Analysis of The Needs of Mathematics Learning Media Material Number of Thousands of Grade III Elementary School

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Abstract
The implementation of learning media is one of the strategies that can be applied and developed by teachers to optimize the learning process. This study aims to examine the needs of mathematics learning media on the material of whole numbers in the thousands. This type of research includes qualitative descriptive research. The results of the analysis of the needs of mathematics learning media in class III SD Muhammadiyah 8 Malang City, it can be concluded that teachers and students really the presence of interactive learning media to visualize the concept of whole numbers in the thousand so that it can improve understanding and increase students' interest in learning. This can see from an average percentage of 71%, which indicated that majority of students need the presence of mathematics learning media. It can be concluded that teacher and students need visualization of abstract mathematical concept in the form of interactive and digital-based learning media to maximize mastery of the concept of whole numbers in the thousands of III grade numerals.

4. Introduction

Today's education strategy needs to adapt to the impact of globalization. The era of industrial transformation 4.0 and technological transformation in the 5.0 audience requires the world of education to adopt cutting-edge technology. As well as overhauling learning methods to better suit the needs of students and teachers (Prijanto & de Kock, 2021).

Technology is rapidly developing and has a positive impact on the learning process, one way that can be done to support the optimization of mathematics learning is through digital content. Supported by the findings of Nuraini et al. (2025), that digital content has become an educational innovation that motivates students. Based on this, learning media that utilizes technology can encourage students' positive attitudes towards the material and learning process (Mulyadi et al., 2019).

Mathematics is one of the essential subjects in the world of education. However, not all individuals realize how important the role of mathematics is in life (Sari & Sulisworo, 2023). Meanwhile, understanding mathematics is very necessary, although not a few students face difficulties in understanding it (Aini et al., 2023).

One of the mathematics subject matters is the number of thousands. However, there are still students who experience obstacles in understanding the material on numbers in the thousands (Manekatami & Mariah, 2023). This is due to the difficulty of students in visualizing the concept of multi-digit numbers with a large number and value of numbers.

Although various methods and strategies have been applied by teachers in the learning process, there are often major challenges related to the low involvement and interest of students in learning (Habibi et al., 2023). One of the main causes found is the use of traditional learning methods that rely on oral delivery of material without media support or tools to strengthen students' understanding (Fawwaz et al., 2022). This shows that the use of learning media has not been fully implemented in the learning process.

In line with the findings of Murni (2023), it is known that most teachers have not been optimal in utilizing media as a tool that supports efficient learning. In fact, the use of learning media is very

important because it can simplify the learning process and increase student involvement in understanding the material (Risky, 2019).

In line with the findings of Puspitasari (2022), learning that is designed in an interesting, creative, innovative, and active way can make mathematics a subject that students are interested in. The presence of interactive learning media is needed to support the learning development of students. To create a fun mathematics learning experience (Akmaliah & Rayungsari, 2024).

5. Method

This research adopts qualitative descriptive approach, which is a type of research that aims to interpret human behavior based on their way of thinking and actions. A qualitative approach is needed to explore and understand new concepts or phenomena. The main goal is to gain a deep understanding of the phenomena being studied, such as behavior, motivation, activities, and observations, through verbal and linguistic descriptions (Sahid et al., 2024).

This research focuses on teachers and students of class III B SD Muhammadiyah 8 Malang City which totals 28 students as the subjects. Information from this study was obtained through teacher interviews and questionnaires used to identify the needs of students. Interviews with teachers as well as the distribution of questionnaires to grade III students were carried out at the beginning of the research. Before being disseminated, the questionnaire instruments and interview questions have passed the validation stage by media experts and material experts. So that both instruments are suitable to be used to obtain data in the field.

Data collection on teachers was carried out through interviews consisting of 13 questions. Guidelines for teacher interviews are shown in Table 1.

Table 1. List of Teacher Interview Questions

Interview Questions
The condition of grade III when the mathematics learning process takes place
Learning strategies that are often applied to mathematics learning
Mathematics material being studied in grade III
Mathematics material that is difficult for students to understand
Obstacles for students related to the material
Solutions provided to overcome these obstacles
How important is the role of media in the learning process.
Media that is often used in mathematics learning.
Students' responses to the teaching materials or learning media used.
Obstacles when implementing teaching materials or media other than books facilitated by the government.
Whether or not the use of digital-based media in the mathematics learning process has been done.
What software/websites are used in creating digital-based learning media.
Availability of internet networks in schools.

