

The Influence of Using Concrete Media Style Material on the Learning Outcomes and Collaboration Skills of Class IV Students of Mangliawan 1 Public Elementary School

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Abstrak

Dalam konteks pembelajaran IPA, peserta didik dituntut tidak hanya menguasai aspek pengetahuan, tetapi juga mengembangkan keterampilan abad ke-21, salah satunya adalah keterampilan kolaborasi. Permasalahan yang ditemukan di lapangan menunjukkan bahwa keterbatasan media membuat peserta didik sulit memahami materi sehingga hasil belajar menjadi rendah. Keterbatasan media pembelajaran juga kurang membantu peserta didik dalam mengembangkan keterampilan. Pembelajaran IPA yang padat akan materi membutuhkan media yang dapat memberikan pengalaman secara nyata kepada peserta didik, yaitu penggunaan media konkret. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan media konkret gaya terhadap hasil belajar dan keterampilan kolaborasi. Metode kuantitatif pengaruh digunakan dalam penelitian ini. Kelas IVA dan IVB dengan jumlah 60 peserta didik adalah subjek penelitian. Hasil penelitian ini mengungkapkan bahwa rata-rata skor hasil belajar peserta didik mencapai 70,00, yang tergolong dalam kategori tinggi. Sementara itu, keterampilan kolaborasi memperoleh rata-rata skor sebesar 82,00 dengan persentase rata-rata indikator 81,22%, yang juga termasuk dalam kategori tinggi. Uji hipotesis melalui analisis statistik uji-t variabel hasil belajar menunjukkan nilai 0,000 dengan tingkat signifikansi < 0,05. Sementara variabel keterampilan kolaborasi menggunakan uji Mann Whitney menunjukkan nilai 0,023 dengan tingkat signifikansi < 0,05. Hasil temuan ini mengindikasikan adanya pengaruh yang signifikan dan positif antara media konkret gaya terhadap hasil belajar dan keterampilan kolaborasi peserta didik.

Abstract

In the context of science learning, students are required not only to master aspects of knowledge, but also to develop 21st century skills, one of which is collaboration skills. The problems found in the field show that the limitations of the media make it difficult for students to understand the material so that the learning outcomes are low. The limitations of learning media also do not help students in developing skills. Science learning that is dense with material requires media that can provide real experience to students, namely the use of concrete media. This study aims to determine the effect of the use of concrete media styles on learning outcomes and collaboration skills. The quantitative method of influence was used in this study. Classes IVA and IVB with a total of 60 students were the subjects of the study. The results of this study revealed that the average student learning outcome score reached 70.00, which is classified as high. Meanwhile, collaboration skills obtained an average score of 82.00 with an average percentage of indicators of 81.22%, which is also included in the high category. Hypothesis test through statistical analysis of t-test learning outcome variables showed a value of 0.000 with a significance level < 0.05. Meanwhile, the collaboration skill variable using the Mann Whitney test showed a value of 0.023 with a significance level < 0.05. The results of these findings indicate a significant and positive influence between style concrete media on students' learning outcomes and collaboration skills.

1. Introduction

Learning is a process that aims to transfer knowledge and experience to students, supported by models, methods, and media that are tailored to learning conditions and needs (Prihatini & Sugiarti, 2021). One of the subjects that demands the right learning approach is Natural and Social Sciences (IPAS), because it covers abstract concepts and natural phenomena, demanding understanding through scientific activities and active involvement of students (Nur Rezki Pranoto & Sudyanto, 2024). But the actual situation shows that learning science at Mangliawan 1 Public Elementary School still has many problems, especially low learning outcomes and active involvement of students in teaching and learning processes.

In addition to the low science learning achievements, the author also found problems related to the lack of involvement or collaboration of participants in participating in the learning process. The competence of 21st-century students is required to have the ability to not only focus on the cognitive aspect, but also the non-cognitive aspects that students need to have collaboration skills (Mansur et al., 2022). The ability to cooperate and create interaction between students and other students to achieve learning goals is a form of collaboration skills (Rahayu et al., 2019).

The problems that arise that underlie this research are the use of learning media which is still dominated by audio-visual media such as images and videos, as well as the lack of use of concrete media that is in accordance with the material. Concrete-based media offers direct, experiential learning that helps students grasp abstract ideas more effectively while also promoting active participation during lessons. According to interview findings, the teacher noted that even though group discussions are frequently implemented, many students still demonstrate weak collaborative abilities, as they tend to depend on peers in their group and rarely take the initiative to share their own thoughts. This condition shows the need for learning media innovation that is able to encourage students' understanding and social skills.

