DEVELOPING A SMARTPHONE APPLICATION PROTOTYPE AS DIGITAL SUPPLEMENTARY READING MATERIALS FOR THE TENTH GRADERS OF AGRICULTURE STUDY PROGRAM OF VOCATIONAL HIGH SCHOOL

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ABSTRACT

The use of technology in language learning has improved the development of educational products. Related to reading, it makes reading materials not limited to printed-text only. The Mobile-assisted Language Learning (MALL) makes smartphones have a big impact on education since they can be used as a device to access variety of technology-based learning materials. In such a way, the development of learning materials that can be accessed from a smartphone is highly needed these days. Thus, the need for accessible learning material from mobile phone is crucial to students, especially during the current situation where online learning is carried out. Since students should do distance learning with teachers, mobile applications can be an additional material which can accommodate students to learn independently. The current study is conducted to develop a prototype of a smartphone application to support the integration of technology to the practice of English Language Teaching in Indonesia. The R&D model of Borg and Gall (2003) was used for the development of this digital supplementary reading materials prototype. The final version of the product consists of a manual book in the form of .pdf and a smartphone application named 'SEEDs.

Keywords: Mobile-assisted Language Learning (MALL), supplementary reading materials, Research & Development

BACKGROUND
The Minister for Education and Culture of Indonesia stated four education priorities that he will work for. One of them is technology development for education. With the advancement of technology that makes better-computerized programs (software), students should be able to learn through many modes (Robinson, 1975). Since the focus skill of this study is reading, Long (2016) defines reading mode as any method or device that allows for reading comprehension takes place. Electronic devices like laptops, tablets, or smartphones can help students to access e-books, English learning applications, or English learning websites.

Although there is a debate on smartphone use for educational practice, smartphones can still be beneficial when teachers can guide students to use it wisely. The negative impact of smartphones for students makes some schools in Indonesia ban their students from bringing smartphones to school. However, smartphones still have a positive effect since a previous study conducted by Weng & Chen (2015) shows that students give positive feedback to the use of smartphone applications to learn English. The benefit of smartphones for education is to access language learning applications, online learning websites, or language learning channels. Bona (2014) shows that mobile learning can help students develop their English skills which are represented by students' scores. Noriega (2016) stated that mobile learning and genre approach could be integrated to increase students' writing ability. Meanwhile, Setyowati (2014) presents in her paper that mobile comics, which is part of mobile learning, can be useful to introduce literature to very young learners. Therefore, mobile learning can offer an option to be implemented in the process of language learning.

Many researchers have talked about Mobile-assisted Language Learning (MALL) or mobile learning (m-learning). Bona (2014) defines a smartphone as a mobile telephone with a computer functionally that allows users to run software applications and connect to the internet or other data networks. Meanwhile, Kukulska-Hulme & Shield (2008) stated that 'mobile learning' refers to formal and informal learning mediated via handled devices and potentially available anytime and anywhere. In the practice of mobile-learning, teachers as students' facilitators should guide the students to wisely use their smartphones. For example, guiding the students to install any mobile application or access any mobile learning websites as English learning additional materials where students can try various learning activities.

This study focuses on developing a mobile application as a contribution to the implementation of mobile learning to English language teaching in Indonesia. Based on a literature review study conducted by Klimova (2018) about the use of smartphone applications for TEFL, it is found that the use of smartphone and its apps generate positive effects on the development of four language skills. The point is it depends on teachers' open minds, creativity, and preparation
to integrate the smartphone in the curriculum; school budgets and culture to allow students to use smartphones; and continued innovation in how devices are used, so they remain effective (McQuiggan, et.al., 2015). Therefore, mobile learning products and the implementation of mobile learning generate positive effects for students.

Motivating students on learning can be difficult. Based on the informal preliminary study with a teacher from SMKN 1 Grujugan, it is hard to motivate students to read their textbooks. As a solution to this issue, Tayan (2017) stated that smartphones used could increase motivation to engage students with interactive learning practices. Therefore, with the result of the previous study which shows the use of mobile learning that can increase motivation, mobile learning products in the form of learning applications which have a variety of interactive activities can be an option that should be given a try. Moreover, Setyowati (2014) stated that smart gadgets like smartphones and tablets could create exciting and meaningful activities for students. With mobile learning, reading activities can be supported by animated pictures, videos, interactive exercises, or pop-up glossary. Mobile learning can facilitate the development of reading text which is not limited to printed text only. Therefore, the development of mobile learning products can be really beneficial both for teachers and students.