Source: Maharani (2021) modified

The above interview guidelines will then be used to prepare an interview instrument for teachers consisting of 13 questions with the same indicators, in order to find out the progress of the mathematics learning process and the needs of the learning media. Meanwhile, for grade III students, needs analysis is explored through questionnaires or questionnaires.

The student needs questionnaire consists of 10 statements that race on the *Guttman* scale. With two answers to the question, "Yes" or "No". The following questionnaire was distributed directly to students to collect data related to their opinions on mathematics learning. By utilizing *the Guttman* scale, this questionnaire can measure the extent to which students agree or disapprove of the statements given (Akmaliah & Rayungsari, 2024). Thus, it allows for a clearer and measurable picture of their responses. Table 2 presents a list of questionnaire questions for students' needs.

Table 2. List of Student Needs Questionnaire Statements

Questionnaire Statement
Is learning mathematics easy for you to understand?
Do you find it difficult to work on the material of the value of the place of the number of thousands?
Do you need media to be able to understand the material of thousands?
Has learning math bored you all this time?
Do you think it is important to learn mathematics using media so that it is easier to understand the material?
Have teachers ever used mathematical media such as original media or digital media that are shown on LCD?
Have you ever learned to use a computer/laptop?
Are you interested in learning the value material where numbers are numbered in thousands using digital media?
Has the math learning delivered by the teacher made you enthusiastic so that you understand the material?
Does learning while playing make it easier for you to understand math material?

Source: Maharani (2021) modified

The student needs questionnaire was measured based on the Guttman scale with a choice of "Yes" or "No" answers. Then, the results of the questionnaire were processed using the calculation formula of Riduwan (2018) in the form of the result of dividing the number of scores obtained by dividing the total score and multiplied by 100%. Furthermore, the results of the analysis are interpreted in the form of percentages and classified according to the level of analysis needs, presented in Table 3.

Table 3. Needs Analysis by Percentage Category

Percentage (%)	Information
1-20	Not needed
21-40	Less need
41-60	Half Need
61-80	Most require
81-100	Much needed

Source: Nisa et al. (2024)

6. Results and Discussion

Based on information obtained through interviews with homeroom teachers of grade III B of SD Muhammadiyah 8 Malang City, the number of students in class III B amounted to 28 students. The teacher stated that regarding the situation in the classroom when learning was taking place, students often followed the learning well. However, occasionally it is inseparable from some children who still often lack focus on following lessons. According to Hidayati et al. (2022), this condition is caused because learning activities in the classroom are not optimal in inviting students to actively participate, thus affecting the quality of learning. Meanwhile, one way that can be applied to encourage active involvement of students in learning activities is with learning media.

The teacher said that the mathematics material that experienced the problem was the concept of thousands. Students are often confused when learning the concept of the value of the place of numbers in thousands. According to Matitaputty (2018), the obstacles that students often experience occur when they misunderstand the value of numbers based on their position or place in a number, so that they have difficulty when following the procedure to determine the value of numbers according to their position, such as units, tens, hundreds, or thousands. Meanwhile, the basic concept of place value is a basic concept that must be mastered because it will affect more complex number concepts (Malihah & Yuhana, 2024).

Teachers have presented concrete media called number bags in teaching place value material. However, the findings of Islamiyah & Qodariah (2022) state that the number pocket media is effectively used in place value material limited to tens and hundreds. According to the teacher's statement, the media is not effective if used to teach the concept of the value of the number of

thousands because it is not optimal in visualizing the concept of the number of numbers in more detail.

The teacher added that the role of learning media greatly determines the optimization of students to understand the material more deeply. Teachers expect each material to have its own media so that the delivery of material can be received optimally by students. However, teachers experience obstacles in the use of learning media, so not all materials are taught with the help of relevant teaching media.

In addition, the teaching materials used in grade III are teacher and student package books. According to the teacher, the students' response to the teaching materials used is that children can follow the material delivered by the teacher. However, teachers feel that it is still not effective to facilitate the full understanding of material concepts. In addition to printed teaching materials, teachers have presented digital-based teaching media, such as viewing learning videos and viewing materials through *PowerPoint* through LCD screens in front of the classroom. Through the application of digital learning media, teaching materials can be visualized in a more dynamic and interactive format so that students will contribute more deeply to the learning process (Nursyam, 2019).

