Development of Game Based Learning for Toba Batak Script Learning Media With Multimedia Development Life Cycle (MDLC) Model Tonni Limbong 1,2,a) , Efendi Napitupulu 2) , S Sriadhi 2) 1 Faculty of Computer Science, Universitas Katolik Santo Thomas, Medan, Indonesia 2 Postgraduate, Universitas Negeri Medan, Medan, Indonesia a) Corresponding author: tonni.budidarma@gmail.com Abstract.

Game is a medium that can be used in the learning process to stimulate students in teaching and learning activities in the cla ssroom. The development of technology is always a lot of innovation and progress very quickly. Playing is the activity most liked by children, besides playing, children need to get a learning process that is usually done at school.

One of the innovations i s the development of games that have been adapted to the needs of learning in the classroom called game based learning or educational games. Toba Batak Script is a subject which is a subject that is directed to encourage, guide, develop and foster abilitie s and foster a positive attitude towards the Toba Batak language, both receptive and productive. Receptive ability is the ability to understand other people's speech and understand reading.

Productive ability is the ability to use the language of communica tion tools both orally and in writing, so the use of learning media is needed to attract students' interest in studying the subject. In this study, an educational game was used which consisted of writing, reading, listening which was built using the Action Script 2.0

programming language from Macromedia Flash CS6. The research steps are potential and problems, data collection, design validation, product design, design revisions,

product trials, product revisions, final products. Based on the results of the research, game based learning applications are declared valid and suitable for use in learning Keywords: Game Based Learning, Education, Learning, Batak Toba Script INTRODUCTION In this century, the use of information and communication technology has increased sharply and has begun to penetrate all fields, including its use in the field of education [1].

In the world of education, ICT is needed to make the teaching and learning process between teachers and students more informative, creative and innovative because the teaching and learning process in the classroom determines the level of success of students and teachers. The implementation of ICT in education is to apply online learning to curriculum -based educational games or a game that has been adapted to the learning process [1].

Game based learning is a game that is deliberately made for educational purposes as a support for learning media, because it is considered more interesting than the conventional teaching and learning process. Game based learning is proven to improve student achievement and support the educational process[2], [3]. This relates to the design used in educational games, which consists of animation, selection of appropriate colors and interesting illustrations (objects) at each stage of learning or each topic in learning which is then applied to educational games with the aim of stimulating Elementary school students to love subjects that are difficult to understand, namely in this study the subjects of the Batak scr ipt, where these subjects are universal languages that must be understood since elementary education. Students who are currently receiving primary education tend to still prefer games to the monotonous and theoretical learning process in the classroom.

So it takes the right learning media to stimulate students' learning abilities[4]. The making of game learning is adjusted to the level and curriculum where the game learning is applied. In this study, a case study of the application of game learning was carr ied out at a school in Humbanghasundutan Regency, namely the State Elementary School (SDN 173395 Doloksanggul), and applied to Thematic Subjects (local culture) which were adapted to the subject curriculum.

Among them consist of theories such as reading, w riting sentences / writing, choosing the right answer to complete true and false (alphabets, animals, fruits, colors), and matching pictures with the correct Toba Batak script. The ability of students in the classroom to study the Toba Batak language scrip t using educational games will be measured and then displayed on the scoreboard, to stimulate the competitiveness of students to continue to learn to be the best. The Batak script belongs to the Indian

writing family.

The oldest Indian script is the Brahmi script which derives two groups of writing, namely North Indian and South Indian. The Nagari and Palawa scripts come from the northern and southern groups respectively and have both been used in various places in Southeast Asia, including Indonesia, the most influential being the Palawa script.

All original Indonesian writings are rooted in this script [5] At first the Batak script was only understood and understood by a very limited circle of people, namely magic and medicine experts (datu or guru). The original script is actually increasingly different in the books written by writers lately. So that people will find it difficult to read Pustaha's original text if they rely on recent writers, who only have enthusiasm without adequate references.

However, i t must be appreciated. Only now is the time to correct it so it doesn't drag on. Actually it originally happened because of the many versions of Batak writings [6] some of them are made by: 1. Herman Neubronner van der Tuuk, a Dutch linguist, who publishe d the book "About the Writing and Pronunciation of the Toba Language" (Overschrift en Uitspraak der Tobasche Taal, 1855). before the arrival of Nommensen. 2.

The German Zending Printing Version since 1873, which is based on the van der Tuuk version, trans lates the New Testament and the Old Testament in Batak script 3. Landsdrukkerij Printing Version since 1885 printing school textbooks 4. The government -made version of "Surat Pustaha", which is getting further and further away from the original form.

Currently, there are still many problems that arise in learning activities in schools. For example, students are less interested in lessons, students tend to be passive in the learning process, students feel bored to learn and so on. This is because the learning process generally does not use media, teachers usually use the lecture method so that only the teacher is active, while the students are passive. In fact, over time, there are many types of learning media on the market. Educators can easily get it.

