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# Innovative Diorama Learning Media to Improve Elementary School Students' Natural and Social Science Learning Outcomes

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## *Abstrak*

*Guru masih terbatas dalam penggunaan media pembelajaran benda konkret pada mata pelajaran IPAS sehingga hasil belajar peserta didik rendah. Tujuan penelitian ini yaitu mengembangkan media pembelajaran diorama inovatif untuk meningkatkan hasil belajar peserta didik pada materi keberagaman budaaya Indonesia. Jenis penelitian ini yaitu penelitian pengembangan atau research and development (R&D) dengan model Borgh and Gall. Subjek penelitian yaitu ahli media pembelajaran, ahli materi pembelajaran, dan guru. Populasi dalam penelitian ini berjumlah 25 peserta didik. Metode Pengumpulan data adalah metode wawancara, dokumentasi, angket dan tes. Instrumen pengumpulan data berupa kuesioner dan soal tes. Teknik analisis data yaitu analisis kuantitatif dan statistik inferensial. Hasil penelitian yaitu validasi ahli materi dengan kategori sangat layak dan validasi ahli media dengan kategori sangat layak. Berdasarkan hasil uji t yaitu menggunakan uji paired sample t-test pada skala besar dan skala kecil menunjukan terdapat perbedaan yang signifikan setelah digunakan media diorama. Berdasarkan hasil uji N-gain pada skala kecil yaitu 88 (tinggi) dan pada skala besar yaitu 70 (sedang) yang berarti terdapat peningkatan nilai antara prettest dan posttest. Disimpulkan bahwa penggunaan media pembelajaran diorama inovatif mampu meningkatkan hasil belajar peserta didik pada mata pelajaran IPAS.*

***Kata Kunci:*** *Media Pembelajaran, Diorama Inovatif, IPAS, Hasil Belajar*

## Abstract

Teachers are still limited in using concrete object learning media in Natural and Social Sciences subjects, so student learning outcomes are low. This study aims to develop innovative diorama learning media to improve student learning outcomes in the material on Indonesian cultural diversity. This type of research is research and development (R&D) with the Borgh and Gall model. The study subjects were learning media experts, learning material experts, and teachers. The population in this study was 25 students. Data collection methods were interview methods, documentation, questionnaires and tests. Data collection instruments were in the form of questionnaires and test questions. Data analysis techniques were quantitative analysis and inferential statistics. Material experts validated the study results with a very feasible category, and media experts with a very feasible category. The results of the t-test, namely using the paired sample t-test on a large and small scale, showed a significant difference after using diorama media. Based on the results of the N-gain test on a small scale, namely 88 (high) and on a large scale, namely 70 (moderate), there was an increase in value between the pretest and posttest. It is concluded that innovative diorama learning media can improve student learning outcomes in Natural and Social Sciences subjects.

**Keywords:** Learnning Media, Innovative Dioramas, IPAS, Learning Outcomes

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## 1. INTRODUCTION

Education is a conscious effort to develop one's potential in the spiritual aspects of personality, intelligence, noble morals and skills. Therefore, education is expected to create a learning atmosphere and learning activities that can improve students' knowledge and skills (Idhayani et al., 2021; Melinda et al., 2017).In order to realize effective learning activities, facilities are needed in learning activities (Dover & Valls, 2018; Suryawati & Osman, 2017).In the independent curriculum, students are required to be more active and able to develop the ability to think critically, creatively, independently, have faith in God Almighty, have noble character, work together and have global diversity in learning activities (Rahayu et al., 2022; Sadieda et al., 2022; Silvia et al., 2023).The independent curriculum has several

innovations, one of which is the integration of learning materials, namely Science and Social Sciences into Natural and Social Sciences (IPAS). The reason for the integration of Science and Social Sciences into IPAS is that elementary school students are able to view things as a whole, are able to develop holistic thinking related to the natural and social environment, and strengthen the profile of Pancasila students (Adnyana & Yudaparmita, 2023; Muhardini et al., 2023).