Teachers have never used a variety of *E-Learning* programs to create more varied teaching media. Regarding the internet network available in schools, the teacher stated that every classroom is connected to *WiFi* with smooth internet network quality. In addition to the data and information obtained through teacher interviews, student information data related to mathematics learning and the needs of mathematics interactive media are also needed.

Futhermore, data on the need for mathematics learning media was supported by students through a questionnaire, with the results presented in Table 4.

Table 4. Result of the Students Needs Analysis Questionnaire

Statement	Answer Percentage	Average Percentage	Needs Analysis Results
Is learning mathematics easy for you to understand?	57.14% Answer "No"	71%	Most require
Do you find it difficult to work on the material of the value of the place of the number of thousands?	53.5% Answer "Yes"		
Do you need media to be able to understand the material of thousands?	71.42% Answer "Yes"		
Has learning math bored you all this time?	67.85% Answer "Yes"		
Do you think it is important to learn mathematics using media so that it is easier to understand the material?	64.28% Answer "Yes"		
Have teachers ever used mathematical media such as original media or digital media that are shown on LCD?	100% Answer "Yes"		
Have you ever learned to use a computer/laptop?	71.42% Answer "Yes"		
Are you interested in learning the value material where numbers are numbered in thousands using digital media?	92.85% Answer "Yes"		
Has the math learning delivered by the teacher made you enthusiastic so that you understand the material?	46.42% Answer "No"		
Does learning while playing make it easier for you to understand math material?	85.71 Answer "Yes"		

Based on table 4, it indicates that the results of the analysis of students' needs get an average *percentage* of 71%. This shows that most students need the presence of interactive learning media for mathematics lessons in grade III.

In the first point, it shows that as many as 57.14% of students do not consider that mathematics lessons are easy to understand. In line with the results of interviews with grade III B teachers of SD Muhammadiyah 8 Malang City, students experienced obstacles in mathematics

lessons. This is supported by the findings of Nurhayati et al. (2021), that mathematics can be defined as a science that involves logic, theory, hypothesis, and learning about abstract concepts. This proves that the implementation of mathematics lessons requires the right learning methods and strategies.

In the second point, as many as 53.5% of students found it difficult to have problems related to the place value of thousands. It shows that learners find this material abstract and difficult to understand because it involves many numbers or multi-digits. This fact supports the teacher's statement that students' obstacles in mathematics are related to the concept of value where numbers are counted in thousands.

In the third point, as many as 71.42% of students need the use of interactive learning media in mathematics lessons to understand the value material where the number of thousands is considered abstract. This is in line with the teacher's statement that teaching media that is relevant to the material is needed to teach mathematics concepts so that students get a deep understanding. Supported by the findings of Naja & Aulia (2023), the presence of learning media plays an important role in the learning process as a means of connecting students to understand the material.

In the fourth point, 67.85% felt that mathematics was a boring subject. In line with the teacher's statement that during the mathematics learning situation, students often seem to lack focus. According to Habibi et al. (2023), low student motivation to learn is often a big challenge that is often encountered in the world of education. One of the main factors causing this is the dominance of conventional learning methods that only rely on verbal explanations, without the help of media or teaching aids to support understanding and increase students' interest in learning (Fawwaz et al., 2022).

In the fifth point, 64.28% of students need the presence of media that can facilitate their understanding of the concept of numbers of thousands with simple visualization. This is in line with the teacher's statement that learning media plays a very crucial role in supporting learning so that it is able to optimize material understanding.

In the sixth point, it is known that 100% of students stated that the use of mathematical media such as concrete media or digital media that is shown on LCD has been done. This is in line with the teacher's statement that in mathematics lessons concrete media that has been presented in learning. In addition, teachers have also presented digital learning media, such as viewing learning videos and presenting materials through *PowerPoint slides.* However, the method is only done in lessons outside of mathematics. Meanwhile, students also need to learn media in mathematics lessons.

In the seventh point, as many as 71.42% of students admitted that they were used to learning using digital devices including computers and laptops. This shows that digitalization skills have a positive impact, one of which can be used to support the learning process (Amalia et al., 2025). In addition, by familiarizing students with using computer devices or laptops, it can facilitate the process of implementing digital interactive media, which of course is involved with digital devices.

