

DEVELOPMENT OF QUARTET QR CODE CARD LEARNING MEDIA TO IMPROVE SOCIAL SCIENCE LEARNING OUTCOMES FOR GRADE V ELEMENTARY SCHOOL

Berlian Nazzatul Ghonia^{1*}, Galih Mahardika Christian Putra²

^{1,2} Universitas Negeri Semarang

¹berlianna219@gmail.com

Abstract

IPAS is one of the transformations of SD / MI subjects in the Merdeka Curriculum, which is expected to increase the potential and learning ability of students in the 21st century. In fact, the use of technology-based media by teachers is still not optimal, causing low student learning outcomes. This study aims to determine the design, feasibility and effectiveness of developing QR Code Quartet Card learning media. This research was conducted in the fifth grade of Wonosari 2 State Elementary School with a development design. This research model is ADDIE with a total population of 27 students. The sample technique used is stratified random sampling which is used to select samples with a stratified population obtained by 7 students. The data collection techniques used are observation, interviews, questionnaires and tests. The results of the media statistical test fulfill the feasibility aspects, namely the media expert assessment obtained 100% (very feasible), the material expert assessment obtained 80.9% (very feasible). In addition, it was found that the average increase in learning outcomes from the pretest of 49.5 to 82.75 in the posttest fulfilled the effectiveness aspect as evidenced by the paired t-test obtained a significance result of $0.00 < 0.05$ so that H_0 was rejected and H_a was accepted, the N-Gain test got an average of 0.65 which was included in the medium category and in percent as much as 65.16% so that the interpretation was included in the moderately effective category. Therefore, this media development fulfills the feasibility and effectiveness aspects.

Keywords: kwarant card; learning outcomes; IPAS

Abstrak

IPAS merupakan salah satu transformasi mata pelajaran SD/MI dalam Kurikulum Merdeka diharapkan dapat meningkatkan potensi dan kemampuan belajar peserta didik di abad 21. Pada kenyataannya, penggunaan media berbasis teknologi oleh guru masih kurang maksimal sehingga menyebabkan hasil belajar peserta didik rendah. Penelitian ini bertujuan untuk mengetahui desain, kelayakan dan efektivitas pengembangan media pembelajaran Kartu Kwartet QR Code. Penelitian ini dilakukan pada kelas V SD Negeri Wonosari 2 dengan desain pengembangan. Model penelitian ini adalah ADDIE dengan jumlah popuasi sebanyak 27 peserta didik. Teknik sampel yang digunakan adalah *stratified random sampling* yang digunakan untuk memilih sampel dengan populasi berstrata yang didapat 7 peserta didik. Teknik pengumpulan data yang digunakan adalah observasi, wawancara, kuesioner dan tes. Hasil uji statistik media memenuhi aspek kelayakan yaitu penilaian ahli media didapat 100% (sangat layak), penilaian ahli materi didapat 80,9% (sangat layak). Selain itu didapati peningkatan rata-rata hasil belajar *pretest* 49,5 menjadi 82,75 dalam *posttest* yang memenuhi aspek keefektifan dibuktikan dengan uji t-test berpasangan didapat hasil signifikansi $0,00 < 0,05$ sehingga H_0 ditolak dan H_a diterima, Uji N-Gain mendapat rata-rata 0,65 yang termasuk dalam kategori sedang dan dalam persen sebanyak 65,16% sehingga tafsiran termasuk dalam kategori cukup efektif. Oleh karena itu, pengembangan media ini memenuhi aspek kelayakan dan keefektifan.

Kata Kunci: kartu kwaret; hasil belajar; IPAS

Received : 2024-06-15

Approved : 2024-07-15

Revised : 2024-06-21

Published : 2024-07-31



Jurnal Cakrawala Pendas is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Introduction

Education is a tool to develop individual potential. In society, education has a crucial role as a capital to build an excellent (Ikrima et al., 2022). Good learning quality depends on the learning process (Jihan Nabilah et al., 63:2023). Over time, education has also undergone various changes. 21st century educational changes demand an increase in the quality of human resources (Muliawati & Norra, 2021:1). The transformation of 21st century education occurs because of the demands of 21st century skills as well. This is in line with Siregar's opinion (114:2023) that teachers must have the skills to use school infrastructure in accordance with the times. 21st century education not only requires teachers to master the material, but also the development of skills in accordance with the demands of the times. Learning conditions like this will make it easier for students to achieve 21st century skills. However, the success of the process is highly dependent on the curriculum as the basic guideline for education.