Previous studies have indicated that concrete media has a beneficial effect on enhancing learning outcomes in IPAS subjects. Research conducted by Nurlaela (2023), titled "The Influence of Concrete Media on Science Learning Outcomes in Students of SDN Bencongan 6, Tangerang Regency", found that concrete media is more effective than traditional media in improving science achievement among fourth-grade students. Similarly, a study by Silalahi (2024), entitled "The Influence of Concrete Object Media on the Science Learning Outcomes of Grade V Students at SDN 091538 Huta Bayu Raja", concluded that the use of concrete object media significantly enhances science learning outcomes for fifth-grade students. However, these studies primarily focus on cognitive aspects, with limited exploration into how concrete media contributes to the development of students' collaboration skills.

This study is driven by the need to introduce diverse learning media that can address the challenges of science education in elementary schools. The purpose of this research is to investigate the effect of using concrete media on the topic of force in relation to both science learning outcomes and the collaboration skills of fourth-grade students at Mangliawan 1 Public Elementary School. The novelty of this study lies in its integration of two key elements of 21st-century learning: enhancing academic performance and fostering collaborative abilities through the application of concrete media. The research focuses on comparing the use of concrete media for teaching force with the conventional media that has been more widely applied. The research gap addressed is the limited number of studies that assess the impact of concrete media not only on conceptual understanding but also on the development of students' collaboration skills, particularly at the elementary school level. Therefore, the findings of this study are expected to serve as an innovative alternative for more effective and student-centered science learning media.

However, these studies primarily focus on cognitive aspects, with limited exploration into how concrete media contributes to the development of students' collaboration skills. Additionally, there has been a lack of comparative analysis between concrete media and more commonly used visual media in elementary schools, particularly in how each influences both cognitive and collaborative competencies simultaneously. This creates a clear research gap in understanding the dual impact of concrete media—on learning outcomes and collaboration—within the context of elementary science learning. Therefore, this study aims to fill that gap by integrating cognitive and collaborative dimensions, offering a more comprehensive understanding of how concrete media can support 21st-century learning goals.

2. Methods

This study employs a quantitative approach with a quasi-experimental design. The aim is to analyze the impact of using concrete media on science learning outcomes, specifically on the topic of force and on the collaboration skills of fourth-grade students. The independent variable (X) in this study is the use of concrete media, while the dependent variables (Y) are learning outcomes and collaboration skills. The study was conducted at Mangliawan 1 Public Elementary School, located at Jl. Raya Wendit Barat No. 30, Mangliawan, in the Malang Regency, East Java Province, during the

second semester of the 2024/2025 academic year. Two classes participated in this research: the experimental class and the control class, each consisting of 30 students from Grade IV A and IV B.

Data collection was carried out using tests. The assessments consisted of objective (multiple-choice) questions administered before and after the intervention in both the experimental and control groups. Each question had one correct answer, with scoring criteria of 1 point for correct responses and 0 for incorrect ones. The control class received instruction using conventional media, specifically audio-visual materials related to the topic of force, while the experimental class was taught using concrete media tailored to the same topic. The primary purpose of the test was to evaluate students' understanding of the force concept and to determine their academic achievement after the intervention. The results were then analyzed to answer the research questions and to test the proposed hypotheses.

To assess collaboration skills, a questionnaire was utilized, developed based on indicators adapted from Meilinawati (2018). The instrument employed a Likert scale ranging from 1 to 5, focusing on positive statements related to students' collaborative abilities. This questionnaire aimed to measure the development of students' collaboration skills following the use of concrete media in the learning process. However, in the control class, the questionnaire was still given with the aim of comparing the results of student scores. The IPAS learning outcome test grid can be seen in Table 1. Meanwhile, collaboration skills are measured using a statement questionnaire with a maximum scoring system of 100, where students will get a full score if they feel strongly about all the indicators in the collaboration skills questionnaire. The assessment rubric for creative writing skills can be seen in Table 2.

