APPLICATION LEARNING TO KNOW THE CLOCK

Iwan Rijayana[1], Penitaliasih[2], Leyla Noor S[3]

[1,2,3]Engineering Faculty of Widyatama University

[1]iwan.rijayana@widyatama.ac.id

ABSTRACT

At the early age at around five, children will begin to learn about the characteristics of the time in general and specifically an hour consists of the minute hand and hour hand on an analog clock, or to read the numbers on the digital clock. At an early step in the beginning, we usually ask them to read the numbers on the digital clock. Perhaps, for them, the numbers are not significantly meaningful or valuable, but the children would be proud of because they have been able to read the clock. Then the next step would be a clock reading by the shorthand and longhand part on the analog clock. In order to make it easier in helping children learning to read the clock, then the application is required to be made as the learning device to read a clock. Application Learning to Know The Clock for children is a multimedia-based application using the *Android platform*. This application provides information and lessons on how to read an analog and a digital clock that can facilitate children in learning to read the clock. This application also provides some features such as pictures, text, and sound to facilitate children in learning to read a clock. This application also includes exercises and games to attract children in using this application.

INTRODUCTION
BACKGROUND

With the development of increasingly advanced technology, people can make a variety of instruments as tools in carrying out activities to regularly support the entire productivity that one of them is actualized to make an application on a smartphone. A smartphone is a small device or gadget with a screen presenting a very limited, but the presentation of the information is no less optimal like information accessed from a personal computer, depending on how they are presented [1].

Android is an operating tool for smartphones that are being intensively developed by many developers. With the Android operating tools, applications

that can be run not only audio and visual but also the interaction provided by touchscreen technology. Android is easy to use because it has a user interface that is comfortable and simple that can be easily used by a wide range of ages and groups including children [2]

Children are usually more enthusiastic about any of the reading material or visual instruments to raise their imagination and power fantasies, such as; drawing, acting, playing and listening to stories. The appeal of the story for children can not be separated from the basic properties of the child. Curiosity towards new, strange things is confidentially secret to the child, is the basic part of the development of power analytical skill, critical and their fantasies. In the world of education, especially the education of children of primary school, technology has a variety of great benefits to be applied to the education for them. It became an alternative medium of learning for children [3].

PROBLEM IDENTIFICATION

1. Technology has a variety of great benefits to be applied to the education of children, especially in primary schools. One of them became an alternative medium for learning.
2. Many applications on the *Android* platform created specifically to foster the children's learning. But not many provide learning about reading the signs of time on the clock.

Formulation Of Study

1. How to make an application for children in learning to read the clock?
2. How does the implementation of learning of this application improve children's ability in learning?
3. How to design applications for children in learning clock reading into an *Android*-based application program?

SCOPE OF RESEARCH

1. The application comes with learning material based on the game with the introduction of clocking material for first grader student of primary school is intended to add a supplementary need for children with references that relate to classroom activity according to Draft Study Meetings.
2. The application will be run by using English only or bilingual.
3. The applications can run at a minimum of the *Android* Operating System by 2.3 version of *Ginger Bread* with *Adreno* 220 GPU.
4. This *Game* is going to be built in 2-dimensional shapes, built by using *Adobe Flash CS4* tool and this game has no level difficulties as a conventional game in common.

Purpose of the Study

The purpose of this study is to make an *Android-based* application that serves as a new learning tool to recognize and further to read the sign on the clock and on a date with two languages, English only or bilingual for children, as well as enabling them to remember what they have heard and seen.

The purposes of this study are:

1.   To make learning applications in reading clock specifically for children.
2.   To implement the application of learning in reading clocks for children, so it can help children to learn.
3.   To design a clock recognition for children into an *Android*-based application program.

THEORETICAL BACKGROUND

Clock

An hour is a unit of time. Span or range of an hour is 1/24 days. One hour can be divided into smaller units of time. An hour consists of 60 minutes, 3600 seconds. According to NurFahjariyah and DefiTriratnawati, it also shows the time unit. An hour means "age or periods", while O'clock is "moment of time." when it should be used "moment or time", used the word 'at', for example: Off to go to school at 6:00. When it is used to express "age or periods", used the word 'hour,' for example: at school for eight hours.