The curriculum makes it easier for students and educators to understand the education system that is implemented. This is in line with the opinion of (Lestari et al. 2023: 738) that through education, the younger generation is prepared to face future challenges and become quality citizens. Therefore, the curriculum is very important in education. This curriculum contains guidelines for formulating goals, content, materials, and how to apply them (Kharisma et al., (2024: 396). The curriculum provides direction in learning so that it is more effective in increasing the ability of students. The curriculum is an important aspect of formal learning (Alpian, 2022: 25) reveals that the Merdeka Curriculum is expected to help students develop their potential and prepare themselves to enter society. Therefore, in its implementation, the Merdeka Curriculum focuses on improving critical thinking, collaboration, communication, and digital skills.

IPAS as one of the subjects in SD / MI, IPAS is a subject that maximizes the potential and learning ability of students in the 21st century. There are Graduate Competency Standards (SKL) that must be met in 21st century SD learning, one of which is 4C skills. IPAS helps develop critical thinking skills in dealing with complex problems. Through projects, PAS also helps learners improve creativity, communication and collaboration so that they have the skills to face future challenges. 4C skills are needed to prepare for the 4.0 era (Putri et al., 2024: 207). Ariyana et al. (2018: 16) that 4C skills contain critical thinking, creativity, communication and collaboration. Meanwhile, in the intracurricular context there are CP or Learning Outcomes.

Learning in its implementation, there are still many challenges to be faced, especially in the use of school digital devices (Saputra et al., 2023: 668). Learning media of various types is also one of the impacts of the development of science and technology (Taufik et al., 2022). Teachers tend to lack competence in using digital devices and schools do not have infrastructure that supports the use of digital devices. The vast and abstract scope of learning makes it difficult for students to understand the material. Therefore, teachers as facilitators in learning have an important role if they want learning itself. Teachers must have competency standards including good mastery of material, as well as delivering material that is easily understood by students, one of which is the use of technology-based media. The use of digital media provides flexibility to learners and teachers, so that learning can be accessed independently and remotely.

Researchers conducted field observations to find out whether the implementation of the learning process at SD Negeri Wonosari 2 was in accordance with ideal conditions.

Furthermore, interviews were conducted to find out the curriculum, learning process, methods, models, materials, media and learning evaluation. In reality that occurs in the field, it is known that several problems arise in learning in the content of IPAS, including (1) Often students use printed books as a learning resource so that the use of learning media by teachers is less than optimal. (2) The use of digital media in learning is generally only in the form of PPT and videos. (3) Low learning outcomes in IPAS learning. Teachers are expected to use learning media to encourage students to be smarter and more active (Surahman et al. 2022: 63). Providing appropriate learning media can help achieve an active learning process (Audia et al., 2021:1). Problems in learning need to be resolved immediately so that changes in individual behavior occur (Ariani, et al., 2022: 64). It is feared that the lack of optimal use of learning media in IPAS learning can affect student learning outcomes. Meanwhile, learning outcomes are important in achieving predetermined competency standards (Zuriyati, 2022: 13).

Seeing from the problems that occur, making students have difficulty in understanding learning materials, especially in social studies learning. This is evidenced by the learning results of the previous batch of students' daily tests which were still low and below the KKM. Of the total 26 students in class VB of SD Negeri Wonosari 2 consisting of 12 female students and 14 male students, it is known that there are 5 (19.24%) students who score below the KKM. While 21 (80.76%) other students scored above the KKM. The five students need to be given treatment so that their learning outcomes can reach the KKM.

Researchers spread the questionnaire needs of teachers and students as a follow-up to the problems that occur. Based on the teacher needs questionnaire, there is a need for the development of concrete learning media on the content of IPAS, especially social studies lessons, simply social studies examines society in an integrated manner. Social studies is a lesson whose presentation is a simplified form of human activities and social science disciplines (Ningsih & Gunansyah, 2023: 858). In the questionnaire the needs of students known that most students have difficulty in understanding social studies learning materials. Media in achieving learning objectives is a message intermediary (Prasetyaningtyas, 2020:110). The achievement of learning objectives depends on the type of learning resources or media chosen (Sumartono, 2022: 154). Selection of media that is appropriate to the learning material is important to increase interest in learning so that learning objectives can be achieved (Latifah et al., 2020). The use of learning media that is less interactive makes students feel bored quickly when learning takes place. Students also prefer digital-based learning assisted by smartphones and laptops. Based on the problems that occur, researchers underline that the low student learning outcomes in the IPAS content are caused by several factors including the use of less attractive printed book learning media. Based on these problems, researchers found a solution that can overcome the problem of low learning outcomes in IPAS learning, namely through the development of QR Code quartet card learning media that utilizes science and technology.

