Vol. 7, No. 2 (2023) 207-216 ISSN: 2597-4866
Indonesian Journal of Primary Education

# Development media Ludo Build Flat is problem based to improve critical thinking skills fourth grade Elementary School students

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Submitted/Received 2 October 2023; First Revised 25 October 2023; Accepted 1 December 2023
First Available Online 1 December 2023; Publication Date 1 December 2023

***Abstract***

*The aim of developing problem-based plane figure ludo or LUNTAR media is to further improve critical thinking skills in fourth grade elementary school students. This research uses research and development ( R&D) methods. The model used by researchers is the ADDIE model which consists of 5 steps, namely analysis , design , development , implementation and evaluation . The instruments in this research used observation, interviews, tests and questionnaires. Data collection techniques used include observation, interviews, validation of material experts and media experts as well as tests to improve critical thinking skills. The data analysis technique used is descriptive analysis technique quantitative. The research results in this study can be seen from the average results of media experts for problem-based LUNTAR media getting 3.8 which is declared "feasible" and the material expert assessment gets 4.5 which is declared "very feasible". Based on the effectiveness of the media, teachers' responses received an average of 4.8 which was declared "very effective" while the pre-test and post-test results of class IV students using the N-Gain test received an average of 0.92 in the "high" category. Based on the results of this research, it can be concluded that research and development of problem-based LUNTAR media can improve the critical thinking skills of fourth grade elementary school students.*

***Keywords:*** *Ludo Build Flat, Problem, Critical thinking*

## INTRODUCTION

Education is a very important thing in life in society and in the country. Education creates human resources or what can be called quality students. According to Rahmat & Abdillah (2019) education is a conscious and planned work to provide guidance or assistance in creating physical and spiritual potential given by adults to students to achieve development and achieve goals so that students can carry out their life tasks independently. It is explained that education is an effort to prepare students through teaching activities in the future which will enable students to carry out their lives independently. According to Irfan, Muhiddin, Ristiana (2019) Education is carried out through the process of human (student) thinking about themselves and their environment to gain knowledge through the learning process. Education can be done through guidance, learning and training.

Learning is a process and part of creating successful education. According to Sagala (2010) Learning is a two-way communication process, teaching is carried out by the teacher as an educator, while learning is carried out by the students or pupils. So learning is a learning process carried out by teachers and students to improve abilities and mastery of learning material. The learning process is carried out with strategies, techniques, learning resources and learning media. Apart from that, the curriculum used is also taken into account.

A learning process can be achieved in creating national education goals that require appropriateness of children's development levels, starting from primary, secondary and higher education. This cannot be separated

from the existing curriculum in Indonesia, currently the curriculum implemented in Indonesia is the independent curriculum. Minister of Education and Culture-Research and Technology Regulation Number 56 of 2022 concerning Implementation of Education Plans in the Context of Learning Recovery in relation to the independent curriculum plan in education early childhood , primary teaching, and secondary school . The curriculum used in Indonesia always changes and develops according to the needs of the year.

In its implementation, the independent curriculum has a structure, namely intracurricular learning and a project to strengthen the profile of Pancasila students. Permendikbudristek Number 56 of 2022 concerning Guidelines for Implementing Curriculum in the Context of Learning Recovery Intracurricular learning activities for each subject refers to learning outcomes. The profile of Pancasila students includes faith, devotion to God Almighty, noble character, global diversity, mutual cooperation, independence, critical reasoning, creativity. Strengthening the profile of Pancasila students is included in every subject. Minister of Education and Culture Regulation (2016) One of the subjects in elementary school is mathematics which contains natural numbers and simple fractions, Geometry and simple measurements, simple statistics. The competencies contained are being able to solve problems, be critical, be confident and so on.

Mathematics is a science that studies things in the surrounding environment, such as buying and selling goods, exchange money, measure distance and time, and much more. James (Rahmah 2018) Mathematics is the science of logic, regarding shape, arrangement, quantity, and concepts that are related to one another. So, mathematics is an organized, logical science regarding concepts related to numbers.

