

ANDROID-BASED LEARNING MEDIA IN CONTEXTUAL TEACHING AND LEARNING ON JAPANESE LANGUAGE READING

FRIDA PHILİYANTI^{1,*}, NURIA HARISTIANI², YUMNA RASYID¹, EMZIR¹

¹Applied Linguistics Department, Post Graduate Program, Universitas Negeri Jakarta

²Japanese Language Education Department, Universitas Pendidikan Indonesia

*Corresponding Author: fridaphiliyanti@unj.ac.id

Abstract

This study aims to develop Android-based media and demonstrate its impact on the students' comprehension and ability for reading Japanese at the beginner level. Media development is conducted by considering the components of Contextual Teaching and Learning (CTL). The application consisted of training, 6 pieces of reading texts and question sections. The study was conducted using a pre-experimental method, with one-group pretest-posttest design. The sample of the study were 14 novice readers, and the material or text used in this study was the text used in the N5 Japanese Language Proficiency Test (JLPT) exercise book. From the test results, there is 26.2% of improvement in learning achievement after the students used the application. The advantage of the application lies in the time calculation feature so that both students and teachers can monitor the progress of reading speed and also their ability to answer questions. Students can work independently or collaborate with friends. From the teacher's point of view, this application helps them to monitor each process and progress of students' reading, since this application is equipped with a Sharing Tools. As a medium that facilitates CTL, this application is proven to be highly supportive because of its valuable components of Purpose, Building, Application, Problem Solving, Teamwork, Discovery, and Connection.

Keywords: Android-based learning media, CTL, Japanese language reading.

1. Introduction

Reading is a process of translating signs and symbols into meaning and incorporating the new meanings into existing cognitive and affective systems [1]. Reading in Japanese provides a special challenge because of the unique characteristics of Japanese compared to other languages [2]. Unlike Chinese, in Japanese, there are at least three types of letters, namely *hiragana*, *katakana*, and *kanji* where all three types of letters have their respective functions. Especially for novice readers, remembering letters and understanding the use of all letters are certainly not a simple thing. In addition to the same as Chinese, writing in Japanese is presented in a form without spaces. Reading in Japanese can only be understood if we know the meaning of the word. This is because writing in Japanese does not recognize spaces. Another interesting factor is the level of difficulty in reading text written in *hiragana* and *katakana* is higher than if the text is written in *kanji* [3]. Dylman and Kikutani [4] explained that this would be because *kanji* words are read via a semantic-lexical route, while *hiragana* and *katakana* words are read via the non-lexical phonological assembly route. Contextual Teaching and Learning (CTL) is one of the learning strategies that are considered suitable to overcome the difficulties related to reading. It is a strategy prioritizing the meaning of the contents of learning because only with meaningful learning, knowledge will be easily absorbed and leave a long-term memory. Learning is not only relating to understanding, but also other factors. This is because understanding without knowing its benefits will not last long in our memory. CTL is a system in the learning process that links knowledge acquisition in the classroom to its context in life, so students can feel a meaningful learning. Johnson [5] reported that the main point gained from learning using CTL is to make students to remember, understand, and interpret the learned materials.

There have been a number of studies on the use of Computer-Assisted Language Learning (CALL) and Mobile-Assisted Language Learning (MALL). A study investigating the effectiveness of Push Notification in mobile apps for English as a Foreign Language (EFL) learners found that the mobile app with Push Notification enhanced students' motivation and skills of English [6]. In line with this, a study on the use of tablets as an additional learning medium has proven that it helps increase students' interests in learning English in Hawaii because they show favorable attitudes towards the use of MALL [7]. The attitude is supported by 45 EFL students coming from different background who stated that MALL has high potentials of building constructivism in EFL learning [8]. In the context of learning Japanese, either CALL or MALL have been proven to be able to improve students' language skills as well as interests and motivation in learning Japanese ranging from elementary schools to college level [9-11].

In this research, the Android-based medium was hypothesized to be a fresh and interesting learning medium for students, especially for novice readers ranging from 17 to 19 years old. Mobile phones with the Android operation system are the most common types of gadgets owned by Indonesians, because this type has more advantages than gadgets with iOS [12-14]. Based on existing research studies by Haristiani and Firmansyah [12] and Haristiani and Aryadi [13], existing research studies, especially those, which focused on using Android-based media on language learning such as vocabulary and learning *kanji*, showed satisfactory results. Although the application, which helps students in learning *kanji*, had been developed, and also there are indeed Android-based Japanese reading learning

applications such as “TangoRisto” and “Michiko”, which focus on vocabulary, kanji, or grammar, but in formal education in particular, we need an application that can also facilitate teachers to monitor the development of their students. It is also necessary to have texts and questions related to it in order to measure students' reading ability. In addition, most research studies on MALL have focused on learning English as second language or foreign language, yet there are few studies in learning Japanese. In correlation with CTL approach in learning reading, the developed application provides a reading timer and results' sharing features, which can make teachers or a teaching team easily monitor the progress of each student's reading ability.