It is corroborated by the results of the needs analysis in the eighth point, that 92.85% of students are interested in learning thousands of numbers material using digital media. In the ninth point, 46.42% of students felt that the mathematics learning delivered by the teacher did not make them enthusiastic so that they did not get the maximum understanding of the material. This is relevant to the need for the presence of interactive learning media to support students' learning development, in order to create a pleasant mathematics learning experience (Akmaliah & Rayungsari, 2024).

In the last point, 85.71% of students stated that learning while playing can help them to understand mathematics material. In line with the opinion of Setiawan & Yandari (2020), at the elementary school age stage, children tend to enjoy playing, so teacher innovation is needed in optimizing fun learning media. Students also stated that learning while playing has the potential

to increase their motivation and understanding of the concepts of the material being studied.

Based on the presentation of the results of interviews with grade III teachers and supported by the results of the questionnaire on students' needs for mathematics learning experiences and mathematics interactive learning media, it indicates that teachers and students really need visualization of abstract concepts of thousands. Following up on this, the solution that teachers can apply is by presenting several relevant learning resources and media so that students get a varied learning experience, especially with technology integration.

Some technology-based teaching media that can be presented in the learning process to deliver material include e-modules, e-LKPD, and digital interactive media (Safitri, 2022). Teaching materials that are possible are used as a medium for delivering material and are able to visualize abstract mathematical concepts, one of which is through digital interactive media. Supported by the statement of Nurhidayah et al. (2025), digital learning media not only acts as a bridge between abstract concepts and more real visualizations, but is also able to increase student participation in learning

One of the applications that can create an interactive media for learning mathematics of thousands of numbers is Articulate Storyline 3. Articulate Storyline 3 is one of the *e-learning software* that allows its users to design interactive learning content (Saski & Sudarwanto, 2021). This interactive media based on Articulate Storyline 3 is in the form of a game, which contains a combination of audiovisual content such as materials, learning videos, various interactive quizzes drag *and drop*, *select one*, *entry text*, *matching one*, and evaluation quizzes in the form of *multiple choices*. The existence of quizzes that highlight students' attention can develop an interest in finding out, increase the spirit of learning, and of course present students' interest in using interactive learning media (Astuti et al., 2021).

In line with the research of Yati (2023), who developed Articulate Storyline 3-based mathematics learning media for elementary school levels, the research findings indicate that the developed media can increase students' interest in learning and is effective in supporting teachers during learning activities. Related to the findings of Adhiana (2022), which revealed that Articulate Storyline is a learning medium that can improve the quality of learning in schools. In addition, the findings of Fransisca et al. (2022) indicate that interactive learning media based on Articulate Storyline 3 can encourage improved student learning outcomes. It can be concluded that the presence of digital interactive media based on Articulate Storyline is needed as a mathematics learning medium for elementary grade III numeracy material.

6.1. Conclusion

The results of the analysis of the need for interactive media in grade III of SD Muhammadiyah 8 Malang City, indicate that teachers and students really need the presence of interactive learning media to visualize the abstract concept of thousands of numbers so that they can increase understanding and increase students' interest in learning the material of thousands of numbers. It can be seen from the average *percentage* of 71%, which shows that most students need mathematics learning media. It can be concluded that teachers and students need visualization of abstract mathematical concepts in the form of interactive and digital-based learning media to maximize the mastery of the concept of thousands of numbers in grade III elementary school.

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References

Adhiana, V. I., Yuniawatika, Y., Ahdhianto, E., & Wantoro, J. (2022). I*nteractive media development using articulate storyline-based instructional games for teaching fractions*. Basic Education Profession, 9(1), 15-27. https://doi.org/10.23917/ppd.v9i1.16927

Aini, Nur Aisyah, A Syachruroji, and Nana Hendracipta. *Development of LKPD based on Problem Based Learning in Science Subject Style Material*. Journal of Basic Education 10, no. 1 (2019): 68–76. https://doi.org/10.21009/JPD.081

Akmaliah, V. Z., & Rayungsari, M. (2024). *Analysis of the Needs of Interactive Mathematics Learning Media Development Based on Book Creator*. Mega: Journal of Mathematics Education, 5(2), 761-769. https://doi.org/10.59098/mega.v5i2