Clock Reading

Lesson plan of teaching in the classroom relating to the material of Geometry and Time Measurement (how to read analog and digital clock) for first grader student at primary school in the first semester are as follows:

The first thing to do by the teacher is to introduce a timing device called a clock. The clock can be indicated by a digital clock or analog clock as well.

1. To introduce the digital clock, the teacher should bring digital media in the form of clock measurement and explain the parts of the digital clock that is a pointer to the left as the clock, while the figure on the right as a minute pointer. In the digital clock, the time is directly indicated by the figures that appeared. So that it can be directly read by the numbers that appear over the right part shows the hour and left part shows of the minutes.
2. To introduce an analog clock, teachers must bring the media in the form of an analog clock and explain the parts of the analog clock. In the analog clock, there are numbers starting from 1 to 12 and there are two hands that are a short needle which indicates hours and a long needle that indicates minutes. Then the teachers are using an analog clock and showing the students by rotating clockwise unanimously and ask students to read in order to know the student's ability in understanding clock reading. By utilizing an analog clock, the teacher can also ask some students to come forward in front of the class to turn the clock at certain unanimously as recommended by the teacher and then indicate to his friends to read the time together.

Timing

Lesson plan for teachers in the classroom in teaching the material of Geomotri and time measurement (How to decide the time for having breakfast, lunch, and dinner) for the first grade of primary school in the first semester are as follows:

1. In explaining to determine morning time, afternoon, and evening, the first step is to explain how we can determine the time it was said to be morning, noon, and night that can be viewed with a measure of time and also with pictures.

2. Before explaining the timing device, teachers can provoke students to get to know the morning time, noon, and night by asking the students associated with everyday activities, such as "when you are going to school, is that morning, afternoon or evening?" , "What time when you are going back home?"

3. Regarding the explanation of the morning time, noon and night, it can be described using the image as a common explanatory time for students in order to be easier to understand. The images used should be a daily activity that students do.

Writing at 1 a.m. to 12 noon is fixed as shown by the clock, by more than 12 o'clock at night and less than 12 at noon is the time in the morning could be seen by the rise of the sun and situations or circumstances in the picture happened in the morning, as that birds chirping in the mornings and for example also when they go to school at 6:00 in the morning. The clock struck at one because it goes beyond 12 p.m. then it turns to be $12 + 01 = 13$ hours and 13 is at 1 p.m. in other words. So, if more than 12 noon it is the time of day that can be seen also when the sun is high in the sky and also the weather getting hot. When the clock shows at 7 p.m. within it goes beyond 12 p.m. so it becomes $12 + 07 = 19$, so at 19 means 7 p.m. and different from 7 a.m. because the time was exceeded at 12 noon and also can be seen with the state of the dark and the sun was sunset but it appears the moon and stars. Activity on the image to show a night could be as a sleeping preparation for rest or study at night.

The time is divided into four parts, they are morning, afternoon, evening, and night with the following explanation. [7]:

1.   *Morning* means, 1) the early part of the day; 2) time after sunrise until about noon. This means significant time in the morning before sunrise or when the start of the day. Or in other words, the morning is the final part of the evening and the early part of the afternoon.

2.   Day/noon means, 1) the bright part of the day, from sunrise to sunset; 2) the time between dawn and dusk, which are approximately at 11:00 to 14:00; 3) already off the morning or nearly noon; already almost noon or evening.