The use of technology in learning media provides various benefits for students and teachers. The utilization of technology in education can provide benefits such as providing a more pleasant learning atmosphere. The implementation of this technology can be applied in the use of technology-based learning media packaged in games so that students are more interested and motivated to learn. The use of technology in learning media is also in line with the goals of the Merdeka Curriculum which develops 21st century skills. However, its use must be in accordance with teaching rules. When choosing the right type of media, teachers

need to consider goals, objectives, time, costs, and infrastructure availability. Saputra et al. (2023: 668) explain that the digital devices used are tailored to the needs and resources available in the field.

Quartet card learning media can be an option in implementing 21st century learning. This media contains abstract learning materials that can be packaged in a technology-based game, making it easier for children to understand. By using the quartet card game, students' knowledge can be improved and directed (Wilandika et al., 2022:342). The use of quartet cards in learning can be an alternative because in its implementation this card is packaged through educational games. In the scope of learning, quartet cards also help students to understand the learning material through interesting activities, so that students are motivated to learn. Game-based learning media also makes students actively involved in learning (Qolbyatin, 2023: 142). Technology in education can also help teachers create a student-centered learning environment (Slamet & Raharjo, 2024). Interesting learning media will increase student motivation and enthusiasm for learning (Firgiyana & Utomo, 2024: 347). Quartet cards are educational learning media so that students do not feel bored and foster interest in learning (Samsiyah et al., 2021: 120).

Media helps teachers communicate so that learning becomes more interesting, interactive and learning outcomes can improve (Hasan, et al., 2021: 5). Quartet cards are illustrated game cards accompanied by picture captions (Nurfila, et al., 2022: 288). Quartet cards are picture cards that in one theme consist of 4 subthemes that contain pictures, writings or combinations thereof. These cards provide depictions and explanations through interesting games. The advantages of this game are easy to carry, practical, easy to play and cheap. Quartet cards are efficient in limited space and time and can be used many times (Hantoro et al, 2022:24). Therefore, this media is suitable and effective to be applied at SD Negeri Wonosari 2 in social studies subjects.

Research that supports the solution of this research problem is research conducted by Sahira & Suryanti (2023) entitled "The Effectiveness of the Quartet Card Game Method on Learning Outcomes and Science Learning Activeness of Grade V Elementary Students". The results showed that the quartet card game method was effective. In student activity based on the results of student activity for each meeting in the experimental class and control class there is an increase in percentage. In addition, research conducted by Samsiyah et al., (2021) entitled "The Effectiveness of Quartet Cards on Students' Comprehension Ability in Social Studies Class IV Subjects". The results of his research are the effectiveness of quartet cards on students' comprehension skills in grade IV social studies subjects supported by the results of the effectiveness test with large effectiveness criteria, it can be stated that students who use quartet cards are more effective than students who use conventional learning.

The next research is from Giwangsa (2021) entitled "Development of Quartet Card Media in Social Studies Learning in Elementary Schools" with the results of research showing that this quartet card media is very feasible to use based on the results of expert assessments and student responses as a social studies learning media in elementary schools on cultural diversity material in Indonesia. This media makes it easy for students to be able to increase student learning motivation in learning social studies in elementary schools on the material of cultural diversity in Indonesia.

This research was conducted on IPAS learning that focuses on environmental change material. Researchers will develop learning media for kertu quartet games equipped with QR codes containing environmental change material in IPAS learning to improve the learning

outcomes of grade V students. Based on the existing description, researchers are interested in conducting research on "Development of QR Code Quartet Card Learning Media to Improve Learning Outcomes of Grade V Primary School IPAS Learning".

Research Methods

This research focuses on the development of QR Code quartet card media on environmental change material to improve the learning outcomes of fifth grade IPAS learning at Wonosari 2 State Elementary School. This research was conducted in the even semester of the 2023/2024 school year. The subjects of this study were 27 students of class VB SD N Wonosari 2 who were divided into 2 groups. The small group consisted of 7 learners selected using stratified random sampling technique consisting of 2 top-ranked learners, 3 middle-ranked learners and 2 lower-ranked learners used in small-scale trials. The large-scale trial used 20 learners outside the small group.

This research is an R&D research that develops a product using the ADDIE design model. Analyze, Design, Develop, Implement, and Evaluate (ADDIE) is a basic performance concept used to develop a product through semantic stages so that the product can be valid (Cahyadi in Qolbyatin, et al. 2023: 140). In learning, the ADDIE model can be used to design learning media development. There are several stages carried out in the ADDIE model. In its implementation, the ADDIE model will be used by researchers with a procedural approach to develop QR Code quartet card learning media starting from the analysis stage to evaluation.