Table 1. Grid of IPAS Learning Outcome Test Questions Style Material

| Learning Outcomes | Question Indicator | Number of Questions |
|--|---|---------------------|
| Students can analyze the types, influences, and benefits of style in everyday life | Applying the concept of muscle style in everyday life | 3 |
| Students can analyze the types, influences, and benefits of style in everyday life | Analyze the difference in the effect of force on objects that are moved on rough and slippery surfaces | 4 |
| Students can analyze the types, influences, and benefits of style in everyday life | Describe the gravitational force acting on a free-falling object | 5 |
| Students can analyze the types, influences, and benefits of style in everyday life | Describe and analyze the application of magnetic force to metal and non-metallic objects in everyday life | 4 |
| Students can analyze the types, influences, and benefits of style in everyday life | Assessing and comparing the effect of force on objects moved on different surfaces | 4 |

Table 2. Collaboration Skills Questionnaire

| Collaboration Indicators | Observed Aspects |
|---|---|
| Positive Interdependence | Work on the basis of tasks and interdependence rather than doing it alone |
| Direct Interaction with the Media | Use the learning media available in the completion of group assignments |
| Individual Accountability and Personal Responsibility | Be responsible for the completion of tasks |
| Communication skills | Actively discuss with your group mates in doing tasks |

| | |
|-----------------------------|--|
| Skills of Working in Groups | Actively participate in conveying ideas or ideas in completing tasks |
|-----------------------------|--|

The alternative answers to fill in each statement item on the questionnaire who adapted by Sugiyono (2019) can be seen in table 3. below.

Table 3. Alternative Answers to Collaboration

| Alternative Answers | Respondent Score |
|------------------------|------------------|
| Totally Disagree (STS) | 1 |
| Disagree (TS) | 2 |
| Undecided (R) | 3 |
| Generally Agree(S) | 4 |
| Totally Agree (SS) | 5 |

Validating and testing the reliability of research instruments across multiple participants is an essential step that must be completed prior to conducting the main study. Content validity was assessed by expert lecturers, while empirical validity and reliability were examined using a sample of 24 fourth-grade students from Mangliawan 2 Public Elementary School. The reliability of the instruments was tested using the Cronbach's Alpha method, and empirical validity was analyzed through the Pearson Product Moment correlation using SPSS version 22. Following these assessments, prerequisite tests were conducted, including the normality test using the Shapiro-Wilk method and the homogeneity test using Levene's Test. Once the data was confirmed to be normally distributed and homogeneous, hypothesis testing was performed using the Paired Sample T-Test, Independent Sample T-Test, and N-Gain Score analysis for the learning outcome variable. As for the collaboration skill variable, since the data did not meet the assumption of normality, a non-parametric test, the Mann-Whitney U test, was used, also assisted by SPSS version 22. The interpretation of the learning outcome categories was based on guidelines adapted from by Sugiyono (2019) the results can be seen in Table 4. Meanwhile, for the interpretation of the collaboration skill category adapted by (Sari & Atiningsih, 2023) can be seen in Table 5.

Table 4. Interpretation of N-Gain Test Results Learning Outcome Score

| N-Gain Test Value | Category |
|--------------------|----------|
| $g \geq 0.7$ | Tall |
| $0.7 > g \geq 0.3$ | Keeping |
| $g < 0.3$ | Low |

Table 5. Interpretation of Collaboration Skills

| Percentage Score | Collaboration Skills Criteria |
|------------------|-------------------------------|
| 80% - 100% | Excellent |
| 60% - 80% | Proficient |
| 40% - 60% | Satisfactory |
| 20% - 40% | Needs Improvement |
| 0% - 20% | Very Low |

3. Results and Discussion

3.1. Result

Before the research is carried out, the instruments that have been prepared must go through the initial stage, namely the validity and reliability test, which includes expert validity tests, empirical validity tests, and reliability tests. The expert validity test in this study has been assessed by PGSD lecturers at the State University of Malang, namely MAT with a final result of 97 for the test instrument and 100 for the questionnaire instrument, which means it is very valid. Thus, it can be concluded that the test instruments and questionnaires are suitable for data collection at the target school, namely Mangliawan 1 Public Elementary School. The data from the validity and reliability test results were obtained through a trial of the distribution of test instruments and questionnaires carried out in grade IV of Mangliawan 2 Public Elementary School which amounted to 24 students. The implementation of instrument trials for this study will be carried out on May 13, 2025. The results of the validity test can be seen in table 6. below.