Considering that mathematics is a science related to life and a concept, various ways are needed to improve the quality of human resources in dealing with daily life problems and achieving educational goals in this developing era. Varied and interactive learning can be supported by utilizing various learning media This will later produce active students during learning taking place. However, in reality at UPT SDN Srengat 03 Blitar Regency, the learning process has not maximized the media. Media is something that is used to convey learning to students. According to Arsyad (2017) learning media is anything that can be used to convey a message or information in educational and educational experiences so that they can stand out to students and their interest in learning. According to Oktapiani, Sumardi, and Giyartini (2020) Media consists of various kinds and types, it is this diversity that makes media each have their own charm and uniqueness.

Limitations in media use encountered by researchers at UPT SDN Srengat 03 Blitar Regency. Based on the results of research conducted by researchers at UPT SDN Srengat 03 Blitar Regency, on November 12 2022, through observation data and interviews with class IV teacher sources, several problems were obtained. According to Fatih et al. (2023) A learning environment that is conducive, interactive, communicative, really supports students' understanding in learning. The problem found is that learning media is still limited, there has been no development of varied media interactive, time allocation for creating media.

Apart from that, teachers also often create media but have used traditional game-based learning media which is less effective for students. According to Alfi, Fatih, and Islamiyah (2022) Today's teachers must be creative, namely being able to take advantage of these developments by packaging technology and information simultaneously in a learning framework . The cause of the ineffectiveness of this media is the large number of students who are only divided into 2-4 groups and only 1 student in one group can play, this causes the other students to not be active and pay attention. Apart from these problems, every subject currently includes strengthening the profile of Pancasila students, one of which is applying critical

reasoning. Meanwhile, at UPT SDN Srengat 03 Blitar Regency, class IV is lacking in applying critical reasoning skills, especially in mathematics subjects.

The material that the researchers took was flat shapes, including the characteristics of flat shapes, flat shape formulas, and so on. This material will be published in plane figure ludo or LUNTAR media. According to ASIAPAC BOOKS (2012) Ludo is a game packaged in India that has been around since the 6th century. This game is played by 4 players and requires dice to play it. In order to win this match, players must roll the dice to move the piece back to its home. According to Sadiman (2016) By involving games in learning you can attract students' attention so that it can make students become active in it following the learning.

This research developed the learning media plane figure ludo or LUNTAR which was developed and modified with several supporting components and attractive designs so that students can be directly involved in using the media. Furthermore, media use is carried out in groups so that competition occurs. The advantage of the plane figure ludo or LUNTAR media is that it is problem-based and can make students think critically. In this media there are cards with problem-based questions that must be answered by each group.

Problem-based is a learning concept where students are faced with a problem that they must solve. According to Ibrahim and Nur (2010) stated that *Problem Based Learning* (PBL) or problem based is a learning model which involves students trying to solve problems using several method stages. Critical thinking is a student's skill to think in deciding something. Komariyah, Fatmala, and Laili (2018) Critical thinking is thinking with the aim of finding an appropriate decision reasonable person who can decide to do something. Focused critical thinking into the meaning of something that is full of consciousness and leads to a goal. According to Nina, Fatih, and Alfi (2023) Critical thinking will give students the ability to think independently, which means they don't need to rely on other students for everything.

The development of plane figure ludo or LUNTAR media can make students active, think critically and have curiosity because they are directly involved in using the media. According to Fatih and Alfi (2021) Effective learning media in the learning process is needed to achieve learning goals. Students will more easily understand material about flat figures when learning mathematics.

Plane figure ludo or LUNTAR media will provide students with learning and critical thinking experiences which is fun, so it can be used as a solution improve students' critical thinking skills in mathematics subjects about plane figures. According to Fatih (2023), this form of communication can occur either through direct face to face or through media assistance as an intermediary. Results Previous research shows the success of the increase student learning outcomes who use Ludo media or similar board games.