Natural and Social Sciences (IPAS) are arranged systematically, so that learning takes place interactively and encourages the active role of students which aims to encourage children's creativity and psychology. IPAS is a unity that is expected to be able to develop students' critical thinking attitudes. In learning activities, students are required to get maximum learning results (Adnyana & Yudaparmita, 2023; Muhardini et al., 2023). The learning outcomes include cognitive, affective, and psychomotor. Cognitive is related to the intellectual abilities and skills of students in thinking (Juwantara, 2019; Nursa'adah et al., 2016).Affective relates to attitudes, abilities and emotional mastery such as the ability to control feelings, attitudes and values (Hutapea, 2019; Widyantari et al., 2019).Psychomotor is related to a skill or physical movement carried out by students in learning activities (Eliza et al., 2019; Heri et al., 2017).

However, the problem that occurs today is that there are still many students who get low learning outcomes. Previous research findings also revealed that low learning outcomes in students are caused by learning activities not running optimally (Adnyana & Yudaparmita, 2023; Surya et al., 2023).Other findings also revealed that the lack of learning media also has an impact on low learning outcomes (Mahardika & Siswoyo, 2021; Wulandari et al., 2019).Based on the results of observations and interviews that have been conducted, it was found that the implementation of science learning at SDN Ngaliyan 05 was in accordance with educational standards, but there were still some shortcomings. One of them is the use of learning media that has not been maximized. In science learning activities, students are less enthusiastic, easily bored with the material presented by the teacher so that student activity is still less than optimal. Teachers are still limited in developing concrete object learning media as a means to convey teaching materials to students. This causes science learning outcomes to be less than optimal. Based on data from grade IV teachers, the average social studies score is still below average.

The results of documentation on student learning outcomes in the even semester of the IPA content include daily test scores from chapter 6, namely the diversity of Indonesian culture, Mid-Semester Assessment, and Final Semester Assessment. The daily test scores in chapter 6 of Class IV were obtained as follows, an average score of 62 was obtained with details of a total of 28 students, 17 (60%) students who had not completed the KKM, and 11 (40%) remaining completed the KKM. While for the PTS score, an average score of 63 was obtained with details of a total of 28 students, 12 (42%) students completed the KKM, and 16 (57%) students had not completed the KKM. In the Final Semester Assessment, the following was obtained, chapter 6 obtained an average score of 64 with details of a total of 28 students, 9 (32%) students completed the KKM and 19 (67%) students had not completed the KKM. It was concluded that in science learning, students had difficulty in understanding the learning material and students were less active in receiving the material presented by the teacher during the learning activities.

Based on this, a tool is needed that can help students in learning. One solution offered is to use learning media as a communication tool in delivering material. Learning media is a medium used to convey learning objectives so that students obtain new concepts (Septian & Tampubolon, 2015; Yasa et al., 2017). One of the learning media that can be used is an innovative diorama. Diorama media provides a real view of objects but in a smaller form. Diorama media is a static or still exhibition media designed to convey information and

knowledge about real events that occurred in the past, present, or future in 3-dimensional form (Pratiwi, 2022; Rusdi et al., 2022).Diorama is a miniature view that depicts a real view. This diorama media has the advantage of providing direct experience, concrete presentation can avoid verbalism, can show objects in their entirety, can show a flow or process clearly, uses simple and easy-to-make materials, and can be observed directly (Santhi et al., 2020; Sidyawati et al., 2021).The implementation of this diorama is also expected to enable students to play an active role in learning activities and to create an educational and enjoyable learning atmosphere.

Previous research findings revealed that diorama learning media can be used to improve student learning outcomes (Kustadiyono, 2020; Wardoyo et al., 2022).Other research also reveals that diorama media can increase students' enthusiasm and activeness in learning (Ainurrahmah & Erwin, 2022; Budiani et al., 2023).It is concluded that innovative dioramas can be used to improve student learning outcomes. The innovative diorama that will be developed is in the form of concrete object media whose objects come from real objects but in a smaller size or in the form of miniatures equipped with learning videos via barcodes contained in the diorama. Therefore, the innovation in this diorama is assisted by audio-visual in the form of learning videos containing material on cultural diversity in three provinces on the island of Java. The provinces used as material in this innovative diorama media are West Java, Central Java and East Java. The advantage of this media is that it is able to attract students' interest in learning so that it can improve students' learning outcomes. There has been no study on innovative diorama learning media in science subjects to improve the learning outcomes of grade IV elementary school students. Based on this, the purpose of this study is to develop innovative diorama learning media in science subjects.

