Development of Quartet Card Media on Changes of State of Matter Materials in Class IV of State Elementary School 34 Banyuasin III

Nila Sari [1], Yusni Arni [2], Patricia Hotma Minar Lubis [3*]

[1,2] Pendidikan Guru Sekolah Dasar, Universitas PGRI Palembang, Indonesi
[3] Pendidikan Fisika, Universitas PGRI Palembang, Indonesia
patricialubis@univpgri-palembang.ac.id
corresponding author: patricialubis@univpgri-palembang.ac.id

ABSTRACT

This paper presents research on the development of learning media in the form of cards, aiming to create a set of cards learning media that can be tested for validity and practicality in learning. This research is a developmental study (Research and Development) utilising the Robert G. March model, specifically the ADDIE (Analysis, Design, Development, Implementation, Evaluation) framework, employing data collection techniques in the form of questionnaires and documentation. Based on the research results, the quartet card learning media is declared valid and tested to be efficient by the three validators, with the results of 82% media expert validation, 86% material expert validation, and 82% language expert validation, with a very valid category. The practicality trial indicates the one-to-one trial with 84.5% with a very feasible category, the small group trial with 86.3% with a very feasible category, and the last practicality trial refers to the real class with an average of 85% with a very feasible category. Therefore, the quartet card media is very feasible to use.

Keywords: quartet card, changes of state of matter media, elementary school

INTRODUCTION

Education is important and a pillar in building human resources. Education is a necessity for every human being because with education a person can gain knowledge and science. According to Sanga and Wangdra (Sanga & Wangdra, 2023, p.84) quality human resources are certainly based on educational values instilled in society. Education is learning knowledge that is carried out throughout life in all places and situations. Another opinion states that education is a conscious and planned effort to realize a cultural heritage from one generation to the next (Rahman et al., 2022, p.2). Education is also interpreted as a conscious effort carried out by a person continuously in order to communicate and interact with the environment in order to be able to dignity and humanize humans through cognitive, affective, and psychomotor aspects (Syakuroh, Ayu, & Lubis, 2022, p.18).

Education in Indonesia according to the opening of the 1945 Constitution paragraph 4 and Law No. 20 of 2003 concerning the Indonesian National Education System, which states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble morals, and the skills needed by themselves, society, nation and state. This is the goal of education in Indonesia, to achieve this goal, a learning process is needed that can attract students' interest in participating in learning. In education, a learning process is needed to achieve goals. The learning process is an activity related to educators and students, namely educators are tasked with teaching and students are tasked with learning (Alfina, Fakhrudin, & Lubis, 2023, P.759). The learning process can be carried out through subjects, one of which is science learning.

Natural science is known as science, science comes from the languageLatin, namely Scientia, which means "I know". Science is one of the lessons taught comprehensively in Elementary Schools. According to Hikmah, Kuswidyanarko and Lubis (Hikmah, Kuswidyanarko & Lubis., 2020, p. 138) science learning is a lesson related to natural sciences and forms students' scientific attitudes that are structured based on principles, concepts and systematic facts that can be proven through experiments and investigations. Science learning can introduce students to the surrounding environment and all its contents, through various activities carried out by students in learning activities (Lusidawaty et al., 2020, p. 169).

Science learning needs to be linked to everyday life because science learning is abstract, so in order to be more concrete or real, it is necessary to utilize interesting learning media that support the science learning process (Isnaini, Krisnawati & Mandasari, 2024, p.140).) . Most students think that science learning is still difficult because some materials are abstract and understanding while the characteristics of elementary school students are always related to real things (Rosada, Fakhrudin, & Lubis, 2023, p.391). From the explanation, it can be concluded that science learning is closely related to everyday life, so as educators, it is necessary to provide real understanding to children.

In Piaget's learning theory, children are statedages 6-11 years experience important and fundamental changes such as changes from less logical thinking to more logical thinking, this is marked by children's thinking starting to be based on concrete or real things (Marmaini, 2021, p.22). Based on this explanation, it shows that children will easily accept material if there are real objects or can be seen, seeing this, teachers can use media, especially visual-based media, which can provide direct experience to students so as to facilitate understanding and strengthen students' memory in science learning as a solution to replace concrete objects in the classroom.