The analysis stage is used to determine the possible causes of problems in learning. In this case, researchers conducted a needs analysis by means of observation, interviews and questionnaires. The results of this analysis stage are used to determine the needs, problems and potential of the school. The development stage will produce product designs and validate the feasibility of the products developed. Products that have been developed by researchers will be identified for feasibility by material expert validators and media expert validators. The implementation stage requires general learning procedures in the form of teaching modules. This stage aims to test the developed product directly, so that it is known whether there are things that need to be improved. The evaluation stage is used to assess the quality of the product. In this study, the QR Code quartet card will be assessed for effectiveness using the pretest and posttest learning outcomes of students with test instruments. The learning outcomes are then analyzed statistically to determine whether there is an average increase. Furthermore, teachers and students will be given a questionnaire to find out the response related to the implementation of the QR Code quartet card media. The five stages of ADDIE, if implemented appropriately, are expected to help improve learning outcomes through innovative and fun learning.

The data in this study consisted of qualitative data and quantitative data. Qualitative data includes data in the form of words, sentences or images. Qualitative data used in this study were obtained from non-test techniques, namely documentation, observation results, results of interviews with VB class teachers at Wonosari 2 State Elementary School, and questionnaires.

Sugiyono (2013: 7) explains that quantitative data includes data in the form of numbers, or graded data (scoring). Quantitative data used in this study were obtained from the results of the test technique in the form of learning outcomes of fifth grade students of Wonosari 2 State Elementary School in the IPAS content and the results of the pretest posttest on the IPAS learning content.

Data collection techniques and instruments in this study consisted of non-test techniques and test techniques. Non-test techniques include observation, interviews with class teachers, questionnaires/questionnaires of teacher and learner needs, media expert and material expert validation questionnaires, teacher and learner response questionnaires and documentation in the form of a list of names and number of VB class students, learning outcomes of related materials in previous classes, and photos of IPAS content learning.

Learning outcomes are used to measure how well students understand the teaching material packaged in a series of questions (Sappaile et al., 2021: 14). The test technique includes data on pretest and posttest learning outcomes of 20 multiple choice HOTS questions which are then compared to determine the improvement of students' cognitive abilities. Higher order thinking skills are expected to help students' development in solving complex problems (Meilani & Aiman, 2020: 39).

Data analysis was carried out statistically by conducting several tests, namely feasibility test, validity test, reliability test, level of difficulty, and differentiating power. The feasibility assessment of QR Code card media on IPAS subject matter was carried out by media expert validators and material experts using a questionnaire using a Likert scale. Furthermore, the feasibility assessment was also carried out by teachers and students through a questionnaire containing responses with a Likert scale as well. Sugiyono (2013: 94) explains that variables in the Likert scale are translated into variable indicators which become benchmarks for compiling checklist and multiple choice questions. The answers to these questions have gradations from very positive with score intervals of 5,4,3,2,1 to very negative with score intervals of 1,2,3,4,5 and then a percentage test of media feasibility is carried out. The results of the feasibility test by the expert are then used as an assessment to determine whether revisions need to be made or not based on the suggestions given by the expert. Meanwhile, the validity test was conducted to determine whether the evaluation questions used in the pretest and posttest were valid. Then the reliability test is carried out on a valid question to find out whether the question is reliable. Furthermore, the level of difficulty and differentiation of the questions were carried out to find questions that were suitable for use in the pretest and posttest.

Initial data analysis was carried out by analyzing the average pretest and posttest results of students. Before conducting further data processing, prnriliti conducted a normality test to determine the type of statistics to be used. The normality test is carried out to determine the distribution of pretest and posttest data so that researchers can find out which data processing techniques can be used. The data obtained in this study are the data from the pretest and posttest results of 20 multiple choice questions. In this study, the data was normally distributed using the Shapiro Wilk formula because the data amounted to less than 100. The results of the pretest and posttest normality test using the Shapiro Wilk test, H_0 is rejected if $\text{sig.} \leq \alpha 0,05$. Data is normally distributed if $\text{sig.} > \alpha 0.05$. The analysis results show that the pretest sig. value is 0.710 and the posttest sig. value is 0.213. Thus, the pretest and posttest results are normally distributed and meet the requirements for use in parametric statistical tests.

The final data analysis was conducted with paired T-Test and N-Gain test. The difference in the achievement of learning outcomes before and after the application of QR Code quartet card media is processed by a two-party paired T-Test test. After conducting the paired t-test, the next step is to calculate the average increase in pretest and posttest results using the N-Gain test.

Results and Discussion

The development of QR Code quartet card media products is carried out to determine the feasibility design and effectiveness of QR Code Quartet Card learning media development through 5 stages based on the ADDIE development model as follows.