3.   Afternoon means dusk. Dusk is the time afternoon, roughly from 15:00 until sunset.

4.   The night means the time after sunset until sunrise.

SYSTEM ANALYSIS

System of the Design.
*The asset of the figures***:**

a.   Pictures of an analog clock with full figures
b.   Background Applications
c.   Figures that will be the "teacher" in the application
d.   Pictures of time during the day (blue sky, white clouds, no sun). The atmosphere in the bedroom there is a large window with a daytime background.
e.   A figure of the night time (the dark sky, the stars, no moon). The atmosphere in the bedroom there is a large window with a background in the evening.
f.   Box for digital clock
g.   Supplementary notes
h.   Logo of Applications
i.   Dialog box
j.   The figure for ice cream
k.   The figure of the ice cream box

Sound and voice asset

a.   Sound "Hello"
b.   Voice "Welcome"
c.   Voice *"Let's Know the Clock"*
d.   Voice Scenario of Learning
e.   Voice Scenario of Games
f.   Voice Scenario of Discussion
g.   Voice "Right!"
h.   Sound "Well...Wrong."
i.   Voice "Hurrah! You get ice cream."
j.   Sound "Well ... You do not get ice cream."
k.   Background
l.   Voice support
m. Document Learning

Design of Animation

This kind of form by simple animations with text and sound also back sound.

a.   Meaning of clock (associated with the introduction of the material first grade of elementary school)
b.   Type of clock (analog and digital)
c.   Usage of the clock (associated with the introduction of the material first grade of elementary school)
d.   Clock parts (length needle, short needle, the needle of seconds)
e.   Discussion in the reading clock.

Design of Games

1.   Guessing the clock
Clue: the question "What time is it now?"

The question is in the form of an analog clock that was set for its hands or needles (note: the long needle is always at 12 o'clock sharp) and also uses the background of day or night.

Answer: Box will be prepared below the question to answer it. Boxes can be clicked and typed numbers. There will be two main boxes; the first box for answers towards hours and minutes, while the second box is about day or night (referring to the background shown in the problem).

Purpose: Students can read an analog clock and then translate them into a digital clock. They can also find out the difference between day and night through images and questions that are displayed.
screenshot

Scoring: If the answer is correct, they will be presented by the sound of "Yes!" Then the students will get one point of each correct answer.
If the answer is wrong, they would be presented sound "Well ... Wrong". For each wrong answer, it will not reduce the points that have been obtained previously.

Final scoring: after they answered 5 questions, the program will accumulate points from that question. Then the students will get ice cream according to the number of points that he/she can be in the total score.

Set The Clock Hands

Clue: The question "Can you arrange a time for me?"

The problem in the form of both statements and questions "Now is at 02.00 p.m. (using a digital clock). Can you arrange a time for me?

Answer: Analog clock will be provided and background choices are day or night to answer questions. Analog hour-long needle (hand) and the shorthand can be played in the circular.

Scoring: If the answer is correct, it will be presented by the sound of "Yes! " Then the student will get one point of each question correct. If the answer is wrong, it would be presented by sound "Well ... Wrong!" For each wrong answer will not reduce the points that have been obtained previously.
SCREENSHOT

Final scoring: after they answered 5 questions, the program will accumulate points from that question. Then the students will get ice cream according to the number of points that he/she can be in the total score.

System Implementation

In the application of *learning to know the clock,* there are few studies that aimed as a conduit of information about what is the *hour*, the kinds of *hours*, usability *clock*, clock parts, day and night, as well as the subject of how to read a clock. This application was created as alternative learning for children in the first grade of primary school. Therefore, the learning form displayed in the form of audio-visual animation that is adapted to the material being studied first grade of primary school. Some of the things that must be considered by looking at the material studied by the first grade of primary school are as follows [9], [10]:

1. The user interface shown in this application should be interesting.
2. Each part of learning is in the form of animation with audio back sound which is typical purposed for the children and reading text on the screen as a compliment.
3. Discussion on how to read the clock is just reading hours per 60 minutes. Example: 1 o'clock, 4 o'clock. The screen will show an analog clock with the complete numbers from 1 to 12. Then the hand of an hour and minute will spin and stop in the number 12 (sharp) and the hand of the minute is on one of the numbers between 1-12 on the clock display. Example: Shorthand is in numbers 1 and longhand is in the 12, then the audio will present a sound of *boom* and the words "One o'clock". After that, it will rotate back. Then the shorthand is on the 11 and longhand is in number 12 and the audio will sound words "Eleven o'clock"