The use of learning media for the learning process provides good things, especially during the learning process where students can generate new desires and interests in learning. Learning media itself is a tool used to help the learning process to be more effective and optimal (Fadilah et al., 2023, p.4). Learning Media is also an important component that functions as a toolaids that make it easier for educators to deliver material (Fatimah, Fuadiah, & Lubis, 2024, p.195). In addition, the use of media in learning can help students find and manage the knowledge they get independently. According to Hanannika and Sukartono (Hanannika & Sukartono, 2022, p.6380), learning media is a useful tool for teachers in helping students understand a concept when learning.

This is in line with the results of observations carried out at SD Negeri 34 Banyuasin III, problems were found, namely the lack of interest and enthusiasm of students during the learning process, learning is more centered on the teacher (teacher center), lack of use of interesting and interactive media, teachers focus on the use of textbooks when delivering material, especially in science learning, there is no use of media, one of which is in the material on changes in the state of objects. To support the success of student learning, teachers must be creative, innovative and able to develop learning media such as developing quartet card media

The quartet card media itself is thick paper in groups of four consisting of several cards with pictures and descriptions (Ismail, Taufiq & Hasanah., 2020, p.237). Quartet cards are also a game that pairs 4 cards as one pair and the quartet card media consists of themes, sub-themes, pictures and descriptions. Quartet card media is packaged in a fun game and has advantages such as attracting attention which will make students active in learning activities and also the use of quartet cards does not require supporting tools so that both teachers and students can use it easily.

Some previous studies that are used as references for this study are studies conducted by Giwangsa (Giwangsa, 2021) on the development of quartet card media in elementary school social studies learning. From the results of this study, it was stated that the quartet card was very feasible based on the results of the validation of media experts, material experts and student responses with a percentage score of 90%. Furthermore, research was conducted by Damayanti, Enawaty and Masriani (Damayanti, Enawaty & Masriani., 2021) with the title development of a quartet card game on acid, base and salt material. The results

of the study showed that the quartet card game developed was feasible for use in learning based on aspects of language feasibility 100% (very feasible), media 100% (very feasible), and material 91.66% (very feasible) and teacher response of 81.23% to the quartet card game. Based on the description above, it can be concluded that developing media in the form of quartet cards is one of the efforts to solve existing problems. Quartet cards are media that can help the learning process to increase students' interest and understanding so that learning objectives are achieved.

Media is one of the components of communication, namely as a message carrier from the communicator to the message recipient.(Daryanto, 2016, p.5). Learning Media is a media that can support the learning process in the school environment or outside of school, so that it can be a tool for conveying information from educators to students or vice versa so that learning objectives are achieved and make it easier for students to learn.(Yanti, Anggraini, & Darwanto 2019, p.202).The role of learning media in the learning and teaching process is an integral part of the world of education(Dewi, Riyanti & Lubis, 2023, p.210).

Card media is a simple media that can be used by educators for the learning process.(Suhana, Mulyadi, & Rahman, 2024, p.4448)Card media is a small media that can include images, descriptions or symbols that aim to remind or guide students related to the material being studied. Quartet cards are a form of picture card game that can be seen directly, is very informative and can be seen repeatedly so that students can more easily understand the material.(Damayanti, Enawaty, & Masriani, 2021, p. 171)

METHOD

This research involves the development of a product prototype before it is implemented. The product produced in this development research is a quartet card media for grade IV at SD Negeri 34 Banyuasin III. Research and development uses the ADDIE development model which is a process of product development and validation in the form of quartet card media in learning Changes in the Form of Objects in Grade IV by following the procedural steps and explanations, namely the stages of analysis, design, development, implementation, and evaluation.

The data collection techniques used in this study are documentation and questionnaires. Meanwhile, the prototype validation technique in this study was given to expert validators to determine the validity of the media developed, while the practicality of the product was given to students. As well as data analysis techniques are activities carried out to process data that has been obtained from respondents, data analysis techniques are carried out to obtain good quartet card learning media and meet the criteria for validity and practicality.