Vocational high school has many study programs that lead to the need for various instructional materials. Those different study programs make students have different needs and interests that would influence their motivation to learn and affect their learning (Hutchinson & Waters, 1987). Related to the motivation issue found in the preliminary study, when the materials provided are suitable for students' study programs, it could motivate them to learn English. The teacher also believes that it could make the students interested and feel motivated with the lesson by giving suitable materials for students. Thus, on choosing the text for the supplementary reading materials, one of the three descriptive texts chosen is related to the targeted students' study program.

On developing the materials, MALL is chosen as an area of technology development for education that the researcher works for. It is because the researcher wants to make the use of smartphones more beneficial for students by developing a smartphone application that can be accessed either in a formal or informal learning context. Beyond a textbook, there are many options for additional materials and the latter may be crucial in the overall success of a course (Brown & Lee, 2015). Those additional materials are called supplementary materials. Related to reading, a study conducted by Salih, et.al. (2018) found that supplementary reading materials are an effective medium for learning reading. Furthermore, it is explained that supplementary reading materials could develop students' comprehension skills.
Since reading is the focus skill of this study, the development of a smartphone application prototype should implement the Three-phase reading technique which consists of three reading stages: pre-reading, whilst-reading, and post-reading. There will be activities on each of the stages to help students comprehend the text. Before getting started to the pre-reading stage, there is a warm-up activity where the students are shown with a picture and asked to describe what they see from the picture. Meanwhile in the pre-reading stage, readers can activate the relevant schema (Alyousef, 2006). The schema itself is a theory that allows the readers to predict what may happen from the text by relating the 'text' to the readers' background knowledge (McDonough, 2003). On the application itself, the students are given a picture that is related to the description text. Students are given a drag-and-drop activity and asked to put the words which correctly describe the picture. Furthermore, previewing the text on the pre-reading stage can also help students to explore the text features such as text title, pictures and captions, text heading, and other features (Sulistyo, 2011). The application also exposes the students with three different titles of descriptive text and their text features.

The second is whilst-reading or also called as a during-reading stage. This stage asks for students' understanding of the text. Cross-checking any unknown words or phrases from the dictionary and/or another similar phrase in construction could help students to reach their understanding (Sulistyo, 2011). Besides independent cross-checking of the unknown words, the application is provided with a pop-up glossary. When students click on the underlined words from the text, the meaning of each word appears immediately. Meanwhile, Tarshaei (2015) stated that on the whilst-reading stage, students should be given the opportunity to confirm their predictions, gather and organize information, and begin making generalizations gained from the text. In short, understanding the message from the text is the goal of this stage. To help the students gain their understanding of the text, three different reading activities in the form of multiple-choice questions, drag-and-drop, true-false, short answers, and crossing wrong words are provided in the whilst-reading stage.

For the post-reading stage, Brown & Lee (2015) believed that comprehension questions are appropriate for this stage. Therefore, questions in the form of short answers are given in this stage. Besides, students are given a listening session that still talks about a descriptive text. In this session, students are asked to listen to the text and answer the questions. It is based on Wallace & Barnet (1922, 1988) who stated that it could be an effective strategy to transfer reading skill to the text and integrate reading skill to other language skills (cited in Apsari & Yana, 2015). After the students had done the three stages, there is an explanation about the social function and the generic structure of a descriptive text. There are also two exercises...
followed to check students' understanding of the function and the structure of the descriptive text.

**METHOD**

The R&D model by Borg and Gall (1983) is used for this study. The research stages start with needs analysis, product development, experts' validation, first revision, try-out, second revision, and the final product. Figure 1.1 shows the R&D model being applied to this study.