Analysis Stage

Before researchers design a product, it is necessary to analyze the potential, problems, and needs that exist in the field. Media analysis was conducted through observations and interviews. The results of the interview found that the use of learning media in the fifth grade of Wonosari 2 State Elementary School in learning IPAS content was quite diverse but less interactive. Learning tends to use printed books and the use of technology only through PPT and video. The use of these media tends to be teacher-centered so that students are less active in learning. While the results of the needs analysis found that students prefer the use of concrete and technology-based learning media. The results of the observation found that there is potential in the school, namely students are allowed to bring smartphones and Wi-Fi networks are provided, so that the media design developed can utilize smartphones. The users of the product developed in this study are fifth grade students of Wonosari 2 State Elementary School. Fifth grade students are around 7 to 11 years old where they are at the concrete operational stage. At this stage they can analyze the logic of concrete objects, categorize objects and cannot yet solve abstract problems. Based on the abilities and characteristics of students, researchers developed QR Code quartet card media for IPAS lesson content on Environmental Change material.

Analysis of product design needs is carried out by providing a needs questionnaire to teachers and students. The appearance and operation of the developed media must be adapted to the characteristics of users so that students are interested in using the product and are motivated to learn. The results of the needs analysis show that most students agree with the development of QR Code quartet card media on IPAS material. The use of font type and size will be adjusted by researchers and use language that is in accordance with the cognitive and emotional abilities of students. The card design is equipped with illustrations related to the material and uses bright colors so that it is attractive.

Design Stage

The design stage begins with the preparation of learning materials in teaching modules based on the CP, TP and ATP that have been formulated. The material chosen is environmental changes due to natural factors and human activities. This material was chosen because there were misconceptions of students about related material. CP in this material is that students reflect on how changes in natural conditions on the earth's surface occur due to natural factors and human actions. Furthermore, researchers chose the QR Code quartet card media for environmental change material based on the needs of students and the potential of the school. This media utilizes smartphones carried by students to access the material in the QR Code.

Media design references based on previous research. The media design of the QR Code quartet card on Environmental Change material was developed using digital techniques using Canva software. Media design is done by determining the card size of 9x6.5 cm. After that, researchers designed the layout of elements in the media. Next, make the contents of the

material which is then presented with a barcode on the back of the card to access the material. QR Code creation with the help of the QR Code Generator application. QR Code scanning uses the help of smartphone devices carried by students. Then a product packaging design is made. This media has a barcode on the card packaging that contains the researcher's profile. Each package contains 8 sets of cards with different main titles. One set of cards contains 4 sheets of cards with the same title and different sub-title explanations. Then on the back of the card contains a different QR Code and contains material about related subtitles. In one package there are also 3 additional cards that contain QR codes for game instructions, overall material and practice questions.

Development Stage

QR Code quartet card media was developed after going through problem analysis, interviews and questionnaire analysis of teacher and learner needs. The development of QR Code quartet card media is based on several supporting references. The content of the material in the media is adjusted to the Learning Outcomes and Learning Objectives in Phase C of class V of the Merdeka Curriculum. In each media package, there are 32 main cards and 3 additional cards. The media that has been designed is then printed on 230 gsm artpaper.



Packaging
 Figure 1. QR Code Quartet Card Media Section

The media developed by researchers need to be assessed for feasibility before being used in field trials. Therefore, media validation was carried out by experts. In this case, the validation was carried out twice, namely by media experts and material experts. Each expert then provided comments and suggestions so that the media could be improved before it was suitable for use. The validation results are then used to assess whether the QR Code quartet card media is feasible to use. The results of the feasibility test by validators are as follows.

Table 1. Results of Feasibility Test by Expert Validators

Expert Validators	Aspect	Score	Kategori
Media	Media design	24	100% (very feasible)
	Usage	20	
	Typography	24	
	Strategi	16	
Material	Content eligibility	18	80,9% (highly suitable for field testing with revisions)
	Language feasibility	9	
	Feasibility of presentation	28	

The results of the feasibility assessment by expert validators are as follows (1) the percentage value of the media expert's response is 100% so that the QR Code quartet card media is included in the criteria very feasible to be tested in the field without revision. (2) The percentage value of the material expert's response is 80.9% so that the material in the QR Code quartet card media is included in the criteria very feasible to be tested in the field with revision. The revision in this development is on the teaching module TP and the addition of 1 additional card, namely the card containing the barcode of the entire material in the media.

Implementation Stage

The trial was conducted in two meetings on a small scale and large scale. The first meeting was given a pretest and the second meeting was given a posttest. The pretest and posttest questions consisted of 20 multiple choice questions. The questions have previously been tested for validity, reliability, difficulty level and differentiation so that valid questions are produced. The KKTP used is 70. The results of the small-scale trial are as follows.

