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# Gakera Educational Game Media on Nusantara Kingdom Material

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## *Abstrak*

*Guru masih memiliki keterbatasan dalam menyediakan media pembelajaran, terutama media berbasis teknologi. Dampak dari hal ini yaitu rendahnya hasil belajar siswa. Dengan demikian, tujuan dilakukannya penelitian ini yaitu untuk mengembangkan media pembelajaran berbasis teknologi pada muatan pelajaran IPAS kelas IV sekolah dasar pada materi Kerajaan Nusantara agar dapat meningkatkan hasil belajar siswa. Penelitian ini merupakan penelitian dan pengembangan (R&D). Model pengembangan yang digunakan yaitu model pengembangan ADDIE. Metode pengumpulan data yang digunakan yaitu observasi, tes, angket, dan wawancara. Instrumen pengumpulan data berupa lembar kuesioner dan soal tes. Subjek penelitian yaitu ahli media dan ahli materi pembelajaran. Subjek uji coba yaitu pada uji coba skala kecil berjumlah 6 siswa, sedangkan pada skala besar berjumlah 18 siswa. Teknik analisis data menggunakan analisis deskriptif kualitatif, kuantitatif, dan statistik inferensial. Hasil uji kelayakan produk media game edukasi Gakera yang dinilai oleh tim ahli, diperoleh skor rata-rata 90% dari ahli media yang termasuk dalam kategori sangat layak. Selanjutnya, skor kelayakan rata-rata oleh ahli materi didapatkan sebesar 87,5% dengan kriteria sangat layak. Selanjutnya, diperoleh uji-t yaitu terdapat perbedaan hasil belajar siswa sebelum dan setelah menggunakan media permainan edukasi Gakera. Disimpulkan bahwa media permainan edukasi Gakera sangat layak dan efektif untuk diterapkan dalam proses pembelajaran karena mampu meningkatkan motivasi dan hasil belajar siswa.*

***Kata Kunci:*** *Media Pembelajaran, Permainan Edukasi, Gakera*

## Abstract

Teachers still need to work on providing learning media, especially technology-based media. The impact of this is low student learning outcomes. Thus, this research aims to develop technology-based learning media for grade IV elementary school science and science lesson content on Nusantara Kingdom material to improve student learning outcomes. This research is research and development (R&D). The development model used is the ADDIE development model. The data collection methods were observation, tests, questionnaires, and interviews. The data collection instruments are questionnaires and test questions. The research subjects are media experts and learning material experts. The test subjects, namely in the small-scale trial, were 6 students, while on a large scale, there were 18 students. Data analysis techniques use descriptive qualitative, quantitative analysis, and inferential statistics. The results of the feasibility test for Gakera's educational game media products, assessed by a team of experts, obtained an average score of 90% from media experts, which was included in the very feasible category. Furthermore, the average feasibility score by material experts was obtained at 87.5% with very feasible criteria. Next, a t-test was obtained with a Sig value. (2-tailed) of 0.000 on a small scale and a large scale. The Gakera educational game media was feasible and practical to be applied in the learning process because it increased student motivation and learning outcomes.

**Keywords:** Learning Media, Educational Game, Gakera

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## 1. INTRODUCTION

Advances in science and technology in the current era require changes in human life, including in the education system (Salehudin & Asiyani, 2022; Varisa & Fikri, 2022). In this era, technology has developed rapidly, so in the field of education, especially in learning activities, it is hoped that digital technology can be utilized (Fajrie et al., 2021; Jannah & Atmojo, 2022; Latip et al., 2023). Technology integration is critical in education today. This is based on the current curriculum, namely the Independent Curriculum. Teachers must have

good skills in using various types of learning media, especially technology-based media, as required in implementing the current curriculum, namely the Independent Curriculum (Aditama et al., 2022; Isnawan & Sudirman, 2022).

The Merdeka Curriculum is applied at the formal education level, including the elementary school level (Kahfi, 2022; Rahmadayanti & Hartoyo, 2022). The Merdeka Curriculum at the elementary school level is only applied to grades I, II, IV, and V. One of the differences between the Merdeka Curriculum and the 2013 Curriculum is integrating science and social studies content into IPAS. IPAS, or Natural and Social Sciences, studies living things and inanimate objects in the universe and inanimate objects in the universe and their interactions. Apart from that, IPAS also studies humans both as individual creatures and as social creatures (Adnyana & Yudaparmita, 2023; Surya et al., 2023). There are two main elements in science and science learning: standing science and social sciences (science and social) and process skills.