- **Needs Analysis**
  - Interview guide for teacher

- **Product Development**
  - Selecting basic competences
  - Preparing the materials (materials development) and quizzes
  - Developing a digital supplementary reading materials

- **Experts' Validation**
  - Giving a checkpoint to the experts (a lecturer and a teacher)
  - Experts give evaluation and suggestions

- **First Revision**
  - Revising the product based on the result of expert’s validation

- **Try-out**
  - Product try-out to students
  - Giving checklist to students

- **Second Revision**
  - Revising the product based on the result of students’ questionnaire

- **The Final Product**
The process of this research started with collecting information by conducting a needs analysis. The instrument used for this stage was an interview guide for the teacher. The interview guide was used to obtain about eight aspects related to students' characteristics, reading materials, instructional media, and MALL implementation. The result of the needs analysis will be used as the foundation for developing the product.

The second stage was analyzing the result of the needs analysis as the consideration on developing the product. The product development consisted of two stages which are materials development and smartphone application development. In developing the materials, this study implements the procedure of materials development by Jolly & Bolitho (2011), consisting of exploration, contextual realization, and pedagogical realization.

**Figure 2.1 The Research Stages of the Study (Adapted from Borg & Gall (1983))**

In the exploration stage, the researcher selected the focus skill, basic competence, and learning objectives. The focus skill of this study was reading and the basic competence used was Basic Competence 3.4 and 4.4 for the 10th graders about Descriptive Text.
The contextual realization stage started with deciding the topic of the text. Since the targeted students of the product were Agriculture students, the chosen topics were a combination of general and specific reading topics. Besides, since the basic competence stated that the descriptive text should cover the description of a place, a person, or a thing, the text chosen for the product were three descriptive texts with the title 'Ijen Crater' 'Meat Grinder' and 'Quokka'. The pedagogical realization stage is related to the implementation of the Three-phase reading technique to the product. The Three-phase reading technique itself consists of the pre-reading stage, whilst-reading stage, and post-reading stage. There were reading activities made to check students' understanding of the text. Before starting the descriptive text, there was a warm-up activity in the form of drag-and-drop. Meanwhile, on the pre-reading stage, the students showed a photo preview related to each descriptive text. Students were asked to choose the words that were suitable to describe the picture. This activity was in the form of a drag-and-drop. This activity was created to activate the students' background knowledge before reading the text. On the whilst-reading stage, the students started to read the descriptive text. There is a 'book' icon shown which has a function to reread the text. Besides, there was a pop-up glossary from some selected words from the text to help the students understand the text. After that, there were reading activities in the form of true-or-false, drag-and-drop, multiple-choice, and crossing the wrong words. Each type of activity consisted of five questions. The last was the post-reading stage in which the students were given a short listening session. The text used in the listening session was a descriptive text and the activity used was in the form of a short answer. Students should listen to the audio then answer the questions based on what they had heard.

After the post-reading stage finished, there was an explanation about the function and generic structure of a descriptive text. There were also two activities to check students' understanding about the function and generic structure of a descriptive text. The activity about the function of the text was in the form of multiple choice. Meanwhile, the activity about the generic structure of the text was in the form of short answers and drag-and-drop. Every activity was provided with an answer key. Besides, the score of each activity appeared immediately after the students had done the activity. To help the teacher check the students' scores while using the application, the application was added with a 'Mail Result' and 'Share to WhatsApp' option in which students could share their scores. After the researcher had prepared the materials and the smartphone application concepts, she worked with a creative multimedia studio to help her develop the product.

On developing the product, the need analysis results would be the basis of making the product. Since this study needed collaborative work, the researcher worked with Makaryo Studio that
has experience in developing instructional products. The studio was chosen since its portfolios showed good quality products in terms of design and animation. The researcher's role was preparing for the materials and explaining the features used for the application. The role of the creative studio was to put the researcher's concept into the product. The next stage was asking for experts' validation. This study involved a lecturer and a teacher in validating the product. A validation sheet in the form of a checklist was used to know the product's quality. The result of the experts' validation was used as a foundation to do the first revision of the product. The next stage is still in the progress of being implemented. After doing the first revision, the next stage is trying-out the product. The product is going to be tried-out to the 10th graders of SMKN 1 Grujugan. The school is chosen since it has an Agriculture study program. Since the school is still in online learning, the try-out will be conducted online. The students are going to be given three links. The first is a link to download the application, the second is a link to access the google form as an online try-out questionnaire, and the third is the link for the manual book. The links will be shared using the students' WhatsApp group, so they could get the link then joined the try-out process. After the try-out data has been obtained, the researcher will revise some aspects that needed to be revised. On doing the second revision, the researcher worked with the creative studio to make a better quality of the product.