RESULTS AND DISCUSSION

This research was conducted at SD Negeri 34 Banyuasin III located on Jl. Lubuk Saung, Pangkalan Balai, Kec. Banyuasin III, Kab. Banyuasin, South Sumatra. The research design used in the study is Research and Development or known as Research and Development (R & D). This research produces learning media in the form of quartet cards, this type of research is research and development. The quartet card media developed uses the ADDIE research model consisting of the stages of Analysis, Design, Development, Implementation, and Evaluation.

1. Analysis Stage

The analysis stage is the initial stage carried out in this research, this analysis stage can show the basis of research to develop products. In this research there are several analyzes carried out including needs analysis and curriculum analysis.

Needs Analysis

From the observation results, it was found that students were still less active in participating in classroom learning, learning that was still focused on teachers and assignments and the use of media used was still limited to textbooks and the lack of use of media for science learning on one of the materials on changes in the state of objects. Based on the problems found, the solution that can be applied is to develop quartet card

media that can attract students' interest in participating in the learning process, make students directly involved in the learning process, provide experience to students, namely learning while playing and developing quartet card media that is easy for students to use.

Curriculum Analysis

To find out the curriculum used in SD Negeri 34 Banyuasin III, a curriculum analysis was conducted. The curriculum used in SD Negeri 34 Banyuasin III is an independent curriculum that requires teachers to be creative and innovative in using learning methods and active involvement of students in the learning process.

2. Design Stage

In this second stage, the researcher pours out detailed ideas for the product to be developed. This stage designs the beginning of the product design to be developed, here are some stages that are carried out can be seen below:

Preparation of Materials

The development of quartet card media in this study will use the material of changes in the form of objects in grade 4. At this stage, the researcher compiles the material before developing a media product. This stage is carried out to make it easier to determine the contents of the product to be developed and the contents of the material in the quartet card media are adjusted to the learning achievements and learning objectives. After the material has been designed, the researcher carries out the next stage, namely the stage of making the initial design of the quartet card media.

Initial Design or Prototype Creation

At the stage of designing the quartet card media using the Canva application, the aim is to create a display design for the procedure for using the quartet card, the front design of the quartet card and the back design of the quartet card containing the theme, sub-theme, image and description. After the quartet card media has been designed, the quartet card media is printed using art carton paper and laminated glossy.

3. Development Stage

This stage is carried out validation by experts using a prototype or initial design that has been made after the first validation is carried out, improvements or suggestions are made if there are any from the experts on the product being developed, then validation is carried out again with the experts after the media product is improved. The next step is for the research to distribute questionnaires to experts. Validation tests are carried out by media experts, material experts and language experts. The purpose of conducting product validator tests is to determine the validity and quality of the product being developed and can be continued to the next stage. The following are some of the validity test processes that researchers carry out in this development stage:

Expert Validation

The validation process in the quartet card media development research was carried out from April 22-April 27, 2025. The following are the results of the validation of media experts, material experts and language experts. Can be seen as follows:

1. Media Validation

Media expert validation was carried out to test the feasibility of the media developed, namely a quartet card on the material on changes in the form of objects from a design aspect., the attractiveness of the media presented and the use of media. The results of the media expert validator that have been carried out after the improvements can be seen in the table below:

Table 1. Media Expert Validation Results

No.	Indicator	Validators		
	Media	**1**	**2**	**3**
1.	Is the quartet card design attractive?	5	3	4
2.	Is the color selection attractive?	5	4	4
3.	Is the selection of letters and images appropriate?	4	4	4
4.	Is the image placement appropriate?	4	4	5
5.	Is the use of letters, spacing and typing consistent?	4	4	3
6.	Is the writing and typing clear?	5	4	4
7.	Is the use of letterforms for titles, subtitles, and content appropriate?	5	3	4
8.	Is the font size of the quartet card appropriate?	4	4	4
9.	Are the instructions for using the quartet card media clear?	4	4	4
10.	Is the quartet card format safe for students?	5	4	4
11.	Do quartet cards have long durability?	5	4	4
12.	Is it easy to use quartet cards in learning?	4	4	4
13.	Does the quartet card media make it easier for students to learn?	5	4	4
14.	Does the media attract students' attention and enthusiasm?	5	4	4
	Total Scores Obtained	64	54	56
	Validity Percentage	91%	77%	80%
	Average Total Percentage		82%	

Source: (Data processing, 2025)

From Table 1, we can see the scores obtained from the assessment given to the media aspects assessed by the three validators, namely obtaining results in the form of a percentage with an average total percentage of 82% with the criteria "very valid".