The problem currently occurring is that there are still many students who need help learning. Previous findings also revealed this, which stated that many students still had difficulty learning science and technology (Budiwati et al., 2023; Silvia et al., 2023). Other findings also reveal that students' difficulties in learning result in low science students' learning outcomes (Muhardini et al., 2023; Wanti & Chastanti, 2023). Based on the interviews and observations of teachers and students of class 4 at SD Negeri Simpur 02, Belik District, Pemalang Regency, several problems emerged in learning. One of them is studying science and technology, especially the topic of the Archipelago Kingdom, which shows that student learning outcomes are still relatively low and need to be fully completed. This is reflected in the many students who still need to achieve the minimum passing score. One of the contributing factors is the limited learning media available to teachers in delivering educational material, as well as the repetitive use of media. Apart from that, the use of technology-based learning media is separate from students actively using technology in science and science subjects on Nusantara Kingdom material. The absence of this media causes students to get bored quickly.

Based on these problems, interesting, innovative, and creative learning materials are needed to increase students' learning motivation and encourage active learning participation. If students' interest and motivation to learn increase, student learning outcomes can also increase (Amaliyah & Rahmat, 2021; Faiz et al., 2022). Apart from that, media must also be technology-based. The change in learning media from conventional to technology-based can potentially increase students' knowledge (Eriyanti et al., 2023; Mulyani et al., 2023). Playing technology-based games is a fun activity for some people and students (Fathimah & Ishartiwi, 2018; A. C. Sari et al., 2019). Technology-based games can be developed for learning purposes to make learning activities more enjoyable and increase the user's insight.

Educational games are games created to teach students about a specific topic (Licorish et al., 2018; Widyaa et al., 2022). Incorporating games into learning activities will show that learning can be fun, thus keeping students enthusiastic and preventing students from feeling bored during learning activities (Eriyanti et al., 2023; Mulyani et al., 2023; Wang & Tahir, 2020). Developing technology-based learning materials, especially the Gakera educational game media in science learning for class IV students on the Archipelago Kingdom at SD Negeri Simpur 02, solves this problem. The Gakera educational learning game will contain an attractive display, exciting quizzes, and several level choices. Gakera learning media can be accessed via laptop, computer, or smartphone.

Previous research regarding the development of technology-based educational game media is relevant and supports the research. The final results of research on the application of technology-based media, such as the Kahoot game, show an increase in student grades after using this media (Ortiz-Martínez et al., 2023; Wang & Tahir, 2020). Apart from that, game

media research has proven effective in improving student learning outcomes (Mahesti & Koeswanti, 2021; Zineb et al., 2022). In addition, research that utilizes technology-based media, such as educational game media, shows promising results because it can increase student motivation and learning outcomes (Fitriyana et al., 2020; Nugroho & Ma'arif, 2022). However, there has been no study regarding Gakera Educational Game Media Material from the Archipelago Kingdom. The advantage of the Gakera Educational Game Media is that it makes students more enthusiastic and actively participate in learning. This research aims to develop Gakera products and analyze the effectiveness of the products developed on student learning outcomes. Technology-based learning media such as the Gakera educational game (Nusantara Kingdom Game) is expected to improve student learning outcomes.

## 2. METHODS

This research uses a type of Research and Development or R&D. The location of this research is at Simpur 02 State Elementary School, Pemalang Regency. This research aim to produce technology-based learning media on IPAS learning material of Nusantara Kingdom in grade 4. The learning media product developed is the educational game Gakera (Game Kerajaan Nusantara). In this study, observation, interviews, questionnaires, and data documentation were used as data collection methods. This research used non-test techniques as a data collection technique. The resulting data is sourced from needs analysis and media feasibility analysis. The development model used in this R&D research is the ADDIE model. The ADDIE development model consists of the stages of analysis, design, development, implementation, and evaluation (Putri et al., 2021).

