value for the difference in means.

The results of the paired-sample t-test show a significant difference between the pre-test and post-test scores in both the control group ($t = 3.993$; $p < 0.001$) and the experimental group ($t = 8.875$; $p < 0.001$). In the independent-samples t-test, Levene's test yielded $p = 0.594$, indicating that the assumption of equal variances was met. The results of the between-groups comparison showed $t = 2.306$ with $df = 70$ and $p = 0.024$. Thus, there was a significant difference between the two groups after the treatment.

Discussion

Based on the research results, the students' social interaction skills in the control class and the experimental class improved after the intervention. In the control class, which used the Snowball Throwing method, the mean score increased from 5.6 to 6.8. The number of students classified as "good" increased from 14 students (39%) to 21 students (58%), while the number classified as "poor" decreased from 22 students (61%) to 15 students (42%). The results of the paired-sample t-test showed a p-value of 0.000 < 0.05 and a calculated t-value of 3.993 > the critical t-value of 2.030. These results indicate a significant improvement in the control class.

A greater improvement was observed in the experimental class that used the Snowball Throwing method assisted by Lumio By Smart. The mean score increased from 5.7 to 8.3. The number of students classified as "good" increased from 14 students (39%) to 26 students (72%), while those classified as "poor" decreased from 22 students (61%) to 10 students (28%). The results of the paired-sample t-test showed a p-value of 0.000 < 0.05 and a calculated t-value of 8.875 > the critical t-value of 2.030. These results indicate that both classes showed improvement, but the improvement in the experimental class was greater. The difference in results between the classes was also supported by an independent-samples t-test, which showed a significance level (two-tailed) < 0.05, indicating a statistically significant difference in results between the two groups.

The improvement in the experimental class is believed to be related to the use of Lumio By Smart, which supports the "Snowball Throwing" activity through digital card games, more targeted questions, and an interactive learning interface. These activities provided students with opportunities to express their opinions, listen to their peers' answers, engage in discussions, and collaborate to solve problems. This aligns with the findings of Osipova and Bagrova (2021) and Wirda et al. (2023), who discussed the use of Lumio By Smart as a tool to support interactive learning. Additionally, Husen (2020) provides a foundation for the application of the Snowball Throwing method in active learning. The findings of this study expand upon that research by combining both approaches to support students' social interaction skills in Civic Education (PPKn) learning.

Overall, the implementation of the Snowball Throwing method aided by Lumio By Smart demonstrated a greater improvement in social interaction skills compared to using the Snowball Throwing method without digital media support. These results indicate that the combination of active learning methods and interactive media can serve as an alternative for teachers to enhance student participation, communication, and collaboration. However, its success remains influenced by the quality of questions, the design of learning activities, and the teacher's ability to facilitate discussions and interactions among students.

CONCLUSION

This study shows that the implementation of the Snowball Throwing method supported by Lumio By Smart can help improve students' social interaction skills in Civic Education (PPKn) learning. This is evident from the increase in the average score of the experimental class from 5.7 to 8.3, which is higher than that of the control class, which increased from 5.6 to 6.8. The use of Lumio By Smart supports more interactive learning through targeted questions and activities that encourage students to discuss, exchange opinions, and collaborate.

This study has limitations because it involved students from only one school and did not examine the contribution of each Lumio By Smart feature in depth. Therefore, future research is recommended to involve samples from several schools, apply this method to different subjects and educational levels, and further examine the impact of interactive media on student communication, collaboration, and participation. The use of validated instruments and appropriate statistical analysis is also necessary to strengthen the research findings.

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