## 2. METHODS

Brogh & Gall model, which consists of several stages. First, Potential and problems. At this stage, it is carried out by conducting observations and interviews with grade IV teachers of Ngaliyan 05 Elementary School, Semarang City. Second, Information collection. At this stage, a questionnaire is distributed to determine and analyze the needs of teachers and students for concrete object learning media. Third, Product design. At this stage, the researcher designs a product in the form of an innovative diorama which will later be used in research activities. Fourth, design validation, Fifth, Product revision. Sixth, Product trial. At this stage, a product trial is carried out on a small group. This small group consists of 2 top-ranking students, 2 middle-ranking students and 2 bottom-ranking students. Seventh, Product revision. At this stage, a product revision is carried out if there are suggestions for responses from teachers and students. Eighth, Usage trial. This research was conducted in grade IV of Ngaliyan 05 Elementary School, Semarang City.

The subjects of the study were learning media experts, learning material experts, and teachers. The population in this study were students of grade IV of SDN Ngaliyan 05 Semarang City. The number of students in grade IV was 25. The sample taken represented the entire population. The sampling technique used in this study was purposive sampling by taking 6 students from the top 2, middle 2 and bottom 2. This study used large groups and small groups. The small group here was taken from a sample of 6 students from the total number of students in grade IV. While for the large group, the remaining students who were not sampled were 19 students. Furthermore, both groups were given the same treatment, namely pre-test and post-test at alternating times. The data collection method in this study used observation, interviews, and tests. Observation and interviews were used to find out the problems that occurred. The test method was used to find out the results of learning science of grade IV elementary school students. The research instrument used during the pre-test and

post-test was a multiple choice consisting of 25 questions. In compiling the instrument for the learning outcome test of the participants of the Indonesian cultural diversity material, the test grid was compiled according to the competencies to be achieved. The instrument grid is presented in Table 1.

**Table 1.** Learning Media Instruments

| No. | Rated Aspect |
|---|---|
| 1 | Easy to use media |
| 2 | The instructions for use on the media are clear. |
| 3 | Suitability of component layout in the learning media created |
| 4 | Appropriateness in choosing the size and type of letters used in the media |
| 5 | Attractive design colour selection |
| 6 | Interesting selection of media backgrounds and miniatures |
| 7 | Attractive media presentation |
| 8 | The writing on the media can be read clearly |
| 9 | The suitability between miniatures and learning materials |
| 10 | Suitability in choosing miniature forms with learning materials |
| 11 | Suitability of the form of learning media design with the characteristics of students |
| 12 | Backsound used in Interesting media |
| 13 | The use of sound in the media is appropriate |
| 14 | The format and appearance of the videos provided are attractive and appropriate to the subject matter. |
| 15 | Learning media that is made easy to understand by both teachers and students |

The data analysis method in this study is quantitative data analysis and inferential statistics. The research data will be tested several times to determine the success or failure of the research that has been carried out previously. In the research instrument test, validity tests, reliability tests, discriminatory power tests and difficulty level tests are carried out. In the data processing process, normality tests, paired-tests and N-gain tests are carried out. In the data processing, it is carried out to determine whether there is a significant difference in student learning outcomes before and after the use of innovative diorama media in the subject of science on the subject of Indonesian cultural diversity.

## 3. RESULTS AND DISCUSSION

### Result

This study aims to develop innovative diorama learning media in science subjects using the Brogh & Gall model. First, Potential and problems. The results of the observation can be identified as a problem that the school has been equipped with LCD but has not been equipped with PCs or laptops as facilities and infrastructure in learning activities. Second, information collection. The results of the analysis show that teachers and students need concrete object learning media. Third, Product design. At this stage, the researcher designs a product in the form of an innovative diorama used in research activities. The product design here includes the concept of the diorama, the materials needed, the innovations that will be developed in the diorama, learning achievements and objectives, learning videos, and bibliographies or references. Fourth, design validation. At this stage, validation is carried out by expert lecturers in the field of media and materials. The validation results show that the percentage of media validation is 100% (very feasible) and the percentage of material validation is 96% (very feasible). The assessment by experts can be seen in table 2.