Based on the background of the problem, supported by expert opinion and the results of previous research. Apart from that, based on the results of observations and interviews conducted by researchers. Based on this, the researcher conducted research development with the title "Development of Problem-Based LUNTAR (Ludo Bangun Datar) Media to Improve Critical Thinking Skills for Fourth Grade Elementary School Students".

## RESEARCH METHODS

The research method used in this research is a type of research *and development* (R&D). According to Sugiyono (in Yuntari, 2019) Development research is a research method used to produce products resulting from an analysis of the needs of the subject being studied. Development research It is also used to test the effectiveness of the product so that it can be used by the wider community.

The development model used in this research is ADDIE. This model has 5 stages that must be carried out, namely *analysis* , *design* , *development* , *implementation* , *evaluation* . The following is a picture of the development model flow.

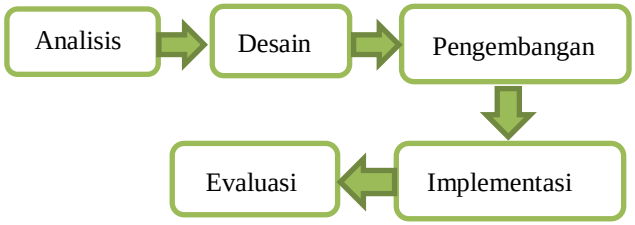



**Figure 1**
**ADDIE Model Flow**

The subjects of this media development were teachers and students of class IV UPT SDN Srengat 03 Blitar Regency, totaling 20 students. According to Fatih *et al.* (2022) Data analysis techniques are carried out quantitatively and qualitatively. Data collection techniques use questionnaires and tests. The questionnaire used to find out was a questionnaire regarding the feasibility of material expert validation, media expert validation, and effectiveness, while the test to determine the improvement of critical thinking skills was carried out by students.

The media suitability assessment is obtained through the assessment of media experts and material experts. Feasibility assessment is carried out using a questionnaire. The results of these calculations are then averaged to determine the suitability of the media. The following is a range of media eligibility categories.

**Table 1**
**Eligibility Criteria**

| Average Score | Category |
|---|---|
| X > 4.2 | Very Worth It |
| 3.4 < X ≤ 4.1 | Good |
| 2.6 < X ≤ 3.3 | Enough |
| 1.8 < X ≤ 2.5 | Not enough |
| ≤ 1.8 | Very Inadequate |

Source: Widoyoko ( in Yuntari, 2019)

The level of media suitability can be calculated after calculating the average score from each validation and trial which is converted into qualitative data in the table above. Based on the feasibility level classification table above, media is said to be feasible if it gets a validation score of at least 3.41 .

Then media effectiveness data was obtained through the results of teacher response questionnaires. The data is then found to be the average. The following is a range of media effectiveness categories.

**Table 2**
**Effectiveness Criteria**

| Average Score | Category |
|---|---|
| X > 4.2 | Very effective |
| 3.4 < X ≤ 4.1 | Good |
| 2.6 < X ≤ 3.3 | Enough |
| 1.8 < X ≤ 2.5 | Not enough |
| ≤ 1.8 | Very Less Effective |

Source: Widoyoko ( in Yuntari, 2019)

The level of media effectiveness can be calculated after calculating the average score from each validation and trial which is converted into qualitative data in the table above. Based on the effectiveness level classification table above, media is said to be effective if it gets a validation score of at least 3.41 .

Furthermore, to calculate the increase in critical thinking skills, it is given in the form of a test containing indicators that students must achieve. The indicators that must be achieved are indicators of critical thinking skills. The percentage of critical thinking skills is obtained by analyzing the following formula.

**Table 3**
**Critical Thinking Skills Category**

| Mark | Information |
|---|---|
| X > 0.70 | Tall |
| 0.30 < X ≤ 0.70 | Currently |
| X < 0.30 | Low |

(Source: Melzer in Syahfitri, 2008)

**Thinking skills**

**student critical** = $\frac{Spost}{Spre}$x 100%

**Description:**

Spost = Post test score

Spre = Pre test score

The percentage of critical thinking skills is calculated using the following formula.