**FINDINGS AND DISCUSSIONS**

*Findings*

The product had been validated by two experts who were a lecturer and a teacher. The validation covered four aspects: the design and layout, program operation, content, and reading strategy. The first validation was done on October 1st, 2020 by an English Department lecturer of Universitas Negeri Malang. The lecturer was involved in the expert validation since she has experience developing technology-based instructional products and is interested in MALL. Overall, the lecturer gave positive feedback to the application regarding design and layout, content, and reading strategy. However, she gave a small revision to the program operation since the user interface in the drag-and-drop activity was not so smooth. The second validation was done on October 2nd, 2020 by an English teacher of SMKN 1 Grujugan. The teacher had a part in the validation since he has been teaching in vocational high school for years and observed smartphone use for the English teaching in school. The teacher
had similar comments with the lecturer since the drag-and-drop part was not so smooth. Besides that aspect, the teacher thought everything was good and the product was ready to be tried-out.

Discussions

There are four important points discussed in this study. The first is about the reading materials chosen. Since the targeted users of this study are in a vocational high school with an Agriculture study program, a text discussed a description of a machine used in the study program. Besides, another text discussed a description of the natural tourism spot where the students have probably known. The texts were selected and adapted carefully since Mukundan, et.al (2016) stated that the reader's interest and background knowledge should be taken into account when preparing the supplementary reading materials for students.

The second is about various reading activities provided by the application. Types of reading activities provided from the application were multiple-choice, true-false, crossing wrong words, short answers, and drag-and-drop. The activities were made varied since Setyowati (2014) stated that smartphones could create interesting and meaningful students' activities. Pictures, background music, and colorful pages were made to make students feel excited about using the application.

The third is the application can facilitate students with their independent learning process. Starting from the try-out stage, the teacher and the researcher only guided the students to access the links. After that, the students independently used the application. The show score and answer key feature also facilitated the students to use the application on their own. A study about students' perception by Almaiah & Jalil (2014) about mobile learning implementation shows that mobile learning would enable them to participate in the independent learning process.

The fourth issue is the application can be used inside and outside the classroom and with or without an internet connection. The users only need an internet connection at the beginning when they want to download the application and use the 'share score' feature.

In terms of weaknesses, the application was made for Android users only. iOS users cannot run the application on their smartphones. Another weakness is related to the users' storage capacity. Since the application can run once it has been downloaded, users with low storage capacity will not be able to download and install the application to their smartphones. The last weakness is the application still cannot save the users' answers. Once the application page is closed, the
users need to fill in the answer box again. However, the researcher is still trying to find the solutions for the last weakness of the product.

CONCLUSIONS AND SUGGESTIONS

Conclusion
There are two important conclusions from the development of a supplementary reading materials prototype. The first is the use of the application as supplementary reading materials for descriptive text and the second is the use of the application in teaching reading. The application has made reading text is not limited to printed text only. The students can read the text and answers the reading exercises using their smartphones. Besides, they can get the results of the exercises they have done immediately. Since the application was designed as supplementary reading materials, the application contains three different descriptive text, an explanation of the social function and text structure, and various reading activities to check students' understandings of the text. The activities were also designed from the pre-reading, whilst-reading, and post-reading stage.

Suggestions
Based on the research results obtained by the researcher, she suggests to the teacher to guide students on using mobile phones wisely since there are a lot of English learning materials provided from the internet nowadays. The product of this study is one of the examples that can be used. However, although the product already contains the text, reading exercises, and explanation about the social function and text structure, the teachers still need to explain the materials further.
For future researchers who are interested in integrating mobile learning with the devilment of English instructional materials, they might develop other products which are based on different basic competence or focus skills.

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