Macromedia Adobe Flash for Recognizing Letters and Numbers in Children Aged 5-6 Years

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ABSTRACT.

This research is development research, which aims 1). produce products in the form of Macromedia applications *Adobe Flash* as a medium for overcoming difficulties in learning to read the beginning of letters and numbers for children aged 5 to 6 years 2) to determine the effectiveness of the program Macromedia Flash application as a medium for overcoming difficulties in learning to read the beginning of the alphabet and numbers for children aged 5 to 6 years. The feasibility of learning multimedia in terms of media content, use of language, sound and appearance, efficiency, and validation of material experts and media experts and practitioners. At the implementation stage, feasibility is reviewed from the aspects of media content, material structure, evaluation, systematics, presentation, use of language, sound and appearance, and efficiency, which are as parents and children assessed subjects were 27 RA kindergarten children Ma'arif Candran Yogyakarta. The development model used in this research is the 4D model.[1]Which consists of 4 stages, namely 1). define; (2) design; (3) development; and (4) dissemination. The results showed that Macromedia Adobe Flash proved feasible to implement and could be used to overcome difficulties in learning to read early in children, as evidenced by the assessment of media experts, learning material experts, and practitioners because they obtained a percentage score of more than 75%. The results of a limited trial conducted on 27 students showed that this learning application product effectively overcame learning difficulties in reading letters and numbers by obtaining a percentage score of more than 85% and showing significant results.

Keywords: Adobe Flash, beginning reading, Children aged 5-6 years

1. INTRODUCTION

The ability to read is one of the primary keys to school success and an essential component of empowering children to participate meaningfully in society. However, for many children, reading skills are a challenge to acquire. Around 250 million children globally cannot acquire basic literacy skills (UNESCO).[2].This implies that all parties need to

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understand the importance of early childhood for optimizing growth and development. One of the potentials that can be developed in early childhood is language development; according to Bromley in Dhoni, language is an organized symbol system for transferring various ideas and information consisting of visual and verbal symbols.[3] Various efforts can be made to improve the ability of early reading aspects through engaging and exciting learning activities. This can influence the development of critical thinking and creativity in children.[4].Reading is one of the most important skills because it is the foundation for daily life, academic, and career achievement[5]. Readiness to read shows a child's developmental maturity and readiness to read efficiently and competently, such as recognizing letters, adding new vocabulary, and making it easier for children to learn to read for further education.[6]. Beginning reading is the initial stage before a child can read.[7]. Beginning reading is also the lowest stage, where children are taught to recognize and spell letters at this stage.[7].

This research is motivated by the difficulties teachers, parents, and children face in implementing learning to read early childhood letters and numbers at Kindergarten Ma'arif Candran Yogyakarta. The problem children face in learning to read is that the teacher only uses limited media, namely children's worksheets, letter cards, number cards, and textbooks, without using fun media in learning so that students learn in a monotonous atmosphere. Learning that is carried out is more dominantly centered on the teacher so that students are less active during learning activities. In addition, students' low numeracy skills are due to a need for learning media that can facilitate children's independent learning. If reading difficulties are not identified and addressed in the early grades in schools, they may face significant problems and affect future learning.[8]. Parental involvement at home in literacy development is the most essential resource for early language recognition for young children.[9]Longigan and CJ Burgess believe that children with literacy skills will have better academic results.[9]

Given these problems, media is needed to improve the quality of learning while attracting students' interest in learning. This learning media is designed and adapted to technological developments that feature a combination of text, sound, images, and video, namely Adobe Flash Macromedia learning media. Meanwhile, Widyaningsih stated that media use is essential in learning as part of the media to help teachers facilitate the learning process and make it more meaningful.[10]Wulan and Silmi, the medium of puzzles/crosswords effectively improves and grows students' character through exciting and fun learning.[10]Through playing activities, children can practice their language skills by listening to various sounds, pronouncing syllables or words, expanding vocabulary, pronouncing symbols of numbers or numbers, speaking according to Indonesian grammar, etc.[11] Early reading learning for children must be by the child's world, attached to play activities.[13] The development of the Macromedia Flash application as a medium for overcoming difficulties in learning to read the beginning of the alphabet and numbers for children aged 5-6 years makes it easier for teachers and parents to learn because this program contains menus of options for learning to read simple letters and numbers. This material is packaged in games, such as videos, letter guessing quizzes, letters