Table 2: Small Scale Test Pretest Posttest Results

Action	Mean	KKTP	Lowest Score	Highest Score	Students who Passed	Graduation Percentage
Pretest	55	70	40	65	0	0%
Posttest	81	70	65	95	6	85,71%

The results of the small-scale trial by 7 students obtained an average pretest score of 55 with a student completeness presentation of 0%. While the average posttest of the small-scale test was 81 with a percentage of students who passed as much as 85.71%. While the results of the large-scale trial are as follows.

Table 3: Large Scale Test Pretest Posttest Results

Action	Mean	KKTP	Lowest Score	Highest Score	Students who Passed	Graduation Percentage
Pretest	9,5	70	35	65	0	0%
Posttest	1,75	70	60	95	18	90%

The large-scale trial was conducted with 20 learners excluding 7 learners who had participated in the small-scale trial. The average result of the large-scale trial pretest was 49.5 with 0% learning completeness, in other words, no students reached the KKTP. Meanwhile, the posttest obtained an average of 81.75 with a percentage of learning completeness of 90%. There were 18 students who reached KKTP.

Evaluation Stage

The results of the statistical tests carried out are as follows (1) paired t-test on the pretest and posttest obtained a significance result of $0.00 < 0.05$ so that H_0 is rejected and H_a is accepted. (2) N-Gain test on pretest and posttest to test the average increase in learning outcomes obtained an average of 0.65 which is included in the medium category and in percent of 65.16% so that the interpretation is included in the moderately effective category. (3) Teacher response questionnaire with a score of 83.69% and student response questionnaire with a result of 91.3% which is included in the very feasible category.

Table 4. Data Analysis Results

Test	Results	Conclusion
T-Test	0,00	The development of QR Code quartet card media on IPAS lesson content is feasible and effective to use to improve the learning outcomes of fifth grade students of Wonosari 2 State Elementary School.
N-Gain	65,16%	Quite effective
Teacher's response	83,69%	Very feasible
Student's response	91,3%	Very feasible

The results showed that the development of QR Code quartet card media is feasible to use in and useful for providing understanding for students about environmental change material. This media was developed to meet the needs of teachers and students in learning to improve student learning outcomes. This is evidenced by the increase in students' learning outcomes so as to increase students' knowledge in learning. However, there are weaknesses in the implementation of the use of QR Code quartet cards, namely the duration in learning which is quite short, thus reducing the maximum implementation of the media. In addition, the pretest and posttest evaluation questions used are the same, so the N-Gain results are included in the moderately effective category. Therefore, researchers provide suggestions for further research to adjust the duration of media use and the use of different pretest posttest questions so that the results of media effectiveness are maximized.

Conclusion

Based on the results of the research, the development of QR Code quartet card media produces media that is feasible and effective to use to increase student learning outcomes on the material of environmental changes in class V elementary school. The QR Code quartet card media is very feasible to be tested in the field with a percentage of the media expert's response value of 100%, the material expert gives a value with a percentage of 80.9% so that the material and QR Code quartet card media are included in the criteria very feasible to be tested in the field with revision. Based on the implementation of the media, the teacher's response is obtained with a value of 83.69% and a student response questionnaire with a value of 91.3% which is included in the very feasible category. The paired t-test test on the pretest and posttest obtained a significance result of $0.00 < 0.05$ so that H_0 was rejected and H_a was accepted. The N-Gain test on the pretest and posttest to test the average increase in learning outcomes obtained an average of 0.65 which was included in the moderate category and in a percentage of 65.16% so that the interpretation was included in the moderately effective category. However, there are weaknesses in the implementation of the use of QR Code quartet cards, namely the duration in learning which is quite short, so that the implementation of the media is less than optimal. In addition, the use of pretest and posttest questions in this study is the same, so that it affects the results of less than maximum effectiveness. Therefore, the development of this media will be more effective if improvements are made to the duration of use and the use of questions.