**Students' critical thinking skills** = $\frac{Skor\ yang\ diperoleh}{Skor\ maksimum}$ x 100%

To find out how much improvement in students' critical thinking skills is used g-factor or n-gain. Gains are obtained after students take part in learning using problem-based LUNTAR media.

**N - gain** $= \frac{Spos - Spre}{Smaks - Spre}$

**Description:**

Spost = Post test score
Spre = Pre test score
Smax = Maximum Score

## RESULTS AND DISCUSSION

This research produces learning media in the form of LUNTAR media based on problems for class IV students. Problem-based LUNTAR media was developed using the ADDIE Cennamo et al model ( in Rayanto & Sugianti, 2020). The initial stage is the analysis stage, in this research obtained from the results of observations and interviews with students and teachers at UPT SDN Srengat 03 Blitar Regency. Observations on students and interviews with teachers will be carried out in November 2022.

Observation activities were carried out to determine mathematics learning activities , as well as observe the characteristics of the students in that class. According to Widyoko (in Yuntari, 2019) observation is systematic observation and recording of elements that appear in a symptom on the research object. Based on the results of the initial data collection, it can be concluded that several problems are faced, namely that learning media is still limited, there has been no development of varied media and interactive, time allocation for creating media. Apart from that, teachers also often create media but have used traditional game-based learning media which is less effective for students.

The next stage is the design stage. The design stage is carried out by adapting to what is being researched. According to Fatih (2020), this development stage is a follow-up stage. The media design stage that will be created is real, problem-based media using Ludo. The media is designed to contain images of 8 types of shapes, number cards, pawns and dice. Media development at the design stage is seen in terms of design, material, language. After the design stage, the next stage is the problem-based LUNTAR media development stage.


**Figure 2**
**Media Cover**

The media is equipped with a box containing the media and its components. The front cover has the logo of UNU and the education department as well as pictures of types of flat shapes.

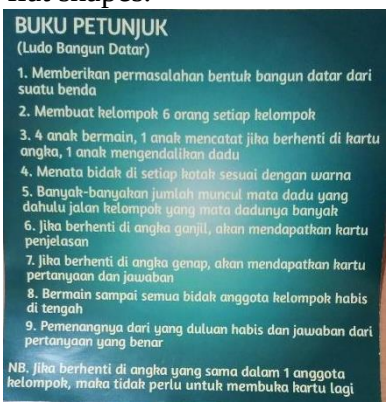



**Figure 3**
**Guidebook**

The inside of the box has instructions attached to the back of the cover. This manual contains the chapters discussed, learning objectives, and LUNTAR steps.

**Figure 4**
**LUNTAR Media Board**

This part of the LUNTAR media board contains images of types of flat shapes, and is colored green, red, yellow, and blue. Apart from that, there are numbers in each box, odd and even numbers.


**Figure 5**
**Number Cards**

This number card section is divided into 3, namely green, red and blue. Blue is an odd number card which contains an explanation of the flat shape material. Red number cards are even number cards that contain questions from flat material, while green number cards are answer cards to question cards.

**Figure 6**
**Pawn**

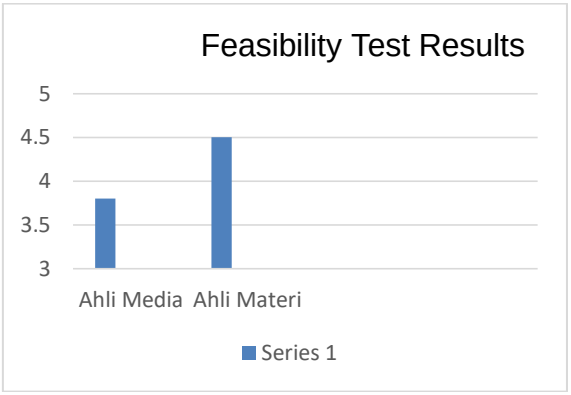
There are 4 different shapes in LUNTAR, namely square, rectangle, triangle and pentagon . Each has its own color, namely red, yellow, green, blue.