2. Material Validation

Material expert validation is carried out to test the feasibility or suitability of the material with the product developed in this study. The material used in the quartet card media is the change in the form of objects. The following results of the validation can be seen from the calculation below:

Table 2. Material Validation Results

No.	Indicator	Validators		
	Material	**1**	**2**	**3**
1.	Is the material in accordance with learning outcomes?	4	4	5
2.	Does the material match the learning objectives?	5	4	4
3.	Is the material presented clear?	4	4	5
4.	Does the image match the material?	5	4	5
5.	Is the material clear and systematically arranged?	5	4	4

No.	Indicator	V1	V2	V3
6.	Does the quartet card media increase students' knowledge?	4	4	5
7.	Is it relevant to the material studied by elementary school students?	5	4	5
8.	Can the presentation of material in the media help convey information to students?	4	4	5
9.	Does the material presented meet students' needs?	4	4	5
10.	Is the use of language easy to understand?	5	4	5
	Total Scores Obtained	46	40	48
	Validity Percentage	92%	80%	96%
	Average Total Percentage		89%	

Source: (Data processing, 2025)

From Table 2, it can be seen that the scores obtained from the assessment given by the material experts obtained results in the form of a percentage with an average total percentage of 89% with the criteria "very valid".

Based on the validation results from the material experts given by the three validators, the results were "very valid". This can be seen from the results of the questionnaire of ten questions. Questions from numbers 4, 7, and 10 are the questions that get the highest scores from the entire material questionnaire, thus showing strong validation results from the quartet card media on the material of changes in the form of objects. Question number 4 states that the images are in accordance with the material so that it can be concluded that the images in the quartet card media on the material of changes in the form of objects are in accordance with the material used, question number 7 states that the material presented in the quartet card media is relevant to the material studied by students at the elementary school level, and question number 10 states that the language used in explaining the material is easy to understand.

3. Language Validation

This language expert validation is carried out with the aim of knowing the feasibility or suitability of the language used in the quartet card media developed from the aspect of clear language use and is already understood in the use of the quartet card media. The results of the validation can be seen from the calculation below:

Table 3. Language Validation Results

No.	Indicator	Validators		
	Language	**1**	**2**	**3**
1.	Is the language used appropriate and correct?	4	4	5
2.	Does the use of words in the quartet card media not contain a double meaning?	5	4	5
3.	Is the language used clear and easy to understand?	4	4	5
4.	Is the font used clear and legible?	5	4	5
5.	Are the sentences presented concise, dense, clear and easy to understand?	4	4	5
6.	Is the language used integrated and ordered?	5	4	4
7.	Is the language used appropriate to the thinking level of fourth grade students?	4	4	4
8.	Is the use of language appropriate to the discussion material and images?	5	4	5

9.	Does the use of language in the quartet card media comply with Indonesian language rules?	4	4	5
	Total Scores Obtained	40	36	43
	Validity Percentage	88%	80%	95%
	Average Total Percentage		87%	

Source: (Data processing, 2025)

From Table 4.5, it can be seen that the scores obtained from the assessment given by the language expert obtained results in the form of a percentage with an average total percentage of 87% with the criteria "very valid". Based on the validation results from the three experts, it was found that the language validation had a "very valid" criterion. This can be seen from the nine questionnaire questions. Questions on questionnaires number 2, 4, and 8 received the highest or dominant scores so that they influenced the validation to get a very valid criterion. Question number 2 states that the use of words on the quartet card media does not contain double meanings so that it is easy to understand, question number 4 states that the type of font chosen is clear and easy to read, and question number 8 states that the use of language is in accordance with the discussion material so that it supports students' understanding of the material.