2. Literature Review

2.1. CTL

The fundamental principle of learning through CTL is the link between information obtained in class and daily life outside the classroom. CTL is a learning strategy that prioritizes the meaningfulness of knowledge for students. Teachers act as a motivator and facilitator in this model. They give the widest opportunity for students to explore and find out knowledge, cooperate with other students in solving problems, until they find out the new knowledge. The CTL system encompasses the following eight components, which are [5] (1) making meaningful connections; (2) doing significant work; (3) self-regulated learning, (4) collaborating; (5) critical and creative thinking; (6) nurturing the individual; (7) reaching high standards; (8) using authentic assessment.

There are seven principles in the context education approach, including Purpose, Building, Application, Problem Solving, Teamwork, Discovery and Connection [15, 16]. "Purpose" means that students must know for what they are learning so that they can interpret the learning. "Building" is a stage where students construct ideas or experiences in the past using information they have just acquired in learning. "Application" is identical to experiencing a lesson directly but this time they already know how. "Problem solving" is closely related to other learning processes such as application, cooperation (teamwork), and connection to finally find meaning (discovery) and solutions to problems encountered during the learning process.

2.2. Mobile assisted language learning

The grand theories underlying the development Android-based media are Information and Communication Technology (ICT), Computer Assisted Language Learning (CALL), Mobile Assisted Language Learning (MALL), and Web Assisted Language Learning (WALL). All of these is part of the efforts of educators to assist students in obtaining, processing, and absorbing information, especially in language education field. The use of technology as an attempt to improve learning outcomes generally known as Technology-enhanced Learning (TeL), where students are expected to experience other sensations of a learning process that they cannot feel in the formal education space [16]. Then, Indonesia is predicted to become the fourth country in the world in the number of mobile users after China, India and the United States [17]. Figure 1 shows the data on active smartphone users in Indonesia.

From Fig. 1, the number of smartphone users in Indonesia keeps increasing year by year. This indicates that the chance of using smartphones in the education sector will give a greater impact. Some of the main reasons of the preference to use mobile phones are due to their small shape, convenience, and function a mini computer that can be used anywhere and anytime [18]. Furthermore, mobile phones as a mobile learning device are characterized by their potentials for learning to be spontaneous, informal, personalized, and ubiquitous [19].

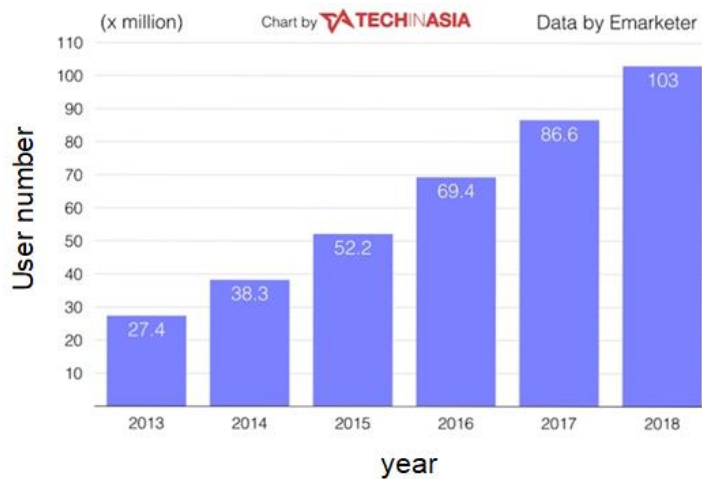


Fig. 1. Data of Indonesian active users of smartphones [20].

3. Research Methodology

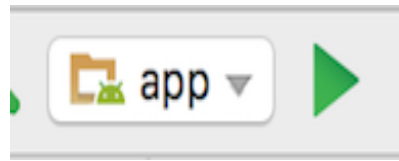
3.1. Experiment methodology

The research methodology used in this study is a pre-experimental method, with one-group pretest-posttest design. The participants of this study were 14 novice readers, and the material used in this study are the texts that appeared in the N5 Japanese Language Proficiency Test (JLPT) exercise book. JLPT is an international standard test for Japanese proficiency, while N5 is the lowest level for beginners.