Amalia, A. R., Aqida, A., & Aidah, S. (2025). *Digital citizenship as an effort to prepare for the challenges of technological development*. Indonesian Character Journal, 2(1). https://doi.org/10.21512/ici.v2i1.12262

Astuti, D. P., Nuraini, N. L. S., & Roebyanto, G. (2021). *Development of Android-Based Interactive Multimedia with a Problem Based Learning Model of Mathematics Content for Building Materials for Classroom V Elementary* School. Journal of Learning, Guidance, and Educational Management, 1(8), 653-659. https://doi.org/10.17977/um065v1i82021p653-659

Dr. Riduwan, MBA. (2018). *Measurement Scale of Research Variables*. In , 12 ed., 6 11. https://cvalfabeta.com/product/cskala-pengukuran-variabel-variabel-penelitian/

Fawwaz, M. I., Akbar, M. F., Churiyah, M., & Sholikhan. (2022). *Improving the Competence of Elementary School Teachers Through the Development of Interactive Learning Media*. Prima: Community Service Research and Innovation Portal, 1(4), 171–178. https://doi.org/10.55047/prima.v1i4.349

Fransisca, S., Hendracipta, N., & Syachruroji, A. (2022). *Development of Interactive Learning Multimedia Based on Articulate Storyline 3 to Improve Learning Outcomes in Animal and Plant Body Function Structure Materials in Grade IV Elementary School*. Primary: Journal of Elementary School Teacher Education, 11(4), 1149-1157. https://doi.org/10.33578/jpfkip.v11i4.8604

Habibie, A. F., Sahfitri, F. N., & Mandalika, W. D. (2023). *The interactive learning media "Batik Pedia" is based on an android application on the Nusantara Batik encyclopedia*. Journal of Computer Information Technology and Information Systems (JUKTISI), 2(2), 326-338. https://doi.org/10.62712/juktisi.v2i2.74

Hidayati, R., Triyanto, M., Sulastri, A., & Husni, M. (2022). *The factors causing the decline in the motivation to learn of grade IV students of SDN 1 Peresak*. Journal of Educatio Fkip Unma, 8(3), 1153-1160. https://doi.org/10.31949/educatio.v8i3.3223

Islamiyah, E. S., & Qodariah, L. (2022). *Number Pocket Teaching Aids and Their Impact on Mathematics Learning Outcomes on Number Place Value Material*. Scientific Journal of Education and Learning, 6(2), 294-304. https://doi.org/10.23887/jipp.v6i2.4731

Maharani, P. P. D. (2021). *Development of Interactive Dynamic Work on Vector Materials as Online Learning Content in Class X at SMA Negeri 1 Blahbatuh* (Doctoral dissertation, Ganesha Education University). https://doi.org/10.5281/zenodo.5672530

Malihah, S., & Yuhana, Y. (2024). *Analysis of Misconceptions in the Value of Number Place in Grade 3 of Elementary School*. Pendas: Scientific Journal of Basic Education, 9(1), 1557-1565. https://doi.org/10.23969/jp.v9i1.11388

Manekatami, L. M., & Mariah, S. M. S. (2023, December). *Improving the Learning Outcomes of Grade 3 Students Numeracy Material with Place Value Board Media*. In Proceedings of the National Seminar on Professional Education Guru (Vol. 2, No. 1, pp. 451-455). https://doi.org/10.17509/pedadidaktika.v11i3.77090

Matitaputty, C. (2018). *Students' Misconceptions in Understanding the Concept of Place Values of Two Numbers*. Mosharafa: Journal of Mathematics Education, 5(2), 113–119. https://doi.org/10.31980/mosharafa.v5i2.266

Mulyadi, M., Atmazaki, A., & R, S. (2019). *The Development Of Interactive Multimedia E-Module On Indonesia Language Course*. 178 (Icoie 2018), 291–295. Https://Doi.Org/10.2991/Icoie-18.2019.65

Murni, D., Mudjiran, M., & Mirna, M. (2023). *Analysis of Teachers' Creativity and Innovation in Making Elementary School Mathematics Learning Media*. Journal of Scholars: Journal of Mathematics Education, *7*(2), 1118-1128. https://doi.org/10.31004/cendekia.v7i2.2066

Naja, D. U., & Auliya, N. N. F. (2023). *HTML5-Based Interactive Mathematics Learning Media in Building Spaces Using Articulate Storyline 3*. Trigonometry: Journal of Mathematics and Natural Sciences, 1(1), 1-10. https://garuda.kemdikbud.go.id/journal/view/34152

Nisaa, Roisatun, Yuniawatika Yuniawatika, and Surayanah Surayanah. 2024. *Analysis of the Need for Mathematics Teaching Materials for Flat Building Materials for Grade III Elementary School*. JIPM (Scientific Journal of Education https://doi.org/10.25273/jipm.v12i2.18184.