without spelling, reading numbers, and guessing numbers by imitating sounds. Based on its characteristics, this application is also classified as mobile learning because it can be accessed via an Adroit cellphone and used anytime and anywhere. Munir stated that high-quality learning media could improve the quality of education. Munir further stated that the presence of attractive media could improve the quality of learning.[14].A critical aspect of language developed in early childhood for the next level of education is the ability to recognize letters, which can later develop into the ability to read words.[15]. Adobe Flash is a product/software from Adobe used to create and process animations or images that use vectors on a small scale.[16]. Software that can be used to create images and writing will expand children's use of graphic symbols and the alphabet. Software containing animated stories will expand children's listening comprehension.[17]In Indrawan Dwi Bramastya's research, the Android application can display letters and their pronunciation, hold quizzes, and have animations and punctuation.[18]. Cathy Nutbrown and Peter Clough stated that the ability to read and write encourages children to associate sound and writing and start reading and writing.[17]. Dini's opinion, Taulany The industrial revolution 4.0, which marks the arrival of the digital era, not only affects the lives of every human being but is also used in the world of learning, including early childhood education.[6]Therefore, teachers are required to be able to apply technology to early childhood learning to read.

Here, the role of ECE institutions is vital, especially in maximizing the development and growth of children through proper stimulation.[19] To overcome this problem, it is necessary to develop a Macromedia Flash application program to overcome difficulties in learning to read the beginnings of letters and numbers for children aged 5-6 years in TK RA Ma'arif Candran Yogyakarta.

2. RESEARCH METHODS

Research titled "Development of Macromedia Adobe Flash Learning Media for Beginning to Recognize Letters and Numbers for Children Aged 5-6 Years. This research is a type of development research or R & D (Research and Development) commonly used to produce and test the validity of certain products. The research design uses the 4D (four-D) development model, which consists of 4 stages: define, design, develop, and disseminate development and deployment.[20]. The research was carried out from November to April 2023 at TK RA Maarif Candran Yogyakarta.

Development Procedure

The steps for research and development of Macromedia Adobe Flash media are as follows: a). The Define stage includes activities (1) analyzing the general characteristics of the target group and (2) formulating learning objectives. These two activities used class analysis, curriculum study, and theory study. The results of this study are used to prepare product specifications to be developed.

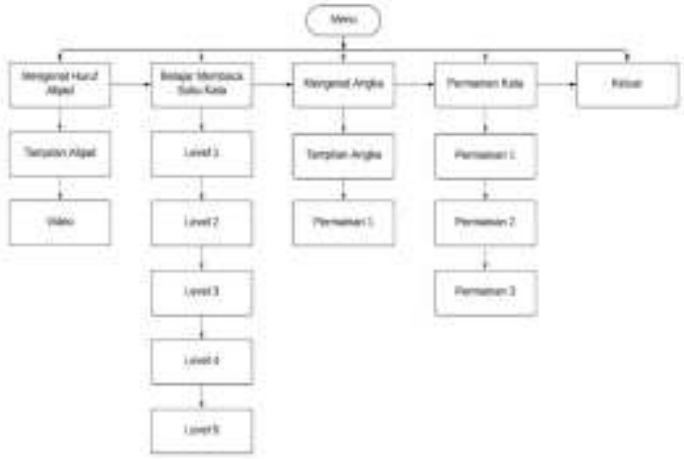

Figure 1 Menu structure

b). The design stage (design) contains the activities of designing or designing the media that was designed at the previous stage

c). The development stage by preparing products from all materials has been prepared. Product prototypes have been tested and asked for responses from learning media experts, material expert validation, and practitioners (classroom teachers). Researchers will later use these responses in revising the product before it is disseminated. The program used in compiling the product is:

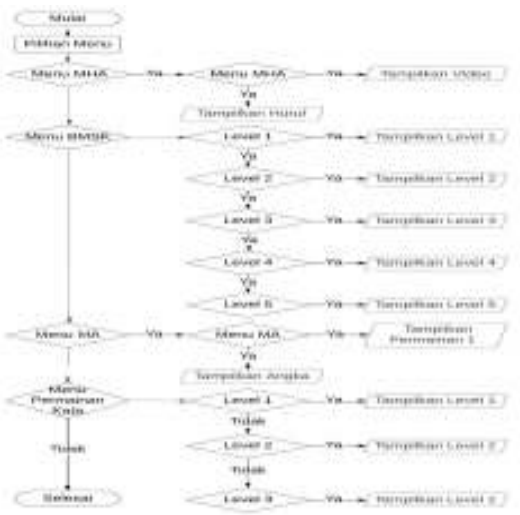

Figure 2. Application Flowchart Structure

d). The dissemination stage is the product dissemination stage. Products that have been revised are then disseminated via the internet and can be downloaded free of charge.