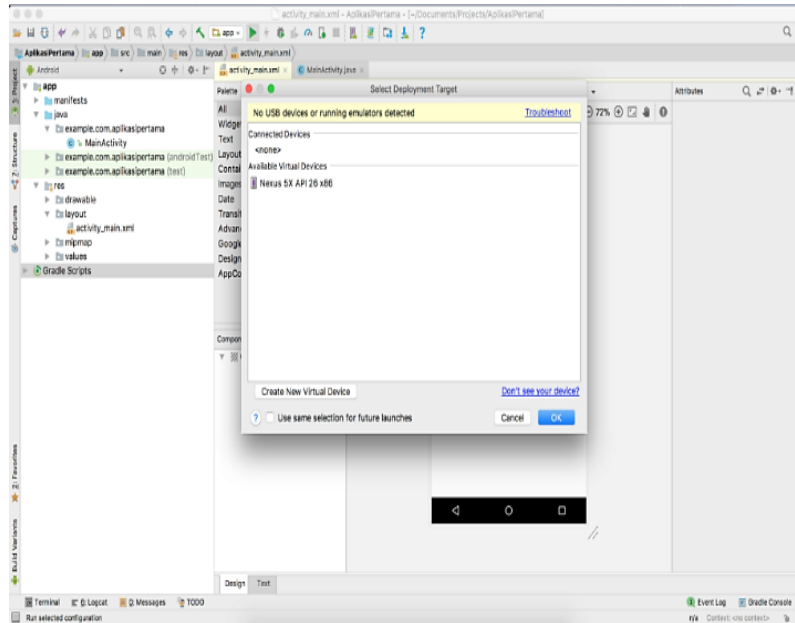
3.2. Application running test

Application Running Test is required to review the functions created on the application when it is running. To check the functions made on the Android Studio programming page work or not. First, users need to press the Play Button, Fig. 2(a), and the command will appear to ask them to connect program with the Android device, which will be used to test the application. To connect the Android device, they need to follow these setting steps; 1) select the Developer Option Menu in the Settings Menu, 2) activate the USB Debugging option, then 3) plug in the smartphone into the computer using a USB Cable. If a warning appears on Android device regarding USB Debugging permissions, click "Allow" and install the Android smartphone driver on the computer. After that, they need to return to Android Studio program, and then Android device will appear in the dialog box in the Connected Devices section as shown in Fig. 2(b). They should then select the

Android device to be used and select OK, then wait for the compiling process to finish. Lastly, the Android application will run on the Android device set.



(a)



(b)

Fig. 2. Displays of application running test. (a) is the “Play” button, and (b) is the display of application running test page.

4. Results and Discussion

4.1. Application contents

The appearance of Android-based application was developed and shown in Fig. 3. The application contains the following displays:

4.1.3. Welcoming display

This part contains name of the user; operating instructions; the general information about the application such as the creator’s name, coder’s name, and icon designer’s name; and session choices that are divided into three sessions. This “Welcoming display” appears differently between the new user (see Fig. 3a) and users who have been logged in before, Fig. 3(b).

As shown in Fig. 3(a), when users open the application for the first time, they are required to write their name. Once they finished the session, they can continue the practice in another time, and by the time they re-open the application, the display will turn as shown in Fig. 3(b). The “Change Name” button allows students to run this application even from the same smartphone because the data that sent to the teacher will be for every user, not for every device. On the "Instructions", Fig. 3(c) section, users are suggested to read the rules of the whole sessions carefully. In the upper right corner, there is "i" button, which means "Information" consisting a brief description of the application, Fig. 3(d).

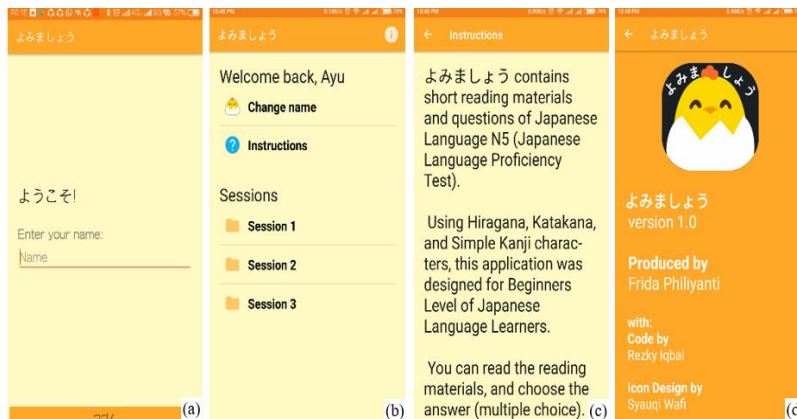


Fig. 3. Appearance of welcoming displays. (a) Initial welcoming display, (b) Welcome back display for recent user, (c) Display for instruction, and (d) Information display.