GAMES SCENARIO

In the application of *learning to know the clock,* there is an educational game that aims to train memory of children in common dealing with applying lessons of previously taught in the "Learning". This educational game has two game types, namely *"Guess Watches"* and *"Set Clockwise"*. Basically, these two types of games that have the same method are asking questions about "How many hours" but by different methods, and also with different problems provided. Every one case or problem that appears only has one answer that should be answered by the users (children/students). The scoring system is using a plus point. The plus points are the way of assessment to the correct answer without reducing the answer that has been answered incorrectly. Accumulated of plus points shown when the users are finished answering the questions 5-10. Rate of plus points will produce a rating for the provision of "Ice Cream". The more points earned, the more the "Ice Cream" is obtained. Why "Ice Cream?", because usually, the kids are very fond of "Ice Cream" so it is expected that the reward of "Ice Cream" as the value of the rating can provide more interest in encaustic for them in order to answer the questions correctly. This game has no levels, but if users often play this game and answered the question correctly, then the user will have more "Ice Cream".

"Learn to know the clock" – Guessing Clock Games
The game *Guessing Time* is one of the types of games that run in the application *learn to know the clock.*

Figure 1: Guess the Time

Description in Figure 1: The design of the menu in opening games. This view pops out with a back sound that is typically children's songs and the words "*Guess the Time*" in a loud voice. Then, after a stand by back sound, it will continue until the user touches the clock and go to the next display.

Figure 2: What time is it now

Description in Figure 2: The design of the question menu displays in the games. This view will pop up with the back sound of children's songs and the words "What time is it now?" in a very loud voice, followed by the words "Guess the time in the digital box!" Then the user fills in the answers in the box provided. A time/clock box is a box that is provided for the user to be filled in the answers he thinks that the clock is correct. The minute box is a box that is provided for the user to fill in the correct answer according to which the minutes available.

The box Time Information is a box that is provided for the user to be filled in the answers to the time of day or night presented by the display.

CONCLUSION

Learning applications learn to know the clock for *Android-based* can help first grader children in understanding and recognizing how to read a clock.

Implementation of learning application of learning to know the clock includes the introduction of a digital clock and analog clock.

Designing learning applications *learn to know the clock* is adjusted to the children's favorite games like the game to get a reward of ice cream in learning to know the clock.

SUGGESTION

Use more animations to attract children to use this application. Games should be more created so that children do not get bored quickly.

REFERENCES

Shahram, Latifi., "Information Technology: New Generations 13 Th International Conference on Information Technology (Advances in Intelligent System and Computing Book 448), Springer, 2016.

Bernstein, James., "Android Smartphone Made Easy: The Beginners Guide Mades for Beginners, Kindle Edition, 2019.

Sweeney, Joan., "Me Counting Time: From Seconds to Centuries", Kindle Edition, 2019.

DK., "How to Tell Time: a Lift-to-Flap Guide to Telling Time", DK Children, 2019.

Sobha., "Advanced Time Telling – Introducing Minutes – Practice Worksheets Workbook WithAnswers: Daily Practice Guide, CreateSpace Independent Publishing Platform; Workbook edition, 2017.

Halas. John., Whitaker. Harold., et all. "Timing for Animation", Kindle Edition, 2020.

Collin., "Times Tables Workbook Ages 7-11: New Edition", HarperCollins UK; Revised edition, 2015.

Maxim, Bruce R., Pressman, Roger S., "Software Engineering: aPractioner's Approach", McGraw-Hill Education, 2015.

Booch, Grady., Rumbaugh, James., and Jacobson, Ivar., "The Unified Model Language User Guide," Addison Wesley-Profesional, 2005.

Fowler, Martin., "UML Distilled: a Brief Guide to The Standard Object Modelling Languages", Addison Wesley-Profesional, Third Edition, 2018.

Kulak., Daryl., "Use Cases: Requirements in Context", Addison Wesley-Profesional, Second Edition, 2012.