The data in this research is in the form of verbal and numerical data. Verbal data at the pre-development stage was obtained from interviews and observations aimed at teachers, parents, and students. Verbal data at the product testing stage takes the form of comments, criticism, and suggestions from media and material experts in the validation questionnaire. Verbal data at the class/field testing stage were notes on observations of responses, reactions, and comments from teachers and parents regarding product prototypes that had been tried. Meanwhile, numerical data is obtained from the results of assessments by media experts, material experts, and practitioners.

In the definition stage, the data collection techniques were observation and open interviews with class teachers and parents of kindergarten students aged 5-6. Meanwhile, interviews were conducted to obtain data from teachers regarding the program used. In addition, interviews were conducted with kindergarten children aged 5 -6 years to determine the use of the Adobe Flash application among students.

In the expert test stage, the data collection technique used was a questionnaire (questionnaire) to obtain verbal and numeral data. Product validation questionnaires were given to media experts, material experts, and practitioners to assess the product being developed.

At the product testing stage, the data collection technique used was interviewed. This technique determines teachers' and students' responses, reactions, and comments when using the prototype Adobe Flash application in learning. From this technique, numerical data and verbal data are obtained.

Data analysis in this research was conducted using qualitative and quantitative techniques. Qualitative data analysis was divided into three, namely (1) preliminary study data analysis (identification), (2) expert and practitioner test data analysis, and (3) trial data analysis on trial subjects. Quantitative analysis techniques were obtained from assessment questionnaires. The quantitative data results are calculated using the following simple quantitative formula.

$$P = \frac{\sum x}{\sum xi} x100\%$$

Information:

P =Percentage

∑x = The total number of respondents' answers in all items

∑xi =The total maximum score in one item

100% =Constant

MarkThe results of the respondent data are then interpreted according to the guidelines in the table below.[13]

Table 1. Guidelines for Interpreting the Quality of Learner Media[21]

Presentation	Qualification	Follow-up
85%-100%	Very Worth It	Implementation
75%-84%	Worthy	Implementation with minor revisions
55%-74%	Decent Enough	Revision according to notes from media experts and material experts
<55%	Not Worth It	Revision with changes

3. RESULTS AND DISCUSSION

This research is development research that produces a learning media product in the form of a media-based learning Macromedia application, Adobe Flash*, which* recognizes letters and numbers. This learning media is made to help teachers and parents in the learning process activities. This Adobe Flash-based learning media is a learning media in which there are components such as images, text, sound, etc. The research results with the title "Development of the Macromedia Adobe Flash Application Program as a medium for

overcoming difficulties in learning to read the beginning of the alphabet and numbers for children aged 5-6 years in KB, Kindergarten, RA Ma'arif". The product developed in this research is the Adobe Flash application, which is exciting and easily understood by children, teachers, and parents. Application programs Adobe *flash*This can be accessed on an Adroit-based smartphone or tablet so students can study independently wherever and whenever. Reading the beginning will be more fun, increasing student interest and motivation. Through this application, learning to read will be more enjoyable so that children will not feel bored and can choose menus according to their wishes. Applications for learning to read the alphabet and numbers are developed using the educational games model. That is, the application contains learning material packaged as a game.[13]The types of games used in this application consist of 1) a Game Menu, 2) an alphabetical menu, 3) a syllable reading menu, 4) a number reading menu, and a wordplay menu[22].

Figure 3. is the image of the main display menu of the Adobe Flash program. Learn to read while playing. The types of games used in this application consist of 1) Get to Know the Alphabet: alphabet and videos, 2) Read syllables, 3) Read Numbers: get to know numbers and number puzzles, 4) Wordplay: Guess words, Figure words, string words.

Figure 1. Menu Display

Figure 2. Exit menu

Figure 3ab on the display menu (main menu view) contains controls for various functions such as creating, opening, exiting, games, knowing the alphabet, reading syllables, reading numbers, and playing words. At the same time, the application used in this study uses Android-based Adobe Flash.

Figure 3. Recognizing the alphabet

Figure 4. Video images

Figures 4a and 4b of the alphabetical menu are the initial stages in which students are introduced to the initial letters with sounds that match the letter and its shape. Apart from that, students are shown various letters and how to read them (if a letter is clicked, a sound will appear according to the letter designated), then get to know the vowels, namely aiueo and videos containing Figure s of animals accompanied by letters combined with names

objects according to the letters of the alphabet, for example, the letter a- a Figure of a chicken, b a Figure of a duck, c a lizard, d a sheep, e an eagle, etc.