Con sidering the cost of obtaining learning media, which does not have a slight impact on schools whose category is underprivileged, may not be able to take advantage of these media. For this reason, teachers are required to be more creative in creating and fi nding learning media with cheaper categories. On the other hand, many teachers think that learning media is not too important in the learning process.

Many think that making learning media is just a waste of time and energy. Because the

most important thing for teachers is how to teach and explain lessons in class correctly. They think there is no need to bother making learning media because it is not too important. Teachers think they don't want to bother preparing learning media [7].

The game may be famil iar today because it is a question and answer game between the answerer, it can be done with two or also in groups. In addition, all questions and questions mostly contain poetry and rhymes "not real words" with the aim of increasing analytical skills and of course very fun, besides being useful for remembering popular vocabulary, but also useful for general knowledge in a relaxed way.

Answering a riddle question makes the answerers think to find answers. If you haven't found the answer, then curiosity hits and looks for ways to solve it [2], [7] The way to apply puzzles as learning media is that the teacher first demonstrates the puzzle game to students in front of the class, then tells how to play and the rules.

Before the teacher demonstrates the game, th e teacher makes puzzles according to the material to be taught. After the material is prepared, the teacher makes a question in the form of a rhyme or poem and only a short answer, for example the types are synonyms, antonyms, or acronyms and so on [4].

Media games have advantages including more active and creative students, for example, students are asked to make puzzles by the teacher, so like it or not, students have to think about looking for material in the chapter that will be made for puzzle questi ons by reading, even though what is read is not all of them in the chapter at least they studied the material to make questions and find answers.

Furthermore, when you are at school or in class, you exchange the results of making puzzles between friends and teach them to look for answers, in the process of finding answers, the students' brains must be active, for students who do not know, they become aware by matching the answers with those who make the questions. In the application of this puzzle media, the teacher must monitor intensively so that the atmosphere in the class is not noisy, remains conducive and learning goes on [8], [9].

The application of puzzle media has benefits, namely to increase students' activities and learning outcomes because in fil ling out answers a clear, relaxed and calm state of mind will make brain memory strong, so memory will increase. In addition to the game [3]. These puzzles make students think and also seek and find answers in a fun but sometimes confusing way to solve the puzzles.

Filling in puzzles actually refreshes the mind and adds insight and can even hone brain

abilities and often filling in answers will be able to improve the functioning of the human brain and prevent premature senility[10]. METHODS Research method is an overview of the stages carried out in conducting a research or conducting a software design.

In a product or multimedia -based learning media, there are not always all the objects mentioned above, there may only be one or two objects, but there can al so be all objects in a learning multimedia product. The portion of giving each object is of course adjusted to the learning needs in the development of multimedia products for learning[11].

he manufacture and development of multimedia products for learni ng can follow the stages of the Multimedia Development Life Cycle (MDLC) [12], by following this development stage it can produce quality multimedia products by using media objects with the right proportions for learning. FIGURE 1. Multimedia Development Life Cycle (MDLC) Model As shown in Figure 1, the stages in the prototype method that will be applied in this study consist of 6 interrelated stages and occur in a rotating cycle, starting from the data collection/consultation step b etween customers and developers, followed by system analysis, coding, and maintenance.

In the prototype method, the maintenance stage is not the final stage of the software development process, which is a cycle back to the initial stages, namely data collection consisting of consultations and interviews if version development is needed or an error occurs in the software being developed[14] . 1. Concept The concept stage is to determine the purpose and who are the program users (identification audience), t ypes of applications, application objectives, and general specifications. The basic rules for the design are also determined at this stage, such as application size, target, etc. 2.

Design Design is to make detailed specifications regarding the applicatio n architecture, style, appearance and material/material requirements for making applications. The specifications are detailed enough so that in the next stage, namely collecting and assembly materials, no new decisions are needed, but use what has been det ermined at the design stage.

However, it is often the case that additional materials or application parts are added, removed or changed at the beginning of working on a game learning application. 3. Material collecting Material collecting is the stage of collecting materials according to the needs being worked on. These materials include clip art images, photos, animations, videos, audio, and others that can be obtained for free or by ordering to other parties according to the design. This stage c an be done in parallel with the assembly stage. 4.

Assembly The assembly stage is the stage of making all multimedia objects or materials.

Making applications based on storyboards, flow charts, and navigation structures originating at the design stage. 5. Testing After the application is made, it is time to test the capabilities and performance of the application, whether it is as expected. Here, we review (recompile) whether all links, buttons, and other features can work properly. 6.

Distribution At this stage the application will be stored in a storage medium, this stage can also be called the evaluation stage for the development of finished products to make it better. The results of this evaluation can be used as input for the concept stage of the next product. RESULTS AND DISCUSSION The main purpose of making this learning game is to attract students' interest in learning the Toba Batak script.

That's why this game is made based on the applicable curriculum by applying four main categories, namely the ability to read, write, listen and speak. In addition, the game is also made by prioritizing an attractive appearance and easy to use by elementary school students. Furthermore, according to what has been described above, regarding the stages of the research method used, the implementation stage is the stage after the coding stage is carried out.