4. Implementation Stage

The implementation stage is a trial stage with grade IV students of SD Negeri 34 Banyuasin III, the implementation is carried out to see the practicality of the quartet card media when used during the learning process. In this implementation process there are 3 stages, namely the first stage is a trial*one to one*, the second stage was a trial on a small group and the last stage was the real trial, namely a large group test. The following are the results of the trial that the researcher conducted in class IV of SD Negeri 34 Banyuasin III below:

One to one trial

The results of the percentage of response questionnaires at the one-to-one trial stage that had been filled out by students produced the following results:

Table 4. One to one Trial Questionnaire Results

No.	Student Name	Total Score	Presentation	Category
1.	NSA	53	88%	Very Practical
2.	MF	49	81%	Very Practical
	Average		84.5%	Very Practical

Source (Data processing, 2025)

Based on the one-to-one trial, it is known that students gave a good response to the student response questionnaire in the application of quartet card media. According to these results, it can be stated that the product is in the "Very Practical" category so that there are no revisions and it can be applied to small group trials.

Small Group Trial

The results of the student response questionnaire assessment sheet at the small group stage of data acquisition can be seen as follows:

Table 5. Small Group Trial Questionnaire Results

No.	Student Name	Total Score	Presentation	Category
1.	AAA	52	86%	Very Practical
2.	AP	54	90%	Very Practical
3.	DAA	48	80%	Practical
4.	OR	53	88%	Very Practical
5.	RS	53	88%	Very Practical

6.	S	54	90%	Very Practical
7.	TW	50	83%	Very Practical
8.	AND	52	86%	Very Practical
Average			86.3%	Very Practical

Source: (Data processing, 2025)

Based on the results of table 5, it shows that the questionnaire given to students obtained a good score with the criteria of being very practical in the application of quartet card media with a percentage of 86.3%. It is concluded that in the application of the small group trial there was no revision so that the next stage could be carried out, namely a large group trial or field trial in all students of SD Negeri 34 Banyuasin III.

Large Group Trial

After the one-to-one and small group trial stages were carried out, the next stage was the quartet card media that had been developed was applied to a large group during the learning process in one class. This stage aims to see the practicality of implementing the product in the learning process through the quartet card learning media in science learning in class IV of SD Negeri 34 Banyuasin III.

Based on table 5, the results of the student response questionnaire in the large group trial of the quartet card media on the material of changes in the state of objects in grade IV obtained the highest result of 90% and the lowest score of 70% with the criteria of very practical and practical. While the average percentage value shows good results because the practicality value reaches the criteria in accordance with the provisions. The results of the student response questionnaire in the large group trial are expected to obtain a result of 85% with the criteria of "Very Practical".

Based on the results obtained from the large group trial regarding the development of quartet card media on the material of changes in the form of objects, it is known to get a good response to the media. Of the twelve statements presented in the form of a questionnaire, statements in numbers 4, 7, 10, 11 and 12 are statements that get the highest scores so that they affect the practicality of the large group trial.

5. **Evaluation Stage**

This evaluation stage is carried out at the final stage of the ADDIE model procedure. At this stage, the researcher sees the results of the validation process and the practicality of the trial that has been carried out with students at SD Negeri 34 Banyuasin III.The results of this evaluation were obtained from all suggestions and input from the validator which were used as a reference for improving the final product. After the final stages of product improvement had been carried out in accordance with the suggestions from the validator and filling out the validation questionnaire, and conducting a trial, filling out the student response questionnaire sheet, then the researcher conducted a data analysis aimed at determining the validity and practicality of the quartet card media on the material of changes in the state of objects for grade IV. After validation with experts, one-to-one trials, small group trials, and large group trials of the developed quartet card media were declared very valid and very practical. The evaluation process was carried out to determine whether the quartet card media on the material of changes in the state of objects could be applied in learning activities to increase the learning interest of grade IV students of SD Negeri 34 Banyuasin III.