4.1.2. Training session

As shown in Fig. 4, each section consists of vocabulary exercise (*renshuu/練習*), text (*tekisuto/テキスト*), and questions about reading material (*mondai/問題*). Each time users complete one section, they are not permitted to return or their data will be reset.

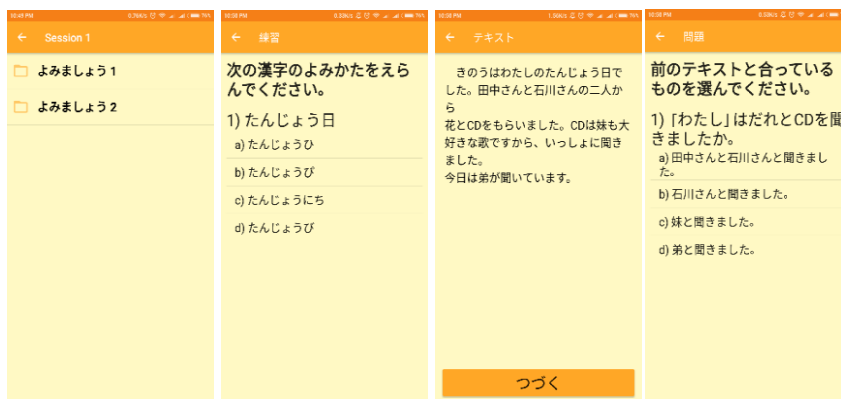


Fig. 4. The contents of each session.

4.1.3. Training result display

After users have completed the section, the Result screen will appear as shown in Fig. 5(a), which contains their score and time duration. The score includes the total score and the score of each section, and the time duration includes the total time and per section time spent by the users. On this display, they can also check the answer key.

4.1.4. Sharing tools display

At the result screen, there will be “Share Results” button in which, the users can share it with the teacher or other people as shown in Fig. 5(b). It gives all precise data needed by the teacher to monitor each progress of the student’s learning process. In this study, before students close the application they must share the results with the teacher by using the “Share Results” feature. As shown in Fig. 5, several Android sharing applications will appear on the screen, and the students can choose the most suitable application for them.

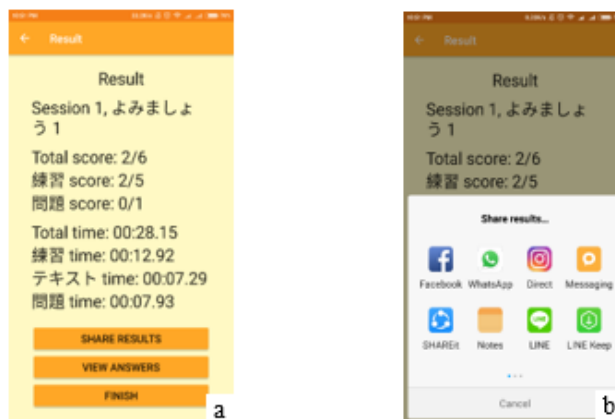


Fig. 5. Displays after completing the section. (a) is the display for result, which contains score and time duration, and (b) is the display for sharing results, which shows various android sharing tools.

4.2. Experiment on “Yomimashou” application

To examine the effectiveness of this application as learning media, students are given pre-test questions, which contains JLPT N5 test material to find out their initial abilities. After pre-test, students are given learning materials, which are reading materials included in “Yomimashou” (reading) application sessions 1 to 3. Further, a post-test was conducted to find out the impact of using “Yomimashou” application to students’ learning results. The results of pre-test and post-test are shown on Table 1. From Table 1, it can be seen that there is an improvement on students’ pre-test and post-test results, indicated by their average score. Their average score is 58.30, while post-test’s average score is 84.50, with an increase of 26.20%. 13 students experienced a satisfying improvement in their results of the study. The score difference from pre-test and post-test results showed students’ achievement before and after they used “Yomimashou” application. This implied that the use of “Yomimashou” application can help students to improve their

reading ability. According to Millward [20], this result is in line with that of a study implementing a mobile device to improve English reading ability. Moreover, it has been proven that mobile phones can increase students' reading and grammar ability as well [21]. In order to make this difference easily visible, the increase in experimental results is described in Fig. 6.