**Table 2.** The Validation Table

| No. | Test Subject | Percentage | Category |
|---|---|---|---|
| 1 | Media expert | 100% | Very Worth It |
| 2 | Subject matter expert | 96% | Very Worth It |

Fifth, Product revision. After carrying out validation, the next step is to revise the product based on suggestions from experts. However, in this study, experts from both media experts and material experts did not provide suggestions, so the product was not revised. Sixth, Product trial. At this stage, a product trial was conducted on a small group. At this stage, a questionnaire was also distributed regarding teacher responses to innovative diorama learning media. The results of the data analysis showed that the percentage of teacher responses to innovative diorama media was 100%, which means it is in the very feasible category. Furthermore, the percentage of student responses to innovative diorama media was 97%, which is in the very feasible category.

Seventh, Product revision. At this stage, product revision is carried out if there are suggestions for responses from teachers and students. However, in this study there were no suggestions from teachers or students regarding the innovative diorama media used in learning activities. Therefore, it was continued to the next stage, namely the trial use. Eighth, Trial use. At this stage, a trial was carried out on a large group in class IV of Ngaliyan 05 Elementary School, Semarang City. The number of students in this large group was 19 students. Before carrying out learning activities, students carried out a pre-test and after carrying out learning, students were also given a post-test with the aim of measuring the effectiveness of the learning media used.

The data processing process is carried out in three stages, namely the normality test to determine whether the data is normally distributed or not. The paired sample t-test to determine whether there is a significant difference before and after the use of innovative diorama learning media in the subject of social studies on the subject of Indonesian cultural diversity. The last is the N-gain test to determine the increase in value before the media is used (pre-test) and after the media is used (post-test) and in this test it is also used to explain and determine the category of value increase as a result of student learning. After the research was conducted, the research data was obtained in the form of student learning outcomes in the subject of social studies on the subject of Indonesian cultural diversity.

Based on the results of the normality test with the Shapiro Wilk formula, the results of the small group normality test obtained a pre-test significance of 0.77 and a post-test of 0.91. This shows that t count> 0.05, so that the data on the results of the IPA learning outcomes of the material on the diversity of Indonesian culture in the small group are normally distributed. The results of the large group normality test obtained a pre-test significance of 2.76 and a post-test of 0.71. This shows that t count> 0.05, so that the data on the results of the IPA learning outcomes of the material on the diversity of Indonesian culture in the large group are normally distributed. Furthermore, for the homogeneity test, it was found that the data on the results of the IPA learning outcomes of the material on the diversity of Indonesian culture in the small and large groups were homogeneous. Furthermore, a t-test was carried out.

Based on the results of the paired sample t-test, it was obtained that the small group had a significance value of 0.03 <0.05 and the large group had a significance value of 0.00 <0.05 so that there was a significant difference in the small group and the large group after the pre-test and post-test were carried out. The results of the small group t-test are presented in Table 3. The results of the large group t-test are presented in Table 4.

**Table 3.** The Results of The Small Group Paired Sample T-Test

| | | Shapiro Wilk | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | Significance | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | t | df | One-sided p | Two-sided p |
| Pair 1 | IPAS - IPAS | -32.000 | 14.966 | 6.110 | -47.706 | -16.293 | -5.237 | 5 | 0.002 | 0.003 |

**Table 4.** The Results of The Large Group Paired Sample T-Test

| | | Shapiro Wilk | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | Significance | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | t | df | One-sided p | Two-sided p |
| Pair 1 | IPAS - IPAS | -29.684 | 12.741 | 2.923 | -35.825 | -23.543 | -10.155 | 18 | <0.001 | <0.001 |

Students in large groups with the help of innovative diorama learning media obtained an average learning outcome of 70. While in small groups with the help of innovative diorama learning media obtained an average learning outcome of 88. The data shows that the average learning outcome of social studies on the material of Indonesian cultural diversity in small groups is greater than the average of large groups. Based on the results of the N-gain test to determine the average value of students' social studies learning outcomes on the material of Indonesian cultural diversity, it can also be concluded that the average learning outcome of large groups is in the medium category and the average learning outcome of small groups is in the high category. The results of the small group n-gain test are presented in Table 5. The results of the large group n-gain test are presented in Table 6.