The Analysis stage aims to identify problems in teaching and learning activities. This stage helps initial research in identifying problems found in SD Negeri 34 Banyuasin III, in this stage 2 analyzes are carried out, namely needs analysis and curriculum analysis. After analyzing the problems found in the elementary school being studied, the next step is to carry out the design stage, namely designing products according to the needs of students, what is done in this stage is determining the material and making the initial design of the quartet card media.

The next stage, the researcher carried out the development stage, namely the stage of validation with experts, then the researcher made revisions or improvements if there were improvements. Validation in this study was carried out with three experts, namely media experts, material experts and language experts so that

a valid product was obtained. The stage after product development is the implementation stage which is an activity to apply the product or media that has been developed, the implementation process is carried out with one-to-one trials, small group trials and large group trials.

The last stage in the ADDIE development model is Evaluation, at this stage data analysis is carried out to determine the validity and practicality of the product being developed. After each stage in the ADDIE development model was carried out, the results of the validation that had been carried out and the results of the practicality of the trial on students at SD Negeri 34 Banyuasin III were found.

The validation results were carried out with media experts, material experts and language experts with the aim of determining the quality of the product and as an assessment of the product being developed with the aim of determining the value and quality of the product or media being developed, whether it is worthy of being tested.

The results from media experts obtained a percentage of 82% which is included in the very valid criteria. Furthermore, the validation results from material experts obtained a percentage of 89% with very feasible criteria. The results of the validation test from language experts obtained results with a percentage of 82% entering the very feasible criteria. Based on the assessment criteria given by the experts, including 81-100%, it can be concluded that the quartet card media is feasible to use or very valid.

This is in line with relevant development research by Walidiati, Tahir & Rahmatih (2023) with the research title "Development of Quartet Card Media in Science Learning". The results of the study showed that the development of quartet cards using the ADDIE model obtained valid media results with a score from material experts of 93% and media experts of 98% with the category "very feasible"

Furthermore, research conducted by Anomeisa, Ernaningsih, Piterson & Safrudin (2024) entitled "Development of Quartet Cards as Learning Media in Integrated Algebra Material with Magepanda Local Wisdom". The results of this study indicate that the development of quartet card media with Magepanda local wisdom received validation results for feasibility from media experts with a very feasible category, reaching 88% and the results from material experts got a score of 87%. Thus, the development of quartet card media in integrated algebra material with local wisdom is said to be very feasible to use.

CONCLUSIONS AND RECOMMENDATION

Based on the results of the research that has been done, namely the development of quartet card media on the material of changes in the form of objects in class IV of SD Negeri 34 Banyuasin III, it can be concluded that the results and stages of development are to produce quartet card media on the material of changes in the form of objects in class IV. Quartet card media is designed using the Canva application and then printed with art carton paper and glossy laminating. The results of the validation of the experts obtained a percentage of 82% from media experts, 86% from material experts and 82% from language experts with a very valid category. Furthermore, for practicality, it gets a percentage value of 85% with a very practical category so that it can be stated that quartet card media can be used in the learning process at school.

REFERENCES

Alfina, I., Fakhrudin, A., & Lubis, P, H.(2023). Development of Problem based learning oriented learning modules for energy source material for grade IV *Elementary Schools. Scientific Journal of Elementary Education, 08*, 758–768.

Anomeisa, A. B., Ernaningsih, D., Piterson,R., & Safrudin, N. (2024). Development of quartet cards as learning media in integrated algebra material of magepanda local wisdom. 19(2), 312–323. https://doi.org/10.29408/edc.v19i2.27951

Damayanti, S,P., Enawaty, E., & Masriani, M. (2021). Development of quartet card game on acid, base and salt material. *VOX EDUKASI: Scientific Journal of Educational Sciences, 12*(2), 169–179. https://doi.org/10.31932/ve.v12i2.1250

Daryanto. (2016). Learning Media (2nd ed.). Yogyakarta: Gava Media Publisher.

Dewi, S,E., Riyanti, H., & Lubis, PH (2023). Development of Student Worksheets (LKPD) Based on Project Based Learning on Changes in the Form of Objects for Grade V Elementary School. Scientific Journal of Elementary Education, 08(September), 208–220.