Figure 6 reveals the impact of the "Yomimashou" application on each student's test results. Out of 14 students, 12 of them showed rather significant improvement on their post-test score.

In addition to the results, "Yomimashou" also has a feature to detect students' reading speed as shown in Table 2. The reading speed is calculated from overall duration divided by the number of words in the reading.

Table 1. Pre-test and post-test score comparison.

No.	Samples	Pre-test	Post-test
1	Student 1	66.7	83.3
2	Student 2	33.3	100.0
3	Student 3	66.7	83.3
4	Student 4	66.7	83.3
5	Student 5	83.3	100.0
6	Student 6	50.0	100.0
7	Student 7	66.7	66.7
8	Student 8	33.3	83.3
9	Student 9	50.0	100.0
10	Student 10	83.3	100.0
11	Student 11	66.7	33.3
12	Student 12	66.7	100.0
13	Student 13	33.3	83.3
14	Student 14	50.0	66.7
Average		58.3	84.5

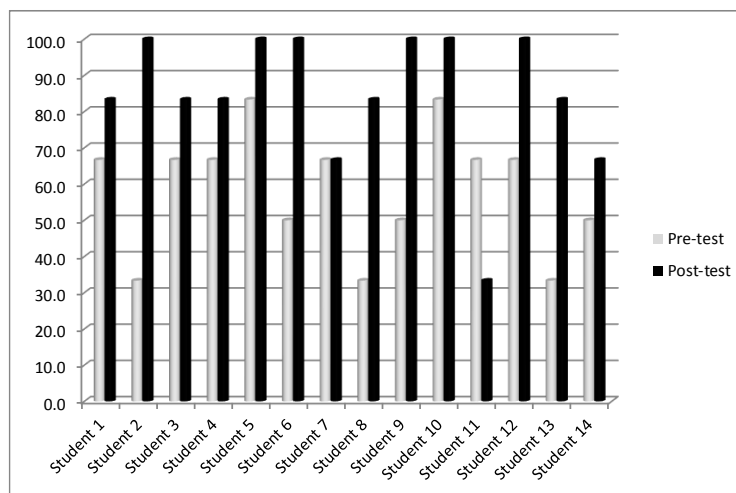


Fig. 6. Differences in pre-test and post-test.

Table 2. Results of JLPT text reading speed N5 (words/second).

Samples	Text 1 [20 words]	Text 2 [35 words]	Text 3 [70 words]	Text 4 [43 words]	Text [54 words]	Text 6 [65 words]
Student 1	2.05	1.20	1.67	0.67	0.36	0.02
Student 2	3.11	1.75	2.23	0.33	0.50	1.09
Student 3	3.39	1.62	1.86	1.32	2.04	1.71
Student 4	1.62	1.93	1.58	1.69	1.89	1.43
Student 5	1.52	2.61	1.07	2.96	3.00	1.82
Student 6	2.56	2.08	1.08	1.75	2.34	1.65
Student 7	0.63	2.17	1.39	0.44	3.19	1.02
Student 8	0.39	1.50	1.92	1.37	3.30	1.17
Student 9	4.30	1.05	1.54	2.23	2.57	1.82
Student 10	0.49	2.35	0.02	0.32	0.52	1.14
Student 11	0.09	0.29	0.60	1.29	0.51	0.53
Student 12	1.62	2.25	1.78	1.52	1.44	0.87
Student 13	2.47	2.19	1.32	1.50	2.36	1.33
Student 14	0.15	2.48	1.62	2.21	2.16	1.05
Average speed (words/second)	1.74	1.82	1.41	1.40	1.87	1.19

Because each session consists of three readings, the total number of texts in this application is six. Table 2 shows that the reading speed of students varies depending on the type and length of reading. Figure 7 shows that 5 out of 14 persons used the longest duration at the beginning of the training, and 4 out of 14 persons read with the longest duration in the second text. This shows that in the beginning, students are still adapting to the application. In each session, the text provided is actually getting longer (except Text 3 with 70 words, however, mostly written in Hiragana and numbers rather than Kanji) and the questions are getting more complicated, but from Fig. 7, it is seen that within each session the students are able to read faster and smoother.