Analysis is the first stage. During the analysis phase, researchers collect the necessary data related to problems in the classroom. The data collection is through classroom observations, interviews with teachers, questionnaires, and documentation of fourth-grade students of Simpur 02 State Elementary School. In addition, data collection on the needs of students and teachers was also carried out through questionnaires. The second stage is the design phase, which starts by creating the design for the Gakera product to be developed. Product development is the third step. Product development is made based on the design that has been planned. Gakera educational game media products are made using Smart Apps Creator 3 (SAC 3) software. After the product has been made and is by the design, the next step is to validate it. Expert validation is carried out by media experts and material experts. Lecturers with expertise in teaching primary school media were considered media specialists in this study. A lecturer with expertise in science learning materials for elementary schools becomes an expert in study materials. Table 1, and Table 2 displays instrument grids for materials experts and media experts.

After an evaluation conducted by material and media experts, then the scores are analyzed to assess the feasibility of the media and the material. The criteria for assessing the feasibility of validation of media experts and material experts are presented in Table 3. Large and small-scale trials of educational media game products are conducted following the validation of media experts and material experts. Students on a small-scale trial amounted to 6 students, while on a large scale amounted to 18 students. Then, after the implementation stage, an evaluation was carried out to measure whether or not the Gakera learning media was good. The techniques used to analyze data are qualitative descriptive analysis and quantitative and inferential statistics. Qualitative descriptive analysis was used to analyze input provided by experts on the Gakera learning media being developed. Quantitative descriptive analysis was used to analyze the scores experts gave to the Gakera learning media being developed. Inferential statistical analysis is used to analyze the effectiveness of the

developed Gakera learning media on student learning outcomes. Students take pre-test and post-test to see the effectiveness of the media that has been developed.

**Table 1**. Media Expert Validation Questionnaire Grid

| Aspect | Question Number |
|---|---|
| Material in the Gakera Game | 1,2,3 |
| Gakera Game View | 4,5,6,7,8,9,10,11,12 |
| Use of Gakera Game | 13.14.15,16,17,18,19,20 |

**Table 2**. Material Expert Validation Questionnaire Grid

| Aspect | Question Number |
|---|---|
| Material Competence in the Gakera Game | 1,2,3,4 |
| Suitability of Gakera Game Material | 5,6,7,8,9 |
| Languages in Gakera Game | 10,11,12 |

**Table 3**. Expert Validation Assessment Criteria

| Percentage | Criteria |
|---|---|
| 81% - 100% | Very Worth it |
| 61% - 81% | Worthy |
| 41% - 61% | Enough |
| 21% - 41% | Not Feasible |
| <21% | Not Worth it |

## 3. RESULTS AND DISCUSSION

### Result

Media development is based on the ADDIE development model. Starting with analyzing the problems that arise in class IV of Simpur 02 State Elementary School. The analysis was conducted through classroom observations, interviews with teacher, and student data documentation. The analysis results indicate that many students' scores in the IPAS subject material on Kingdoms in Indonesia were still below the minimum passing grade. Thus, student learning outcomes are still unsatisfactory because their grades are still low. This is because the use of media is less innovative, and creative, and has not made students actively involved using technology-based media. Limited procurement of learning media results in learning activities not running optimally. Therefore, there is a need for technology-based learning media that can increase enthusiasm, active student participation, and student learning outcomes.

Next is the design step, at this step the content design of the Gakera product is made. The design that will be made includes making the design of the Gakera product, making media design, preparing learning activities, and preparing the contents of the material to be inserted into Gakera media. The material compiled on the Gakera media is the IPAS subject matter of the Kingdom in Indonesia. The learning outcomes used are that students recognize culture and history (both figures and periodization) in the province where they live and connect with the context of current life. Making the background of the Gakera game through Canva is also included in the design stage. The visual design of the product is carefully crafted to align with the survey results regarding student’s need. The design is also adapted to the characteristics of elementary school students.

Furthermore, at the development step, the Gakera game media was made. After making Gakera media through SAC 3 software is complete, then the Gakera game is exported

into the software so that it can be opened on a laptop. Gakera game contains Let's Learn, Let's Play, Let's Think, Info, CP, and Developer Profile. The Let's Learn menu contains material about the Nusantara Kingdom. The Let's Play and Let's Think menus contain questions that must be answered by students but are presented differently. The CP menu contains Learning Outcomes and Learning Objectives. Furthermore, researchers checked the suitability of the Gakera game before conducting a validation test. The content of the developed Gakera product is presented in Figure 1.