After completion of development, media feasibility testing continues with experts. The results of the media feasibility test are shown in table 4.

**Table 4**
**Feasibility Test Results**

| Validation Test | Mark | Category |
|---|---|---|
| Media Expert | 3.8 | Worthy |
| Materials Expert | 4.5 | Very Worth It |

The following are the graphic results of the feasibility test




The feasibility of this problem-based LUNTAR media was obtained from the validation of media experts and material experts. The results of media validation by media experts were an overall average of 3.8 in the **"decent"** category . Even though it is in the "decent" category, in terms of the visual attractiveness of the media, it still requires several improvements, namely the accuracy of the media components. Apart from media experts, media validation is carried out by material experts. The result of media validation by material experts was to get the "Very Appropriate" category with an average of 4.5 . This is in line with research conducted by Aprilia, Fine, and Prasena (2019) stating that the Giant Ludo media is valid and practical to use in learning.

After the product is declared feasible, the next stage is the implementation stage which is carried out with class teachers and class IV students. This implementation stage is used to obtain data regarding the effectiveness of the media and the level of students' critical thinking skills before and after learning using the developed media. The product trial was carried out involving 20 grade IV students at SDN Srengat 03 Blitar Regency. Implementation will take place in October 2023.

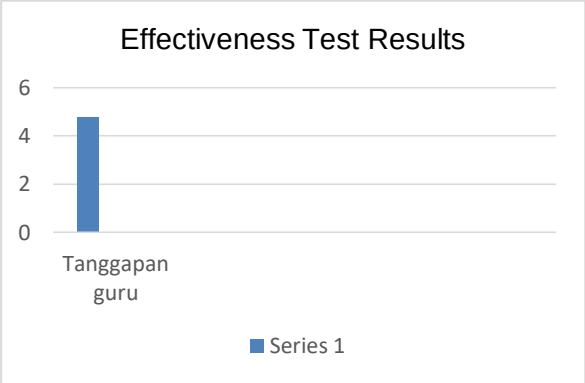
During the process of implementing this product, researchers implemented learning steps in accordance with the Teaching Module that had been prepared. Researchers carried out 2 examples to find out the comparison of levels of critical thinking skills. After each example, students complete a question sheet containing material, namely flat shapes. Meanwhile, the class teacher fills out a media effectiveness questionnaire. The

following is a table of media effectiveness results from teacher responses.

**Table 5**
**Effectiveness Test Results**

| Score obtained | Average | Category |
|---|---|---|
| Teacher Response | 4.8 | Very effective |

The following is a graph of the results of the media effectiveness test.



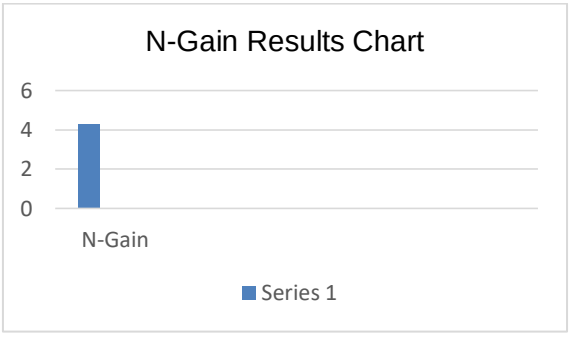

Based on the results of the media effectiveness questionnaire scores obtained from teacher responses in problem-based LUNTAR media to improve the critical thinking skills of class IV students in Blitar district, it was declared **"very effective".** The teacher's suggestions are on the creative aspect of media development.

Furthermore, the effectiveness of problem-based LUNTAR media is obtained from the results of students' critical thinking skills which are assessed using *pre-tests* and *post-tests. The pre-test* and *post-test* contain 10 description questions. The following are the results of *the pre-test* and *post-test* .

**Table 6**
**N-Gain Results Improved Critical Thinking**

| Resp. | Pre-test | Post-test | N-Gain | Category |
|---|---|---|---|---|
| Average | 55.75 | 96.25 | 0.92 | Tall |

The following are the results of N-Gain Improving Critical Thinking Skills.