References

- Ariani, Masruruo, Saragih, Hasiban, Simamora, & Toni. (2022). Buku Ajar Belajar Dan Pembelajaran. In *Buku Ajar Belajar Dan Pembelajaran*. <https://doi.org/10.21070/2022/978-623-464-043-4>
- Ariyana, Y., Pudjiastuti, A., Bestary, R., & Zamroni. (2018). Buku Pegangan Pembelajaran Keterampilan Berpikir Tingkat Tinggi Berbasis Zonasi. *Buku Pegangan Pembelajaran Berorientasi Pada Keterampilan Berfikir Tingkat Tinggi*, 1–87. https://repositori.kemdikbud.go.id/11316/1/01._Buku_Pegangan_Pembelajaran_HOT_S_2018-2.pdf
- Audia, C., Yatri, I., Aslam, Mawani, S., & Zulherman. (2021). Development of Smart Card Media for Elementary Students. *Journal of Physics: Conference Series*, 1783(1). <https://doi.org/10.1088/1742-6596/1783/1/012114>
- Dita Ika Nurfila, Septriana, & Endri Yuliaty. (2022). Pengaruh Permainan Kartu Kuartet terhadap Pengetahuan tentang Sayur dan Buah pada Siswa Sekolah Dasar. *SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat*, 1(3), 287–293. <https://doi.org/10.55123/sehatmas.v1i3.619>
- Firgiyana, D., & Utomo, A. C. (2024). *Jurnal Cakrawala Pendas The Implementation Of Augmented Reality-Based Learning Media On Civics Subject To Increase Learning is able to prepare students to become citizens who are strongly committed and consistent in (Magdalena et al ., 2020) Civics Educ. 10(2), 346–358.*
- Giwangsa, S. F. (2021). Pengembangan Media Kartu Kuartet Pada Pembelajaran Ips Sekolah Dasar. *Pedagogi: Jurnal Penelitian Pendidikan*, 8(1), 40–48. <https://doi.org/10.25134/pedagogi.v8i1.3992>

- Hantoro, R. W., Hartini, S. H., Agungbudiprabowo, A. A., & Siswanti, R. S. (2022). Media Permainan Kartu Kwartet untuk Meningkatkan Pemahaman Karir Siswa SMK. *Advice: Jurnal Bimbingan Dan Konseling*, 4(1), 21. <https://doi.org/10.32585/advice.v4i1.2539>
- Hasan, Milawati, Darajat, Harahap, Tahrim, Anari, Rahmat, Masdiana, & Indra. (2021). Media Pembelajaran. In *Tahta Media Group*.
- Ikrima, Sapriya, Sundari, & Umar. (2022). Design Learning Media of Traditional Game Quartet Card for Elementary School History Figures in the Resistance to the Netherland. *International Conference on Elementary Education in the Future Challenge*, 213–223. <http://journal.unnes.ac.id/sju/index.php/elt>
- Jihan Nabilah, N., Dewina, Z., & Muhammadiyah Hamka, U. (2023). the Effect of Using Google Sites Media on the Learning Outcomes of Science and Technology Students in Grade V. *Jurnal Cakrawala Pendas*, 9(1), 61–69. <http://dx.doi.org/10.31949/jcp.v9i1.3713>
- Kharisma, A. I., MZ, A., & Putri, R. S. Y. (2024). Developing of Differentiated Natural and Social Science Learning Tools in Merdeka Curriculum in Elementary Schools. *Jurnal Cakrawala Pendas*, 10(2), 395–403. <https://ejournal.unma.ac.id/index.php/cp/article/view/8951><https://ejournal.unma.ac.id/index.php/cp/article/download/8951/4785>
- Latifah, S., Koderi, K., Fiteriani, I., Khoiruddin, & Diani, R. (2020). Development of Smart Physics Card as Physics Learning Media on Temperature and Heat Material. *Journal of Physics: Conference Series*, 1467(1). <https://doi.org/10.1088/1742-6596/1467/1/012033>
- Lestari, N. A. P., Wahyuni, L. T. S., Lasmawan, I. W., Suastra, I. W., Dewi, M. S. A., & Astuti, N. M. I. P. (2023). Kurikulum Merdeka Sebagai Inovasi Menjawab Tantangan Era Society 5.0 Di Sekolah Dasar. *Jurnal Ilmiah Pendidikan Citra Bakti*, 10(4), 736–746. <https://doi.org/10.38048/jipcb.v10i4.1996>
- Meilani, D., & Aiman, U. (2020). Implementasi Pembelajaran Abad 21 terhadap Hasil Belajar IPA Peserta Didik dengan Pengendalian Motivasi Belajar. *Indonesian Journal of Primary Education*, 4(1), 19–24. <https://doi.org/10.17509/ijpe.v4i1.24419>
- Muliawati, D. I., & Norra, B. I. (2021). The influence of quorted card and virtual laboratory media on students' critical thinking ability. *IOP Conference Series: Earth and Environmental Science*, 1796(1). <https://doi.org/10.1088/1742-6596/1796/1/012121>
- Ningsih, V. M., & Gunansyah, G. (2023). Pengembangan Media Pembelajaran Kartu Kuartet QR Code dalam Pembelajaran IPS Materi Peristiwa Kebangsaan Masa Penjajahan Kelas V Sekolah Dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 11(4), 858–867.
- Prasetyaningtyas, S. (2020). Penerapan Metode Permainan Kartu Kwartet Untuk Meningkatkan Prestasi Belajar Dan Keaktifan Belajar Pada Materi Klasifikasi Makhhluk Hidup Kelas VII SMP N 1 Semin. *Ideguru: Jurnal Karya Ilmiah Guru*. <https://doi.org/10.51169/ideguru.v5i1.118>
- Putri, S. A., Andhini, N. S., Putri, I. A., Yanthi, N., & ... (2024). Critical and Creative Thinking Skills in Elementary School Minimum Competency Assessment: Literacy and Numeracy. *Jurnal Cakrawala ...*, 10(2), 206–214. <https://www.ejournal.unma.ac.id/index.php/cp/article/view/8413><https://www.e>