**Figure 1.** Gakera Learning Media Development Results

Material and media experts evaluate the validity of products. To ascertain the viability of Gakera educational game media product that will be utilized in student IPAS learning, product validation is conducted. The findings of the media and material specialists' validation of Gakera product showed in Table 4.

**Table 4.** Product Validity Test Results

| No. | Test Subjects | Validity Results | Information |
|---|---|---|---|
| 1 | Media Expert Validation | 90% | Very Worth it |
| 2 | Material Expert Validation | 87,5% | Very Worth it |

Table 4 indicates that the media product falls within the category of being highly suitable for implementation in learning. The next stage after finishing the validation is to carry out small- and large-scale experiments using Simpur 02 State Elementary School fourth grade. For the IPAS subject topic of Nusantara Kingdom. Six students participated in the small-scale exam. Then, eighteen students took the large-scale exam. Both small and large-scale trials conduct pretest and posttest. After obtaining the outcomes of the student's pre-test and post-test, then a normality test was carried out. Then, analyze the t-test to determine the effect of using Gakera. The t-test was conducted based on the pretest and post-test . The normality test results are displayed in Table 5.

**Table 5**. The Result of The Normality Test

| No. | Test Subjects | Sig. |
|---|---|---|
| 1 | Pre-test Small-scale Trials | 0.078 |
| 2 | Post-test Small-scale Trials | 0.900 |
| 3 | Pre-test Large-scale Trials | 0.105 |
| 4 | Post-test Large-scale Trials | 0.091 |

The data points to a normal distribution of the data. Based on the normality test decision-making criteria, which specify that data is normally distributed if the Sig. > 0.050,

this is done. The t-test is used to find out if utilizing Gakera media has a changing effect. Based on the results of the pretest and posttest, a t-test was performed. The results of the T-test showed in Table 6.

**Table** 6. The Result of T-test

| No. | Test Subjects | Average Score of Pre-test | Average Score of Post-test | Sig. (2-tailed) |
|---|---|---|---|---|
| 1 | Small-scale Trials | 18.0 | 75.7 | 0.000 |
| 2 | Large-scale Trials | 29.6 | 78.0 | 0.000 |

Based on the results of the small-scale trial, the average pretest score of 6 students was 18. Then, the average post-test score of students on a small scale was 75.7. In the large-scale trial, the average score of 18 students was 29.6, while the average post-test score of students was 78. After conducting the t-test, the analysis results showed that Sig. (2tailed) data is 0.000 or <0.05 on small-scale and large-scale trials. It is known from the data that the large and small-scale trials had a Sig. (2-tailed) < 0.05 The conclusion from this is that there is a significant effect on the use of Gakera educational game media. This shows that the Gakera educational game learning media is effectively used in learning IPAS grade IV primary school material on the Nusantara Kingdom. In addition to the t-test, an average increase test was also conducted. To find the average increase in pretest and posttest scores, the mean increase test was used. The calculation of the average increase is done through N-Gain analysis. The N-Gain test results are displayed in Table 7.

**Table 7**. The Result of The N-Gain Test

| No. | Test Subjects | N-Gain Score |
|---|---|---|
| 1 | Small-scale Trials | 0.71 |
| 2 | Large-scale Trials | 0.71 |

The N-Gains test outcomes showed that the large-scale trials had an N-Gain score of 0.71 and the small-scale trials had an N-Gain score of 0.71. With a score of g>0.7 the result indicates that both trials fall into the high group according to the N-Gain score sharing category. Thus, there was an increase in the average which was at a high score after students used Gakera educational game learning media in grade IV in elementary school material Nusantara Kingdom.

**Discussions**

The development research produced a digital-based educational game learning media product called the Gakera game (Nusantara Kingdom Game) on the Nusantara Kingdom material science learning content for fourth-grade elementary school students. Based on expert tests and product trials on students, the results showed that the Gakera educational game was feasible and effective in learning activities. The results of data analysis also show that the Gakera educational game media is very suitable and adequate for integration into the learning process due to various factors. First, Gakera learning media suits students' needs. This is based on observations that students rarely use learning media, especially technology-based educational media. Applying Gakera educational game media in learning is the right choice because the media is technology-based. Previous findings state that using technology-based media positively impacts learning (Ahmadi et al., 2017; Dewi et al., 2019; Komalasari & Rahmat, 2019). The application of technology in education is necessary because all aspects of life today involve technology, and the use of technology-based media can make it easier to

achieve student learning goals (Qistina et al., 2019; Sulistianingsih & Mukminan, 2019; Suso et al., 2021).