Based on the results of *the pre-test* and *post-test*, class IV students with the N-Gain test got an average of 0.92 in the "high" category. This high category means that problem-based LUNTAR media can improve students' critical thinking skills.

According to Pamungkas, Mawardi, Astuti (2019) critical thinking is a very important ability to support the success of students' understanding, so that it will have an impact on student learning outcomes. So, the importance of critical thinking for students can support student learning success.

The final stage is the evaluation stage. In this evaluation stage, the researcher made slight revisions to the LUNTAR media based on problems related to media material that was not strong enough and material that was not coherent enough. Researchers also observed the learning process without using media or using media. After receiving advice and validation from media and material experts, the researcher corrected these errors.

**Problem-Based Plane Figure Ludo or LUNTAR Media Development Process to Improve Critical Thinking Skills for Fourth Grade Elementary School Students**

This research resulted in the problem-based LUNTAR media product being developed. Problem-based LUNTAR media was developed according to the procedures and steps for developing the ADDIE model. In the opinion of Cennamo et al ( in Rayanto & Sugianti, 2020) the steps for developing ADDIE start from the analysis, design, development, implementation and evaluation stages.

**Feasibility of Problem-Based Plane Figure Ludo or LUNTAR Media to Improve Critical Thinking Skills of Fourth Grade Elementary School Students**

The feasibility of this problem-based LUNTAR media was obtained from the validation of media experts and material experts. The result of media validation by media experts is to get an overall average in the **"good" category** . Meanwhile, the result of media validation by material experts was to get the "Very Eligible" category. This is in line with research conducted by Aprilia, Fine, and Prasena (2019) stating that the Giant Ludo media is valid and practical to use in learning. Based on the results of validation scores obtained by media experts and problem-based LUNTAR media material experts to improve the critical thinking skills of class IV students in Blitar district, it was declared **"feasible"** to be tested with revisions according to suggestions.

**The Effectiveness of Problem-Based Plane Figure Ludo or LUNTAR Media to Improve Critical Thinking Skills of Fourth Grade Elementary School Students**

The effectiveness of the problem-based LUNTAR media was obtained from the responses of class IV teachers at UPT SDN Srengat 03 Blitar Regency who used a questionnaire by Arganis Ratna Furi. Based on the results of the media effectiveness questionnaire scores obtained from teacher responses in problem-based LUNTAR media to improve critical thinking skills for class IV students in Blitar district, it was declared **"very feasible"** to be tested with revisions according to suggestions. In the opinion of Andita (2019), Ludo Pintar Indonesia's learning media is used effectively in learning. Based on the results of the questionnaire from teacher responses and researchers' opinions, it can be concluded that the effectiveness of the problem-based LUNTAR media is effective for use in mathematics learning about flat shapes. According to Asih, Hawanti, and Wijayanti (2020), teachers can use learning media as a tool to convey information. Based on the research results and according to experts, it can be concluded that media as a tool can be used by teachers.

**Improving Critical Thinking Skills in Problem-Based Plane Figure Ludo or LUNTAR Media to Improve Critical Thinking Skills for Fourth Grade Elementary School Students**

Improving critical thinking skills in problem-based LUNTAR media was obtained from the *pre-test* and *post-test results* of class IV UPT SDN Srengat 03 Blitar Regency students. According to Dewi Pamungkas, Mawardi, Suhandi Astuti (2019) critical thinking is a very important ability to support the success of students' understanding, so that it will have an impact on student learning outcomes. According to Rizky, Cindya, and Fatih (2023) Critical thinking ability is a basic ability that must be mastered by all students. So, the importance of critical thinking for students can support student learning success. Based on this, it can be said that the problem-based LUNTAR (Ludo Bangun Datar) media to improve the critical thinking skills of class IV students at UPT SDN Srengat 03 Blitar Regency is capable of improving them.