**Table 5.** The Small Group N-Gain Test Results Table

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Gain Score | 6 | 0.60 | 1.00 | 0.8848 | 0.16044 |
| Gain Percent | 6 | 60.00 | 100.00 | 88.4848 | 16.044042 |
| Valid N (Listwise) | 6 | | | | |

**Table 6.** Table of Results of Large Group N-Gain Test

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Gain Score | 19 | 0.33 | 1.00 | 0.7098 | 0.19003 |
| Gain Percent | 19 | 33.33 | 100.00 | 70.9844 | 19.00314 |

**Discussions**

The results of the data analysis show that innovative diorama learning media has received a very decent qualification from experts. This is due to the following factors. First, innovative diorama learning media is able to improve student learning outcomes in the subject of science, material on the diversity of Indonesian culture. Diorama is a three-

dimensional learning media so it is effective in improving students' understanding of learning materials (Ainurrahmah & Erwin, 2022; Pratiwi, 2022).In addition, dioramas can also make it easier for students to understand the concept of the material being studied, so that it has an impact on learning outcomes. Diorama media can help teachers make it easier for students to learn because they involve children in the process of making it (Budiani et al., 2023; Kustadiyono, 2020).Dioramas can also overcome the limitations of audio or visual media alone, because this media will produce images and sound. In addition, diorama media can also be used to improve skills in elementary school students (Ainurrahmah & Erwin, 2022; Santhi et al., 2020).

Second, innovative diorama learning media is also effective to use in learning activities. This is because innovative diorama media is able to make students play an active role in learning activities and is able to improve student learning outcomes (Ainurrahmah & Erwin, 2022; Pratiwi, 2022). In addition, with innovative diorama media in the form of concrete objects, students are able to observe a learning object clearly and easily. In learning activities, teachers must prepare learning objectives and materials to be studied that are adjusted to student characteristics (Rahim et al., 2020; Suryawan et al., 2021).After compiling the learning objectives, the teacher must make a plan on how to use diorama media in the learning process. After the media has been developed, the teacher applies the diorama media. The learning activities carried out include explaining learning materials using diorama media, explaining concepts that are in accordance with diorama media, and helping students understand the learning materials. At the end of the learning activities, the teacher evaluates the success of using diorama media in the learning process. This aims to assess students' ability to understand learning materials, as well as assess whether the media is successful (Argarini & Sulistyorini, 2018; Melindawati et al., 2021).Learning activities like this certainly have a positive impact on students.

Third, innovative diorama learning media increases students' enthusiasm for learning. The developed diorama media takes into account factors such as being in accordance with learning objectives, student characteristics, and the material being studied. This is what causes innovative diorama learning media to increase students' enthusiasm for learning (Ainurrahmah & Erwin, 2022; Pratiwi, 2022). In addition, diorama media can be used anywhere with the equipment available around it so that learning activities become easy. Diorama media must be able to provide students with a common experience of events in their environment, and allow for direct interaction with teachers, the community, and their environment (Kustadiyono, 2020; Sapitri et al., 2021).Diorama media must be able to increase students' interest in learning higher than the same media repeatedly and seem monotonous. By considering these factors, teachers can use effective and efficient learning media in improving student learning outcomes (Budiani et al., 2023; Kustadiyono, 2020).

Previous research findings also revealed that diorama media is effective for use in learning (Ainurrahmah & Erwin, 2022; Wardoyo et al., 2022).Other findings also revealed that diorama learning media can make it easier for students to learn (Aris & Afina, 2022; Pratiwi, 2022).It is concluded that the implementation of dioramas is able to make students play an active role in learning activities and is able to create an educational and enjoyable learning atmosphere. The advantages of this media are that this diorama media has the advantage of providing direct experience and can show objects in their entirety, making it easier for students to learn (Santhi et al., 2020; Sidyawati et al., 2021).Innovative diorama in the form of concrete object media equipped with learning videos through barcodes makes it easier for students to understand the learning material. The limitation of this study is that the diorama learning media developed is only for science learning on cultural diversity material in three provinces on the island of Java. The implication of this study is that innovative diorama learning media in science subjects can make it easier for students to learn science.

## 4. CONCLUSION

The results of the data analysis show that innovative diorama learning media is feasible to be used in learning activities. Diorama media is feasible to be used as evidenced by the increase in student learning outcomes which can be seen from significant differences. It is concluded that the use of innovative diorama learning media has a positive influence on student learning outcomes in the subject of science, material on Indonesian cultural diversity, grade IV of Ngaliyan 05 Elementary School, Semarang City.

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