journal.unma.ac.id/index.php/cp/article/download/8413/4763

- Qolbyatin, Septaria, & Wulandari. (2023). Quartet Learning Media and Student Argumentation: Development Analysis and Correlation in Science Learning in Junior High Schools. *INSECTA: Integrative Science Education and Teaching Activity Journal*, 4(2), 138–150. <https://doi.org/10.21154/insecta.v4i2.7012>
- Sahira, D. A., & Suryanti. (2023). pada Siswa Sekolah Dasar a. Membahas tentang kemampuan berpikir kritis b. Menggunakan pendekatan Realistic Mathematics Education Subjek penelitiannya yaitu kelas V. *Jpgsd*, 11(2).
- Samsiyah, S., Hermansyah, H., & Kuswidyanarko, A. (2021). Efektivitas Kartu Kuartet Terhadap Kemampuan Pemahaman Siswa Pada Mata Pelajaran Ips Kelas Iv. *Jurnal Holistika*, 5(2), 119. <https://doi.org/10.24853/holistika.5.2.119-126>
- Sappaile, B. I., Pristiwaluyo, T., & Deviana, I. (2021). *Hasil Belajar dari Perspektif Dukungan Orangtua dan Minat Belajar Siswa* (Issue February).
- Saputra, E., Wulan, R., & Ali, N. (2023). *Memanfaatkan Perangkat Digital Di SDIT Al Barkah Bekasi Penerapan Kurikulum Merdeka dengan memanfaatkan perangkat digital memerlukan pemahaman dan keterampilan yang mendalam dalam penggunaan teknologi Merdeka dapat memberikan manfaat besar dalam meningkat*. 06(06), 667–675.
- Slamet, A., & Raharjo, M. (2024). *Jurnal Cakrawala Pendas Development Of Interactive Multimedia For Clean Air For Breathing In The Context Of Climate*. 10(2).
- Strategi, J. I., Vol, M. P., & Tahun, A. (2022). *53 STRATEGY: Jurnal Inovasi Strategi dan Model Pembelajaran*. 2(2), 153–160.
- Sugiyono. (2013). Metode Penelitian Kualitatif dan R and D. In *Bandung: Alfabeta* (Vol. 3, Issue April).
- Supardi, U. . (2012). Kata kunci . *Kinabalu*, 11(2), 50–57.
- Surahman, F., Haidir, Dirneti, Erika, & Dianasari, E. L. (2022). Pengembangan Media Kartu Kwartet Tema 9 Subtema 1 dan Subtema 2 Kelas V Sekolah Dasar Swasta. *Jurnal Pendidikan MINDA*.
- Taufik, M. S., Ridlo, A. F., Solahuddin, S., Iskandar, T., & Taroreh, B. S. (2022). Application of YouTube-Based Virtual Blended Learning as a Learning Media for Fundamental Movement Skills in Elementary Schools during the Covid Pandemic 19. *Annals of Applied Sport Science*, 10(1), 1–10. <https://doi.org/10.52547/aassjournal.1020>
- Wilandika, A., Fatmawati, A., Farida, G., & Yusof, S. (2022). The Kasaba Quartet: The Impact of Card Games on Knowledge and Self-Efficacy HIV/AIDS Prevention. *Open Access Macedonian Journal of Medical Sciences*, 10, 341–348. <https://doi.org/10.3889/oamjms.2022.8681>
- Zuriyati, H. (2022). Upaya Peningkatan Hasil Belajar Peserta Didik Melalui Model Pembelajaran Probing-Prompting Pada Materi Sistem Gerak Kelas Xi Ipa The Improvement Effort Of Student Learning Outcomes Through Probing-Prompting Learning Models On Motion System Material In Ele. *Cahaya Pendidikan*, 8(1), 12–23.