## CONCLUSION

This research uses the type of *Research* and *Development with* the ADDIE development model, which consists of *Analysis* , *Design* , *Development* , *Implementation* (Implementation) and *Evaluation* (Evaluation). The feasibility of this problem-based LUNTAR media was obtained from media experts and material experts. The media expert's assessment got an average of 3.8 . Then to validate the material, we got an average of 4.5 . From the results of these two validations, it can be concluded that the media is suitable for use.

The effectiveness of problem-based LUNTAR media was obtained from the results of teacher response questionnaires. The results of the teacher response questionnaire obtained an average of 4.8 which was categorized as "very effective". Based on the results of research on problem-based LUNTAR media development, it can be concluded that it can improve students' critical thinking skills, as evidenced by the N-Gain results, namely with an average of 0.92 in the high category.

Based on the research and development of this problem-based LUNTAR media, the product developed can be used as a medium for class IV teachers regarding flat shapes. This product can also be used for other material media, but more research is needed. Apart from that, this research and development can be used as a reference for teachers.

## BIBLIOGRAPHY

Abdillah, & Rahmat Hidayat. (2019). Ilmu pendidikan konsep, teori, dan aplikasinya. Medan: Lembaga Peduli Pengembangan Pendidikan Indonesia (LPPPI).

Alfi, Cindya, Mohamad Fatih, and Khilyatul Izah Islamiyah. 2022. "pengembangan media power point interaktif berbasis animasi pada pembelajaran IPA." Jurnal Pendidikan : Riset Dan Konseptual 6 (2): 351. https://journal.unublitar.ac.id/pendidikan/index.php/Riset_Konseptual/article/view/487.

Arsyad, Azhar. (2017). Media pembelajaran. Jakarta: PT. RAJAGRAFINDO PERSADA.

Asiapac Editorial. (2012). Gateway to Asian Games. Singapore: ASIAPAC BOOKS.

Asih, Pratiti Kusumaning, Hawanti, Shanty, dan Wijayanti, Okto. "Pengembangan media pembelajaran scrapbook untuk ketrampilan membaca". Indonesian Journal of Primary Education 4 (1) 87-100.file:///C:/Users/LENOVO/Downloads/25404-54929-3-PB.pdf

Fatih, Mohamad. (2020). "Pengembangan bahan ajar puzzle pada matematika berbasis realistik materi KPK dan FPB (Studi Pada Kelas 5 SDN Bendogerit 1 Kota Blitar)." Briliant: Jurnal Riset Dan Konseptual 5 (2): 348. https://doi.org/10.28926/briliant.v5i2.348

Fatih, Mohamad. (2023). "Pengembangan komik narasi untuk meningkatkan ketrampilan menulis dan membaca siswa kelas V SDN Sananwetan 3 Kota Blitar." Briliant: Jurnal Riset Dan Konseptual 8 (3): 551. https://doi.org/10.28926/briliant.v8i3.1232.

Fatih, Mohamad, and Cindya Alfi. (2021). "Pengembangan monopoli karakter berbasis permainan simulasi sebagai upaya peningkatan kecerdasan sosioemosi siswa Sekolah Dasar Di Kota Blitar." Jurnal Pendidikan : Riset Dan Konseptual 5 (1): 51. http://journal.unublitar.ac.id/pendidikan/index.php/Riset_Konseptual/article/view/315.

Fatih, Mohamad, Cindya Alfi, Ekbal Santoso, and Rizki Dwi Novianti. (2022). "Pengembangan ensiklopedi pembelajaran pkn siswa kelas 5 SDN Bendogerit 1 Kota Blitar." Jurnal Pendidikan : Riset Dan Konseptual 6 (1): 112. https://doi.org/10.28926/riset_konseptual.v6i1.467.

Fatih, Mohamad, Ala Khomaria, Lana Diyani Aswitama, Nurlaila Al Latif, and Melati Maulida Hidayat. (2023). "Flip book digital berbasis aughmented reality materi balok dan kubus siswa kelas V SDN Sumberjo 01 Kabupaten Blitar." Jurnal Pendidikan : Riset Dan Konseptual 7 (3): 524. https://doi.org/10.28926/riset_konseptual.v7i3.770.