In the Batak language, the Toba Batak script is often called the 'sia -sia' or the 'sampulu sia' letter because the number of characters ('ina ni Surat') is ninete en. The alphabet has several sequences [5], [15], one of which is the modern version (which is used in this study) as follows: FIGURE 2. This is the modern version of the Toba Batak script a. 'Anak ni Surat' (child of Sentence) TABLE 1.

child of Sentence Name Script Read Hatadingan E Singkora I Haluaon ? O Saringar Ng Haborotan U b. 'Pangolat' and Punctuation " " = Serves to remove the vowel sound "a" in each main sentence ('Ina ni Surat') Example : AMAN = \ = Used to end a sentence c. Number TABLE 2.

Number Batak Toba Latin 1 2 3 4 5 6 7 8 9 10 In this study, the implementation of the system directly to students, and there are 2 display system implementation menus, namely the Learning Menu and the Exercise Menu using the Action Script 2.0 programming language from Macromedia Flash CS6 software to process theoretical data and questions that will be displayed in the game display (user).

Learning Menu The Learning menu is a menu that is used to view all Batak characters (main sentence, sentence children, 'pangolat' and numbers), then display Batak characters and sounds to explain the alphabet, animals, fruits, colors, and numbers, on

the Exercise menu is a form to display games. in 2 (two) forms, namely True False and Puzzles of alphabets, numbers, animals, fruits and colors.

The following display of student data menu can be seen in Figure 1 below. FIGURE 1. Display of Game Learning Main Menu For the main menu of game learning, it is equipped with Mp3 music, namely the Batak song "gondang mula.mp3" which will loop before being clicked by one of the class data but tons, if you click the start button it will enter the learning menu, while if you click the Exit button, the application will finish. FIGURE 2.

Learning Menu Display This display will appear when the Start button is clicked, equipped with Mp3 music, na mely the Batak song "O Tano Batak.mp3" which will loop before being clicked. This menu is a facility for students to study or exercise. Clicking the Exercise button will enter the Training menu (game) while if you click the Overview button about the Batak script, a little profile about the Toba Batak script will appear. FIGURE 3.

Learning Options Menu Display Through this side the user / student can choose the learning menu, namely Alphabets, Numbers, Fruits, Animals and Colors. The following display of t he Learning menu can be seen in Figure 4 below. FIGURE 4. Display of the Literacy Learning Options Menu This display is a learning menu to recognize the Batak alphabet, 'pangolat' and dot.

If you click on one of the alphabets, audio will come out about the pronunciation of the alphabet of each character that is displayed in the application, including how to use 'pangolat' in the Batak script. FIGURE 5. Display of the Number Learning Options Menu This display is a learning menu to recognize number s in the Batak script.

If you click on one of the numbers, audio will come out about the pronunciation of the alphabet and the shape of the letters to write down the numbers from each character displayed in the application. FIGURE 6. Display of the Fruit Learning Options Menu In this display, students learn and recognize the names of common fruits around the Toba area, each click on a fruit image presented will display the Toba Batak script and sound/audio for each image presented. FIGURE 7.

Display of Animal Learning Options Menu In this display, students learn and recognize the names of animals that are common around the Toba area, each click of the animal image presented will display the Toba Batak script and sound/audio for each image presented. FIGURE 8. Display of Color Learning Options Menu In this display, students learn and recognize the common colors around the Toba area, every color image

presented is clicked, a Toba Batak script will appear and sound/audio for each image presented.

Practice / Games The Menu for Training will be opened after clicking the Exercise button in the main menu, the screen below will appear. FIGURE 9. Initial Display of Student Data Collection Practicing In the student or user display menu, firs t enter the user name and enter the class, then click the Start button to start. FIGURE 10.

Display of Questions on the Practice menu Furthermore, after studying the theory in the theory menu, students can work on test questions on the Practice menu as shown in the image above. Questions can be done sequentially or allowed to go back to the previous question. To answer the practice questions, the user answers the question by clicking on the True or False answer, once the answer is given by the user, t he next question will appear. FIGURE 11. Display of Questions on the Practice menu with the Forward or Back button FIGURE 12.

Display of the Last Question with the Done button In the last question, the finish button will appear, if you click the fini sh button then the value will appear by displaying how many questions are correct and how many are wrong accompanied by the audio "Gondang Hasahatan.mp3", then the user or student may still click the repeat button if to repeat the exercise again. FIGURE 13.

Final Game / Practice Display with Score Display CONCLUSIONS The results of the research conducted, it can be concluded that this research can produce learning games for learning that can present material and questions as an evaluation of student learning, so that it can be an alternative means to support learning. The results of research and trials show that by making interactive Batak Toba script learning games, users find learning the Batak Toba script more fun.

After applying this educa tional game, students become more interested in the Batak Toba script subject. The display of learning media that is made more attractive can inspire students to continue to learn and hone their abilities. This is certainly very influential on student learning outcomes which are expected to be better than before. REFERENCES 1. E. R. Manik and T.

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