Fadilah, A., Nurzakiyah, K,R.,, Kanya, N,A., Hidayat, S,P., & Setiawan, U. (2023). Understanding Media, Purpose, Function, Benefits and Urgency of Learning Media. Journal of Student Research (JSR), 1(2), 1–17.

Fatimah, S., Fuadiah, N,F., & Lubis, PH (2024). Development of Lunas (Ludo Natural Science) Learning Media on the Material of Relationships Between Living Things in Ecosystems for Grade V Elementary Schools. Jurnal Holistika, 7(2), 194. https://doi.org/10.24853/holistika.7.2.194-203

Giwangsa, S,F. (2021). Development of Quartet Card Media in Elementary School Social Studies Learning. Pedagogy: Journal of Educational Research, 8(1), 40–48. https://doi.org/10.25134/pedagogi.v8i1.3992

Hanannika, L,K., & Sukartono, S. (2022). Implementation of ICT-Based Learning Media in Thematic Learning in Elementary Schools. Basicedu Journal, 6(4), 6379–6386. https://doi.org/10.31004/basicedu.v6i4.3269

Hikmah, N., Kuswidyanarko, A., & Lubis, P, H. (2020). Development of Pop-Up Book Media on Water Cycle Material in Class V of SD Negeri 04 Puding Besar. Scientific Journal of Elementary School Teacher Education, 15(2), 137–148.

Ismail, I., Uyuni T, A., & Hasanah, U. (2020). Development of Quartet Cards as a Media for Learning Biology. Al Asma: Journal of Islamic Education, 2(2), 236. https://doi.org/10.24252/asma.v2i2.17084

Lusidawaty, V., Fitria, Y., Miaz, Y., & Zikri, A., (2020). Science Learning with Inquiry Learning Strategy to Improve Science Process Skills and Students' Learning Motivation in Elementary Schools. Basicedu Journal, 4(1), 168–174. https://doi.org/10.31004/basicedu.v4i1.333

Marmaini. (2021). Elementary Science Learning (Tri Septiana Kebela, ed.). Palembang: NoerFikri Palembang.

Rahman, A., Munandar, S,A., Fitriani, A., Karlina, Y., & Yumriani. (2022). Definition of Education, Educational Science and Elements of Education. Al Urwatul Wutsqa: Islamic Education Studies, 2(1), 1–8.

Rosada, M., Fakhrudin, A., & Lubis, PH (2023). Development of Comic-Based Teaching Materials Oriented to the Contextual Teaching and Learning (CTL) Approach for Science Learning for Grade V Elementary School. Pendas: Scientific Journal of Elementary Education, 08(September), 1–23.

Sanga, L,D., & Wangdra, Y. (2023). Education is a Determining Factor of National Competitiveness. Proceedings of the National Seminar on Social Sciences and Technology (SNISTEK), 5(September), 84–90. https://doi.org/10.33884/psnistek.v5i.8067

Suhana, R,A., Mulyadi, S., & Rahman, T. (2024). Utilization of card media as a learning medium for recognizing letters for early childhood. Journal of Education, 07, 4447–4452.

Syakuroh, K., Ayu, I,R., & Lubis, PH .. (2022). Development of LKPD Based on Guided Inquiry in Science Learning for Grade V Elementary School. Jurnal Sekolah PGSD Fip Unimed, 7(September), 18–25.

Walidiati, M., Tahir, M., & Rahmatih, A,H. (2023). Development of Quartet Card Media in Science Learning. 5(4).

Wulandari, A.,, Salsabila, A,A., Cahyani, K., Nurazizah, T,S., & Ulfiah, Z. (2023). The Importance of Learning Media in the Teaching and Learning Process. Journal on Education, 5(2), 3928–3936. https://doi.org/10.31004/joe.v5i2.1074

Yanti, C,O,D., Anggraini, F., & Darwanto. (2019). Interactive Mathematics Learning Media in an Effort to Develop Student Character. Semnasfip, 201–206. Retrieved from https://jurnal.umj.ac.id/index.php/SEMNASFIP/article/view/5128