Ibrahim, M. dan Nur, M. (2010). Pembelajaran berdasarkan masalah. Surabaya: UNESA University Perss.

Irfan, Muhiddin, Ristiana, Evi. (2019). "Pengembangan media pembelajaran IPA Berbasis Powerpoint di Sekolah Dasar". Indonesian Journal of Primary Education 3 (2) 16-27.

file:///C:/Users/LENOVO/Downloads/21765-46995-2-PB.pdf

Jihan, Aprilia Nur Fajar., Reffiane, Fine., dan Arisyanto, Prasena. (2019). Pengembangan Media Ludo Raksasa Pada Tema Selalu Berhemat Energi Untuk Meningkatkan Motivasi Belajar Siswa Kelas IV Sekolah Dasar. Mimbar PGSD Undiksha, 7(2).

Kemendikbud. (2016). Permendikbud Nomor 21 Tahun 2016 Tentang Standar Isi Pendidikan Dasar Dan Menengah. Jakarta: Kemendikbud

Keputusan Menteri Pendidikan, Kebudayaan, Riset dan Teknologi Nomor 56/M/2022 Tentang Pedoman Penerapan Kurikulum Dalam Rangka Pemulihan Pembelajaran.

Komariyah, Siti, Ahdinia Fatmala, and Nur Laili. (2018). "Pengaruh Kemampuan Berpikir Kritis Terhadap Hasil Belajar Matematika." Jurnal Penelitian Pendidikan Dan Pengajaran Matematika 4 (2): 55–60.

Nina, Qurota A'yun, Mohammad Fatih, and Cindya Alfi. (2023). "Pengembangan Media Flashcard Berbasis Augmented Reality Materi Gaya Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Kelas IV." JIIP - Jurnal Ilmiah Ilmu Pendidikan 6 (11): 8558–64. https://doi.org/10.54371/jiip.v6i11.2597.

Nuraini, Rizky Yulia, Alfi, Cindya, dan Mohamad Fatih. (2023). "Pengembangan LKPD Berbasis PJBL Untuk Meningkatkan Critical Thinking Materi Sistem Pernapasan Pada Manusia Kelas V SD." Pendas: Jurnal Ilmiah Pendidikan Dasar 8 (1): 4558-4568.

Oktapiani, Ade Ineu Raina, Sumardi, Giyartini, Rosariana. (2020). "Pengembangan media ular tangga tentang lahirnya pancasila untuk IPS Kelas V SD". Indonesian Journal of Primary Education 4 (1) 56-68. file:///C:/Users/LENOVO/Downloads/24185-54918-3-PB.pdf

Pamungkas, Dewi, Mawardi Mawardi, and Suhandi Astuti. (2019). "Peningkatan keterampilan berpikir kritis dan hasil belajar matematika pada siswa kelas 4 melalui penerapan model problem based learning." Jurnal Ilmiah Sekolah Dasar 3(2):212. doi: 10.23887/jisd.v3i2.17774.

Rahmah, Nur. (2018). "Hakikat pendidikan matematika." Al-Khwarizmi: Jurnal Pendidikan Matematika Dan Ilmu Pengetahuan Alam 1 (2): 1–10. https://doi.org/10.24256/jpmipa.v1i2.88

Rayanto, Y., & Sugianti. (2020). Penelitian pengembangan model ADDIE dan R2D2: Teori & Praktek. Pasuruan: Lembaga Academic & Research Institute.

Sadiman, Arief, dkk. (2016). Media pendidikan pengertian, pengembangan dan pemanfaatan. Jakarta: PT Rajagrafindo Persada.

Sagala, Syaiful. (2010). Konsep dan makna pembelajaran. Bandung: Alfabeta.

Yuntari, Wening Niki. (2019). "Pengembangan media pembelajaran ludo aksara jawa untuk siswa kelas iv di sd Negeri Berbah 2." Basic Education 8 (23): 2-198-2.207. https://journal.student.uny.ac.id/index.php/pgsd/article/view/15647.