Figure 5. Read the syllables

Figure 6. Read two syllables

In Figures 5 and 6, students can choose from the wordplay menu's various syllables and syllable fragments. The designated writing will sound according to the existing writing by touching the screen. From this lesson, students are expected to be able to read fluently. As Montessori's opinion in Susan Feez, children aged 4½-6 years are in a sensitive period for learning to read because they already have reading readiness or an emerging interest in reading. Papalia stated that reading to children is one of the most effective ways of literacy. Salehudin's research on literacy found that there is a unidirectional relationship, which means that if the facilities (internet, smartphone, notebook/PC) are adequate or satisfying, coupled with support and guidance directed by parents and family at home will foster a positive attitude in digital literacy from an early age.

Figure 7. Read the numbers

Figure 8. Number puzzles

In Figures 7 and 8, this application is made for students to practice reading numbers from 0 to 10, and students play number puzzles by drawing lines according to the letters and numbers. With the Adobe Flash media application, children will be more interested in learning numbers created with the concept of learning while playing. Knowing letters and numbers is very important for children because it can stimulate children's ability to learn to read and count[3]. The results of research by Amelia K. Moody, Ph.D. The benefits of digital e-storybooks can support reading skills, vocabulary development, comprehension, and phonology in early childhood through digital use.[9]

Figure 9. Guess the word

Figure 10. Figure word

Figure 11. String of Words

Figure 9 on the game menu item consists of three sub-items: charades, Figure words, and word sequences.

a. Figures 9a, 9b and 9c. Guess the Word: This sub-menu contains Figures s of people where if you

touch this figure, it will make a sound according to the sentence and Figure. Students listen to the sounds that come out of the props. Then, students match the sounds that come out with the figures of the animals. Several animal images are displayed on the screen, so many choices are available. If the student touches the Figure of the animal, the word will come out according to the image being pressed, which does not match the sound being heard. The student can repeat by pointing at the image until it is correct. If it is wrong, a notification will appear that the designated image is wrong, and vice versa. If you point to the correct image, a notification will appear correctly. And so on, until the game is finished, a value or score will be obtained at the end of the quiz. As Ahmad argues, interactive multimedia tools will significantly improve reading skills among students with certain learning difficulties. Therefore, teachers must be prepared with fun activities and various teaching methods and plan their instruction according to children's abilities[2]

Figure 12. Display if answered correctly

b. Figure word**:** In this Figure sub-word, students are given a game by pressing the Figure of an animal, which will repeatedly sound according to the Figure. Students are given a choice of words from what is heard and seeing the figures. For example, an image of an ELEPHANT will appear on the screen, and if you touch it, the sound of the word elephant will appear. From this game, students are expected to be able to point and read words correctly according to the Figures and sound they hear. At the end of this game, students can see the value obtained, while the assessment, if correct, all get a score of 100. The game contributes significantly to children's development at every stage. Games can be defined as "activities performed for entertainment or pleasure.[23]Games are also effective in enriching vocabulary, expressing emotions and thoughts well, speaking in public in a relaxed manner, tone of voice, adjusting the stress of words, and listening and understanding other people.[24]

Figure 13. Word Figure

c. Stringing Words**:** In the sub-menu of putting words together in Figure 12, students learn while playing putting words together according to the Figure s, for example, a Figure of a watermelon, so students are invited to put together the word watermelon, a Figure of papaya, so students put together the word pe-pa-ya.

Figure 12. Word chain

Test Result Data from media experts and experts

The results of the media, material, and practitioner expert test stages, numeral, and verbal data were obtained from the results of experts and practitioners on learning application products. Obtained from the results of the questionnaire that has been given. In the questionnaire, there are seven aspects consisting of (1) media content, (2) material structure, (3) evaluation, (4) presentation systematics, (5) use of language, (6) use of sound and image display (7) efficiency.