Table 6. Results of the Test and Questionnaire Validity Test Instrument

| Variable | Items | r Count | r Table | Information |
|----------------------|-------|---------|---------|-------------|
| Learning Outcomes | 1 | 0,486 | 0,404 | Valid |
| | 2 | 0,440 | 0,404 | Valid |
| | 3 | 0,445 | 0,404 | Valid |
| | 4 | 0,521 | 0,404 | Valid |
| | 5 | 0,554 | 0,404 | Valid |
| | 6 | 0,554 | 0,404 | Valid |
| | 7 | 0,511 | 0,404 | Valid |
| | 8 | 0,421 | 0,404 | Valid |
| | 9 | 0,487 | 0,404 | Valid |
| | 10 | 0,414 | 0,404 | Valid |
| | 11 | 0,745 | 0,404 | Valid |
| | 12 | 0,459 | 0,404 | Valid |
| | 13 | 0,511 | 0,404 | Valid |
| | 14 | 0,408 | 0,404 | Valid |
| | 15 | 0,507 | 0,404 | Valid |
| | 16 | 0,488 | 0,404 | Valid |
| | 17 | 0,434 | 0,404 | Valid |
| | 18 | 0,445 | 0,404 | Valid |
| | 19 | 0,598 | 0,404 | Valid |
| | 20 | 0,446 | 0,404 | Valid |
| Collaboration Skills | 1 | 0,442 | 0,404 | Valid |
| | 2 | 0,498 | 0,404 | Valid |
| | 3 | 0,514 | 0,404 | Valid |
| | 4 | 0,405 | 0,404 | Valid |
| | 5 | 0,447 | 0,404 | Valid |
| | 6 | 0,454 | 0,404 | Valid |
| | 7 | 0,422 | 0,404 | Valid |
| | 8 | 0,522 | 0,404 | Valid |
| | 9 | 0,656 | 0,404 | Valid |
| | 10 | 0,474 | 0,404 | Valid |
| | 11 | 0,627 | 0,404 | Valid |
| | 12 | 0,490 | 0,404 | Valid |
| | 13 | 0,722 | 0,404 | Valid |
| | 14 | 0,732 | 0,404 | Valid |
| | 15 | 0,421 | 0,404 | Valid |
| | 16 | 0,453 | 0,404 | Valid |
| | 17 | 0,474 | 0,404 | Valid |
| | 18 | 0,587 | 0,404 | Valid |
| | 19 | 0,741 | 0,404 | Valid |
| | 20 | 0,751 | 0,404 | Valid |

Referring to table 6 above, all twenty items in each instrument have been confirmed as valid. Both the test items and the questionnaire have fulfilled the established indicators and align with the predefined blueprint. Since the calculated correlation coefficient (r-calculated) exceeds the critical value (r-table), the items in the IPAS learning outcome test and the collaboration skills questionnaire are deemed valid. Given that responses were collected from 24 students, the r-table value for this validity test is 0.404. Table 7 below presents the results of the reliability analysis for the learning outcome and collaboration skill variables.

Table 7. Results of Instrument Reliability Test Learning Outcomes and Collaboration Skills

| Variable | N | Cronbach Alpha Values | Value of r Coefficient | Information | Criterion |
|----------------------|----|-----------------------|------------------------|-------------|-----------|
| Learning Outcomes | 30 | 0,833 | 0,70 | Reliable | Very High |
| Collaboration Skills | 30 | 0,874 | 0,70 | Reliable | Very High |

It is known from the table that the variables of learning outcomes and collaboration skills have an Alpha Cronbach value greater than 0.7. Specifically, the Alpha Cronbach score for learning outcomes is 0.833, while the value for the collaboration skill variable is 0.874. Based on these findings, it can be said that this research instrument is trustworthy and suitable for use in future studies. The implementation of the research for further data collection, after the completion of the validity and reliability test procedure. The research findings are then produced by processing and analyzing the collected data. The research data collection technique was carried out between May 16-20, 2025. The research sample includes all fourth grade students of Mangliawan 1 Public

Elementary School, District, Malang Regency, in the 2024/2025 school year, with a total of 60 students with each class totaling 30 students. The study findings related to the two variables can be observed in Table 8, namely the outcomes of descriptive analysis, while in Table 9 the outcomes of the normality test are shown, in table 10 the outcomes of the homogeneity test are shown, in table 11 the outcomes of the t-test are shown in the learning outcomes of IPAS, in table 12 the outcomes of the Mann-Whitney test of collaboration skills are shown, in table 13 the results of the N-Gain score on the learning outcome variable, And in table 14, the outcomes of the average percentage of students' collaboration skills are shown.