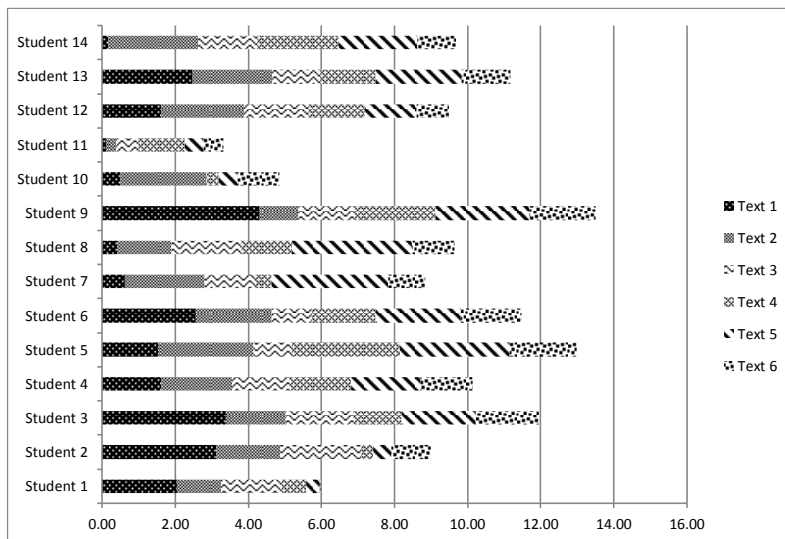


Fig. 7. Student's reading speed in "Yomimashou".

4.3. CTL and android

As mentioned in the beginning of this paper that CTL is a strategy that prioritizes the meaning of the contents of learning rather than memorizing them. The application developed is considering the CTL principles. The steps of each session help students to ease them comprehend the readings. Based on above analysis about the learning characteristics found in CTL and the availability of android-based media owned by the students, we can conclude that “*Yomimashou*” supports reading learning in CTL.

In the beginning of learning students are given an explanation about the purpose of their work on the questions presented in the "Instructions" part, in CTL this process is called “Focus”. The "Building" process conducted when students work on vocabulary practice questions. At this stage, the students recall the words they have learned before or learn new words they do not know yet, however, in this way, their brains are being prepared for the next process. At the reading stage, students begin to apply their ability to recognize letters, *kanji*, and words. Thus, they can comprehend the whole or most of the reading, which suit to the stage the "Application" process. Then, at the stage of answering questions about reading, finding out the correct answer while they did wrong and discussing with friend to avoid next mistake is time for students learn to do "Problem Solving" process.

Although learning with this application is intended for independent learning, however, as an implementation in CTL and to test the advantages of this application, which are the timer and sharing feature, at the beginning of the experiment students, are divided into several teams. One team consists of two people. In this experiment, it was agreed to create a WhatsApp Group, and at the end of each session, all students must share the results to this group. Since all members of the group can see the results of each student, there is an indirect competition among them. In this process, they realized the importance of collaboration. From the previous research, Wang and Smith [22] conclude that mobile device provide a handy portable means of electronic information sharing in the process of collaborative learning. When this happens, the "Teamwork" process occurs. Also, students find information or new knowledge, whether regarding vocabulary, *kanji*, or strategies while answering questions in “*Yomimashou*”.

Furthermore, speaking in teams is a part of the "Connection" process. Overall, the materials in “*Yomimashou*” considered useful as JLPT practice materials for those who are taking the JLPT test. Since the instruction of “*Yomimashou*” clearly explains what kind of reading material must be contained, the students have had good understanding on how useful these exercises are, especially reading exercises that they do not find in formal classes. In the context of education, learning applications need to be in relevant contexts to support comprehensive and effective learning [6].

5. Conclusions

Android-based learning media are one solution that is effective in improving language ability. “*Yomimashou*”, a user-friendly application developed in this study proved to be able to improve learning results in reading Japanese for basic level students or novice readers. Difficulties previously felt by students in reading Japanese texts can be minimized through the use of “*Yomimashou*”. In this application, the texts are not too long and its screen keep the students’ interest to

go on. Besides, the use of smartphones also offers another benefit because all students are so familiar with it. Not only does this application give advantages to the students, it is also effective based on the teachers' point of view since it makes it easy for them to monitor their students' learning processes. In terms of CTL, the components of "Yomimashou" namely Purpose, Building, Application, Problem Solving, Teamwork, Discovery, and Connection really support effective implementation of the teaching and learning process.

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