As for the results of the assessment of media experts and material experts in Table 2 below:

Table 2 Numerical Data and media experts, material experts, and practitioners

Aspect	A1	A2	P	Total Score	Percentage	Note
Media Contents	28	26	28	82	85.4 %	I
Structure of Matter	7	11	11	29	80.56 %	I/R
Evaluation	6	7	8	21	87.50%	I
Serving systematics	6	7	8	21	87.50%	I
language use	15	13	13	41	85%	I
Sound and display	23	25	24	72	85.71%	I
Efficiency	18	23	22	63	87.11%	I

Information

A1 : Expertmedia
A2 : Expertmaterial
P : Practitioner
I : R implementation

Based on Table 2, it can be seen that the contents of the Macromedia application menu Adobe Flash As a medium to overcome difficulties in learning to read the beginning of letters and numbers for children aged 5 to 6 years old, the learning application product numbers are worthy of implementation because they get a percentage of more than 75%, however, for the presentation of a slight revision by the input of media experts. Media experts say there are examples of learning applications not by essential competencies, so they must be replaced with words or letters that students can understand. Apart from the numerical data presented in Table 2, verbal data is collected based on comments and suggestions from experts and

practitioners. Comments and suggestions were also obtained in writing through an assessment questionnaire given to experts and practitioners. The verbal data is presented in the following table:

Table 3. Verbal data from experts and practitioners

Source	Comments and Suggestions from Experts and Practitioners
A1	Core competencies, essential competencies, indicators, and materials are appropriate.
	The video about recognizing the letters of the alphabet is by the learning material without spelling.
	Learn to read syllables. Some examples in the learning menu while playing syllables combine inappropriate and poorly understood syllables, for example, in words assembling and so on.
	The application is easy to use, and the material selection is appropriate for kindergarten students' development.
A2	This type of Figure guessing game is the learning material for early childhood ages 5 to 6 years.
	The use of language is good and by the characteristics of students.

Information:

A1 : ExpertMaterial
A2 : Media expert learning

Limited test results data

Limited class testing was carried out at Ma'arif Candran Kindergarten with 27 students. Class test results data were obtained through observation techniques carried out by two people. Observations were made when students learned to read using the Macromedia flash program's initial alphabet and number learning application. During this activity, the observer observes teachers, parents, and students' responses, reactions, and comments towards the application. Observers observe four aspects: 1) media content, 2) use of language, 3) use of audiovisuals, and 4) efficiency. The data from these observations are presented in Table 4

Table 4. Class observation data

Aspect	Score	Percentage	Note
Media content	27	87.5%	Implementation
Language Usage	8	88.6%	Implementation
Sound and display	41	87.5%	Implementation
efficient	15	92.7%	Implementation

Based on the observation results shown in Table 4, it can be seen that the four aspects obtained a percentage of more than 85%. This shows that the learning application product tested on kindergarten students is feasible.

Product Revision

Product revisions are carried out based on percentage values obtained from the results of assessments by media, material, and practitioner experts. Based on the results of this assessment, the material structure aspect is categorized as feasible for implementation. This is based on obtaining a score percentage of 80.56%. When making product revisions, the learning application product specifications must consider comments or suggestions from experts and practitioners.

Aspects of learning structure include learning to read syllables

. Some examples on the learning to read syllables menu combine syllables that are inappropriate and poorly understood by students. Based on these comments, improvements were made by changing the examples of words intended by material experts and practitioners.

CONCLUSION

1. Development of Adobe Flash Macromedia learning media for the beginning of recognizing letters and numbers adapted to the analysis of the needs of teachers and students;
2. Data from Expert and Practitioner Test Results for products Flash Macromedia media learning was obtained from the results of the given questionnaire. The result contents of the Macromedia application menu Adobe Flash As a medium for overcoming difficulties in learning to read the beginning of letters and numbers for children aged 5 to 6 years, learning application products are worthy of implementation because they get a percentage of more than 75%
3. Based on the results of class observations, it can be seen that the four aspects observed obtained a percentage of more than 85%. This shows that the learning application products tested on Kindergarten students are feasible to implement and very effective in overcoming the problems of learning to read the beginning of letters and numbers for children aged 5 to 6 years at RA Maarif Candran Kindergarten, Yogyakarta.

SUGGESTION

Based on the results of research, analysis, discussion, and trials on Macromedia Adobe Flash Learning MediaAdroit-based for learning to read the beginning of letters and numbers for children aged 5 to 6 years, so for the development of further research, the authors suggest the following:

1. Macromedia Adobe Flash Learning Mediathis is still far from perfect, while technology continues to develop rapidly. Therefore, this learning media continues to be developed to suit the needs of the educational curriculum.
2. The school should facilitate learning in the classroom by providing supporting facilities so that the quality of education that takes place can be effective and efficient and get optimal results
3. Educators need to integrate the main principles of early childhood education with gameplay, which includes supporting children's interaction with technology through technology interaction under guidance.[25]

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