Table 8. Results of Descriptive Analysis of Learning Outcome Variables and Collaboration Skills

| Descriptive Analysis | Pretest (Control) | Posttest (Control) | Pretest (Experiment) | Posttest (Experiment) | Questionnaire (Control) | Questionnaire (Experiment) |
|----------------------|-------------------|--------------------|----------------------|-----------------------|-------------------------|----------------------------|
| N | 30 | 30 | 30 | 30 | 30 | 30 |
| Average | 41,33 | 55,83 | 46,33 | 70 | 76,73 | 82 |
| Min | 10 | 40 | 20 | 55 | 58 | 73 |
| Max | 70 | 75 | 60 | 85 | 92 | 97 |
| Standard Deviation | 11,739 | 9,105 | 10,580 | 7,427 | 7,852 | 6,464 |

Referring to table 8. above which shows the outcomes of the descriptive analysis of the two variables, it can be seen that in the variables of learning achievements both in the control class and in the experimental class there was an improve in the value of the pretest and posttest, focusing on the experimental class that was given treatment using concrete media the posttest results increased rapidly as seen from the average obtained. In the collaboration skill variable, the average results obtained were also higher in the experimental class, where collaboration skills were more visible and developed using concrete media.

Table 9. Normality Test Results of Learning Outcomes and Collaboration Skills Variables

| Result | Class | Shapiro-Wilk | | |
|--------|--------------------------|--------------|----|------|
| | | Statistics | Df | Sig. |
| | Pretest Control | ,964 | 30 | ,389 |
| | Posttest Control | ,950 | 30 | ,172 |
| | Pretest Experiment | ,933 | 30 | ,060 |
| | Posttest Experiment | ,945 | 30 | ,123 |
| | Questionnaire Control | ,982 | 30 | ,879 |
| | Questionnaire Experiment | ,918 | 30 | ,024 |

Based on the results of table 9. showed, showing that the normality test using Shapiro-Wilk through the help of SPSS version 22 on the learning outcome variable of normally distributed data because the significance value is more than 0.05, so that the learning outcome variable can continue at the homogeneity test stage, meanwhile, in the collaboration skill variable, the data is not distributed normally, because in the experimental class questionnaire, the significance value is less than 0.05, which is 0.024, Therefore, after continuing with the homogeneity test, the collaboration skill variable to determine the hypothesis will use a non-parametric test, namely the Mann-Whitney test.

Table 10. Homogeneity Test Results

| | Living Statistic | df1 | df2 | Sig |
|------------------------|------------------|-----|-----|------|
| IPAS Learning Outcomes | 1,909 | 1 | 58 | ,173 |
| Collaboration Skills | ,479 | 1 | 58 | ,491 |

Referring to table 10. which presents the homogeneity of the two variables, in the learning outcome variable, a significance value of 0.173 (Based On Mean) is more than 0.05, then the data has a homogeneous or equal variance. While the collaboration skill variable obtained a significance value of 0.491 (Based On Mean) which is more than 0.05, the questionnaire data has a homogeneous or equal variance. Although in the collaboration skill variable, the data had a homogeneous variance, the hypothesis test was conducted through a non-parametric test because the data was not normally distributed.

Table 11. Results of Hypothesis Test (T-Test) Learning Outcome Variables

| Hypothesis Test | t | df | Sig. (2-tailed) |
|-----------------|---|----|-----------------|
|-----------------|---|----|-----------------|

| | | | |
|---------------------------|--------|----|------|
| Paired Sample T-Test | 13,569 | 29 | ,000 |
| Independent Sample T-Test | 6603 | 58 | ,000 |

Based on table 11. above, showing that the learning outcome variable obtained a GIS value. (2-tailed) 0.000 in the paired sample T-Test and independent sample T-Test, where the outcomes show a value of less than 0.05, so that the conclusion can be drawn that the hypothesis is accepted. In addition to the difference and improvement in learning outcomes from before being treated to after being treated, the test results also showed a difference in results that were far from the control class and the experimental class, and showed the effect of the use of "Gaya" concrete media on student learning achievements.