Second, it increases students' interest in learning, motivation, and activity. Learning motivation is one thing that determines learning because, with high learning motivation, students will be able to learn (Endris & Suhartini, 2022; Fathoni & Surjono, 2022; Shofa & Surjono, 2018). Students feel interested in using Gakera media, which is a technology-based media. This is because students are rarely involved in operationalizing technology-based media. Applying the Gakera game media has an impact on making the learning process atmosphere fun and lively. Implementing game learning activities can reduce students' boredom levels and make the atmosphere more enjoyable and less monotonous (Handayani & Rochmahwati, 2020; Ulhusna et al., 2020; Zulhelmi et al., 2023). The increase in the activity of class IV students at SD Negeri Simpur 02 in the learning process using Gakera media was observed. Fun learning activities are reflected in students' activeness in interacting with fellow students and teachers while using media (Bhaskara et al., 2017; Maathoba & Rijanto, 2022). Quality learning is proven by students' active involvement in learning (Bhaskara et al., 2017; Sabilah et al., 2021).

Third, Gakera educational game media makes learning more accessible for students. The material presented in the Gakera educational game media summarizes the material and is presented differently from student books. Students can actively press the symbols in the Gakera game to read the material. The summary of material presented in Gakera products is clear to students and makes the learning process more manageable. Students enjoy learning because the appearance of the Gakera game attracts attention. Thus, if students like it, students will have no difficulty receiving information (Kurniawan, 2020; Rohmani et al., 2021). Teachers are also more helpful in transferring knowledge when using Gakera educational game media. This aligns with the statement that using educational games as a learning medium has proven effective in transferring knowledge to students (Licorish et al., 2018; Widyaa et al., 2022). Apart from that, having quizzes in the form of games will reduce students' anxiety levels so that students' memory and reasoning will increase (Santoso & Widiyanti, 2022; Sari et al., 2018). Thus, student learning outcomes can also improve.

The conclusions of the research conducted are consistent with previous research. According to previous research, using technology-based game media to improve student learning outcomes is beneficial (Ortiz-Martínez et al., 2023). Apart from that, the use of game media has proven to be effective in improving students' academic achievement and fostering enthusiasm for learning (Ahmadi et al., 2017; Dewi et al., 2019; Komalasari & Rahmat, 2019; Mahesti & Koeswanti, 2021). Other research shows increased student learning achievement after using educational game media (Erwin & Syukur, 2019; Kusumawati, 2022; Widayati et al., 2021). From the research results on using Gakera educational games, it can be concluded that Gakera media is suitable for use in science and science learning for class IV students studying Nusantara Kingdom content. Gakera educational games make learning more accessible for students and teachers to transfer knowledge. The advantages of Gakera educational game media include making it easier for students to understand the material, arousing students' interest in learning, increasing student activity, and creating a pleasant learning atmosphere. This is because the appearance and content of Gakera media are exciting and raise students' enthusiasm. The colors, images, animations, and sounds are chosen according to the student's characteristics.

Based on research, it is known that Gakera educational game media makes it easier to achieve learning goals. The limitation of this research is that the educational game media Gakera, which was developed, is only intended for fifth-grade elementary school students, especially in the Nusantara Kingdom material. This research implies that the developed educational game Gakera is effectively used by students in learning science and technology

in class IV at SD Raya Nusantara Elementary School. The research results show that teachers can use the product to increase student learning motivation, create a pleasant learning atmosphere, and make learning more accessible for students to understand.

## 4. CONCLUSION

Considering the findings of the study using Gakera educational game learning media (Game Kerajaan Nusantara) in fourth-grade IPAS learning of the Nusantara Kingdom material, it was concluded that Gakera media is effectively used as a learning media. This is because Gakera learning media has proven to be very worth it and effective to be used to improve the learning outcomes of IPAS on the material of Nusantara Kingdom in fourth-grade primary school student. The conclusion is based on the results of due diligence analysis and trials.

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