Nuraini, N. L. S., Cholifah, P. S., Permata, S. D., Aurelia, D., Nabilla, S., & Huzaimah, C. (2025). *Exploration of numeracy in digital cultural content.* https://educationalchallenges.org.ua/index.php/edc/article/view/4497

Nurhayati, H., Hendar, H., & Wulandari, W. (2021). *To improve students' understanding in mathematics subjects on the introduction of the concept of the smallest common multiple (KPK) by using the media of number dakon*. Journal of Tahsinia, 2(2), 180–189. https://doi.org/10.57171/jt.v2i2.7019

Nurhidayah, A., Mawarsari, V. D., & Suprapto, R. (2025). *Systematic Literature Review: The Use of Articulate Storyline Media in the Geometry Thinking Ability of Junior High School Students*. Innovative: Journal Of Social Science Research, 5(1), 6866-6885. https://doi.org/10.31004/innovative.v5i1.17881

Nursyam, A. (2019). Increasing students' interest in learning through information technology-based learning media. *Expose:* Journal of Legal and Education Research, 18(1), 811-819. https://doi.org/10.30863/ekspose.v18i1.371

Puspitasari, I. A., Azainil, A., & Basir, A. (2022). *The use of learning media in the problem-based learning model in mathematics subjects*. In Proceedings of the National Seminar on Mathematics Education, Mulawarman University (Vol. 2, pp. 75-92). https://jurnal.fkip.unmul.ac.id/index.php/psnpm/article/view/1248

Prijanto, J. H., & De Kock, F. (2021). *The role of teachers in efforts to increase student activity by applying the question and answer method to online learning*. Scholaria: Journal of Education and Culture, 11(3), 238-251. https://doi.org/10.24246/j.js.2021.v11.i3

Risky, S. M. (2019). *Analysis of the use of video media in science subjects in elementary schools. Elementary School: Study Educational Theory and Practice*, 28(2), 73–79. Https://Doi.Org/10.17977/Um009v28i22019 P073

Safitri, O. N. (2022). *Development of Interactive E-LKPD Teaching Materials Media Using the Wizer Website. me on Social Studies Learning Materials for Various Work Theme 4 Grade IV SDN Tanah Kalikedinding*

II. Journal Research Education Teacher School Basics, 10(1), 86-97. https://doi.org/10.26740/jpgsd.v10n1.p86-97

Sahid, Nurdin Wahyu, Martyana Prihaswati, and Venissa Dian Mawarsari. 2024. *Perception of Junior High School Students and Teachers Towards the Use of Technology-Based Mathematics Learning Media*. AXIOM: Journal of Mathematics and Mathematics Education 15 (1): 125 38. https://doi.org/10.24127/ajpm.v15i1.5376

Sari, I. N., & Sulisworo, D. (2023). *Development of augmented reality-based LKPD as a mathematics learning medium*. JNPM (National Journal of Mathematics Education), 7(1), -11. https://doi.org/10.33603/jnpm.v7i1.5347

Setiawan, Y. U., Yandari, I. A. V., & Pamungkas, A. S. (2020). *Development of Fractional Domino Cards as a Mathematics Learning Media in Grade IV of Elementary School*. Primary: Journal of Basic Science and Education, 12(1), 1-12. https://doi.org/10.32678/primary.v12i01.2706

Utami, Y. S., & Wahyudi, W. (2021). *Development of interactive media based on articulate storyline in thematic learning of grade V elementary school students*. Journal of Basic Education Research, 4(1), 62-71. https://doi.org/10.26618/jrpd.v4i1.5056

Yati, Y., Aminuriyah, S., Khasanah, S. U., Hidayati, Y. M., & Desstya, A. (2023). *Development of Articulate Storyline-Based Mathematics Learning Media on Value Material Where Two Numbers Are* Placed. Pendas: Scientific Journal of Basic Education, 8(1), 3991-4005. https://doi.org/10.23969/jp.v8i1.7019