Table 12. Mann-Whitney Collaboration Skills Test Results

| Test Statistics ^a | |
|------------------------------|---------|
| | Score |
| Mann-Whitney U | 296,500 |
| Wilcoxon W | 761,500 |
| Z | -2,273 |
| Asymp. Sig. (2-tailed) | ,023 |

Based on table 12. above, the collaboration skill variable through the Mann-Whitney test is shown by the result of the Asymp Sig. (2-tailed) value of 0.023 which is less than 0.05, so that it can be concluded that the hypothesis is accepted, meaning that there is an influence of the use of "Gaya" concrete media on collaboration skills.

Table 13. N-Gain Test Results of Social Science Learning Outcome Scores

| Class | Pre-Test | Post-Test | Average N-Gain | Average N-Gain |
|------------|----------|-----------|----------------|----------------|
| | Average | Average | Score | Percent |
| Control | 41,33 | 55,83 | 0,228 | 22,8% |
| Experiment | 46,33 | 70,00 | 0,432 | 43,2% |

Referring to Table 13 above, the N-Gain calculation indicates that the control group achieved an average N-Gain score of 0.228 or 22.8%, which falls into the low category. In contrast, the experimental group obtained an average N-Gain score of 0.432 or 43.2%, which was included in the medium category. This shows that the improvement in learning outcomes in the experimental class is higher than in the control. In accordance with the results of the t-test and the N-Gain test score on the learning outcome variable, it shows that the hypothesis is accepted, so that it can be concluded that there is an influence of the use of concrete media "Gaya" on the learning outcomes of grade IV students.

Table 14. Mean Percentage of Students' Collaboration Skills

| Class | Average Percentage | Criterion |
|------------|--------------------|-----------|
| Control | 76,30% | Good |
| Experiment | 81,22% | Excellent |

Based on table 14. above, the variation in the mean percentage of collaboration skills questionnaire scores between the control and experimental groups is illustrated. While the control class achieved a good level with a score of 76.30%, the experimental class, which received instruction using concrete media, reached a significantly higher average of 81.22%, placing it in the very good category. Among the indicators assessed in the experimental group, "Direct Interaction with Media" recorded the highest percentage. These findings suggest that the collaboration skills of fourth-grade students were more evident and better developed when concrete media was utilized in teaching the concept of force.

3.2. Discussion Science Learning Outcomes

Concrete learning media is very suitable for use in elementary schools, because students can see directly what they learn without having to imagine the learning process, students also respond better to observe the learning process than to teach without using certain learning media. Concrete media is a learning medium that uses real objects to help provide students with an understanding of a

material because with this media it is able to provide real examples and experiences (Nurlaela et al., 2023).

In accordance with the theory that has been studied previously, namely expert opinions, one of which according to Dale states that students in the learning process need direct experience (Indriyani, 2024). In this case, it means that educators must be able to create the learning that students need to be actively involved in every learning process. Through the active participation of students, they will feel the meaning of the concept of lifelong learning. In a study conducted by Evi Hikma Setyarini et al., (2022) stating that the use of media in learning is important and is an effective solution that educators can use to improve student learning outcomes.

The Cone of Experience theory emphasizes the importance of using learning media to help improve students' educational experiences. In addition to being in accordance with the theories of these experts, the results of this study are also in line with the results of research conducted by Nurlaela et al (2023) which states that the use of concrete media in learning can improve the quality of education, because of the nature of concrete media itself, such as providing clear and specific information when using real and direct objects, so that it can foster real experiences for students and facilitate the understanding of information that seems abstract. Through the selection of the right media, the teaching and learning process will be more interesting and can increase the brain's absorption of material and improve memory.

Concrete media makes students able to use their skills such as working together when solving problems on the activity sheet according to their own knowledge and understanding. In addition, concrete media can help develop students' skills with a real understanding of concepts. This is in line with Piaget's cognitive theory Agung (2019) which states that the child will be sufficiently developed to apply logical reasoning to the concrete operational stage, but only for concrete objects, they are not yet ready to deal with abstract concepts.

These results align with Junitasari & Heryanto (2024) who found that the use of concrete media significantly improved science learning in elementary schools. However, unlike those previous studies, this research simultaneously assessed collaboration aspects, adding a more holistic perspective on learning. Furthermore, while Ristika Ulyartha Silalahi et al (2024) highlighted improvements in science achievement using object media, they did not address whether such gains also encouraged active student participation or collaboration, as shown in this study.

Collaboration Skills

Educators must optimize 21st century skills, especially collaboration skills, by using learning media that suit the personality of students (Mona & Rachmawati, 2023). Media that provides direct experience so that students can improve their collaboration skills is concrete media. The observation results showed that with assignments, it helped students to focus more on collaboration with their friends. The collaboration indicator achieved with the highest score, namely direct interaction with the media, shows that students are more interested in media that can provide real-time.

The use of concrete media not only helps students to improve learning outcomes, but also interaction with the surrounding environment. Students at the concrete operational stage must develop interactions, especially with peers. The interaction between students will certainly create cooperation or collaboration. Through the use of concrete media, students can understand how to collaborate well and encourage them to interact with each other without fear between both students and educators. In accordance with Vygotsky's theory, educators are encouraged to be able to use collaborative learning strategies with an interactive atmosphere and utilize all facilities as educational resources for students (Suci, 2018). So that by paying attention to this, students will be able to further improve their collaboration skills.

The concrete media used in student learning focuses on style material, where students are given assignments in groups to understand the concept of style and the influence of style in daily life. The concrete media is able to create a more even interaction both with the media and with their peers. In addition, students are more active in knowing how the media works, so that every student can feel the concrete media. The collaboration that emerges is also more meaningful, students are more likely to share their opinions and determine whether the concept of style evidenced by the use of media is

true or not. In addition, students also show good collaboration with each other as seen from interaction with the media and complete the activity sheets that have been given.

Research results from Setiana & Muslim (2024) which shows that students' collaboration skills improve because all participants in the group have to work together to work on the LKPD and students feel greatly benefited by using concrete objects to help them visualize abstract concepts. In accordance with this research, where students are able to collaborate well because of the responsibility to complete the activity sheet and can complete it well when there is an adequate and easily accessible learning media, namely concrete-style media.

This finding is in line with Mona & Rachmawati (2023), who emphasized that project-based learning can enhance collaboration skills. However, this study contributes a new dimension by demonstrating that the use of concrete media—without necessarily adopting a specific model such as PBL—can independently support collaboration development. This underscores that the selection of media plays a crucial role in shaping students' social interaction, not only the instructional model used. Compared to Setiana & Muslim (2024), who employed problem-based learning supported by concrete objects, our findings confirm that even with simpler implementations, concrete media alone can promote equitable group participation and engagement.

Practical Implications

The results of this study suggest that elementary school teachers should consider integrating concrete media into science lessons, especially for abstract topics such as force. Concrete media not only facilitate a deeper conceptual understanding but also foster collaborative behaviors among students. In classrooms where student engagement and peer interaction are low, such media can serve as a strategic tool to stimulate participation and accountability. This study highlights the need for school stakeholders to provide adequate resources and training for teachers to develop and use concrete media effectively, particularly in large or resource-constrained classrooms.

3.3. Conclusion

Based on these findings, the learning outcomes of social studies for students have increased after treatment using concrete media. From an average of 46.33 it increased to 70.00 which is included in the high category. In addition, the collaboration skills of students in classes who were treated using concrete media were also included in the very good category as seen from the results of the average percentage of indicators, which was 81.22%. In this finding, among grade IV students of Mangliawan 1 Public Elementary School, it was found that there was a positive and significant influence between the influence of the use of concrete media on learning outcomes and collaboration skills. Based on the statistical tests that have been carried out, namely the hypothesis test using the t-test and the Mann-Whitney test, it can be concluded that H_a is accepted and H_o is rejected. The results of the hypothesis test produced a sig value of $0.000 < 0.05$ for the learning outcome variable and the Asymp sig value. (2-tailed) $0.023 < 0.05$ for the collaboration skill variable. If the sig value is less than 0.05, then H_a is accepted and H_o is rejected based on existing decision-making criteria. With a significance value that meets the decision-making criteria, the use of concrete media in style materials has a positive and significant influence on the improvement of IPAS learning outcomes and the development of collaboration skills of grade IV students at Mangliawan 1 Public Elementary School.

Author's Contributions

All authors have the same contribution to this paper. All authors have read and approved the final manuscript. The following is a description of the author's contribution in this study.

Elya Mardyani: Conceptualization, Methodology, Data Curation, Investigation, Writing –Original Draft, Visualization.

Esti Untari, S.Pd., M.Pd : Corresponding Author, Methodology, Supervision, Writing – Review and Editing.

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