'Smart Technical English' Android Application to Improve Students English Skills

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Abstract— **Students of Shipbuilding Institute of Polytechnic Surabaya (PPNS) get difficulties and are less motivated in learning English, which can be seen from their low score on TOEIC. Therefore, we develop an Android-based 'Smart Smart Technical English' application to improve their English skills. The software used in this research is React Native, and the development method is System Development Life Cycle (SDLC) prototyping model. Designed exclusively based on the English curriculum in PPNS, 'Smart Technical English' comes with interesting images, videos, quiz, and vocabulary enrichment to trigger students motivation in learning English. By developing and applying 'Smart Technical English', students are expected to be more motivated and really into learning English, thus boost their skills.**

Keywords—Smart Technical English, android application, SDLC

I. INTRODUCTION

Graduates of polytechnics are demanded to be highly competitive in the AEC era. Therefore, they must impose good command of English as international language, to get qualified jobs. However, most polytechnic students think that English is not as important as their subject matter. This is also worsened by the fact that the students do not have sufficient time and energy to learn English outside of the classroom as they have hectic schedule with a lot of homework from their major courses. Thus, carrying the mission to answer these kinds of problems and challenges in English teaching, polytechnic teachers should come with appropriate and powerful approach, method, or tools. The latest emphasis should be in the concept of interactive learning which focuses on the use of mobile phone and social network. According to [1] interactive learning and perfect interaction between students and their teachers requires a technological engagement. Students can use the gadgets such as mobile phones and tablets as a learning device that makes m-learning a new solution in enhancing learning activities. Nowadays almost all Smartphone come with the Android operating system which allows users to communicate with anyone at any time everywhere almost instantly and without obstacles. Most students nowadays have Android phones where they can download a variety of interesting and useful applications. [2] [3]

Actually, there is a great opportunity to make learning English more fun and interesting, considering that the majority of students in Shipbuilding Institute of Polytechnic Surabaya have been using Smartphone with android operating system. They have even used apps from Play Store to simplify their learning activities such as calculator, English dictionary, and document scanner. With this technological developments, it is possible to develop Android-based applications that support students to learn English wherever and whenever they want. Some students have familiarized themselves with Android apps like DuoLingo, Engineering Dictionary, and Learn English Conversation to help them improve their English. In DuoLingo, students can learn about English vocabularies and phrases in a very fun way. [3] There are options about how long the students want to learn using the application. However, this application does not include English Engineering vocabulary. In other application, namely Engineering Dictionary, students are exposed with lists of words related to engineering. Nevertheless, this app covers definition only and it does not facilitate students to learn about processes related to the technical terms. As for Learn English Conversation, it does not specifically provide engineering or technical vocabulary that are needed by Polytechnic students. Therefore, we develop Android-based 'Smart Technical English' applications to support the students in learning ESP (English for Specific Purpose), enhance their skills and at the same time improve their TOEIC score. This app does not only cover Engineering vocabulary in general, but specifically to the field of Maritime, Electrical, Safety, and Manufacturing. It is expected to be a great tool for students to be proficient in communicating using the terms in the field of Engineering. This "Smart Technical English" is also equipped by attractive images and videos, and even more interesting, the menu or content is designed specifically to each study program in PPNS.

II. THE PROTOTYPING PROCESS

We use SDLC model as the method for developing "Smart Technical English" application. It comes with a set of development phases in which each phase uses the results of the previous one [4]. The phases are analysis phase, designing phase, programming phase, testing phase and maintenance phase. As SDLC has been around for a long time, many variations have been created, starting from Waterfall, prototyping, to the newest model [5]. However, for this research, prototyping model is used based on certain considerations related to its advantages.

Prototyping model offers the best approach since we are unsure of the efficiency and the adaptability of "Smart Technical English". [6] The prototyping paradigm begins with requirements gathering. Here we meet the English

teachers and students as users to define the overall objectives for the software, identify the requirements, and determine some areas where further definition is mandatory. The prototype is evaluated by the teachers and students and then used to refine the needs of "Smart Technical English" to be developed. Iteration is needed as the prototype is built to satisfy the needs of English teachers and students. Meanwhile, it also enables us to better understand what requirements to be done.
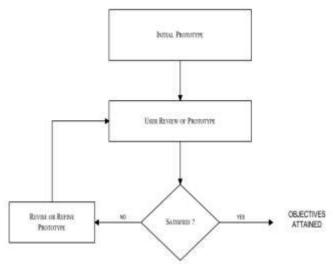

Fig 2.1 The prototype model adapted from [7],[8]

The software used by We to develop the "Smart Technical English" app is React Native. React is an open source Java Script library used by developers to create web user interfaces. React Native assists developers to build mobile apps by using only JavaScript. It uses similar design as React, enabling developers to compose a rich mobile user interface by combining fundamental user interface building blocks together with the assistance of JavaScript and React.

A. Analysis of Requirements

At this stage, we gained information regarding the students, lecturers and the materials taught in every study program. In order to obtain this information, observations and interviews were conducted toward subject matters lecturers and students. Need analysis of the English vocabulary that are presented in Smart Technical English android application was conducted. Several aspects of learning were also planned, starting from determining the Competency Standards, Basic Competencies, indicators and learning objectives.

B. Developing the Prototype

When the need analysis of the materials is completed, the next step is develop the prototype of the Smart Technical

English application. The software used to develop the "Smart Technical English" app is React Native. React is an open source Java Script library used by developers to create web user interfaces. React Native assists developers to build mobile apps by using only JavaScript. It uses similar design as React, enabling developers to compose a rich mobile user interface by combining fundamental user interface building blocks together with the assistance of JavaScript and React. This initial product is then validated by media experts and materials experts. The purpose of the validation is to obtain input and justification from experts related to the validity of the material and strategy for presenting material through the application.

C. User Testing and Feedback

This stage is a trial phase of Smart Technical English app. The app was applied to 120 students in 4 different study programs, namely Safety Engineering, Marine Engineering, Electrical Engineering, and Shipbuilding Engineering. This process also involved at least 4 English lecturers. Lecturers send students responses were obtained through interview and questionnaires to determine the feasibility of the application in the English learning process. Moreover, through questionnaires and interviews, suggestions for improvement of the app were also obtained.

D Product Revision

This stage is the stage of improvement based on the response and suggestions from lecturers and students.

III. SMART TECHNICAL ENGLISH APPLICATION

A. 'Smart Technical English' Quiz

We set the menu of "Smart Technical English" app by considering the level of vocabulary and also TOEIC. When the app is started students are presented with 2 options: Quiz and Vocab. When they click Quiz, they are directed to Quiz and TOEIC practices. Meanwhile, when they choose Vocab, they will be directed to 4 different majors where they can choose based on theirs: Shipbuilding engineering, Electrical Engineering, Marine Engineering and Safety Engineering. When students choose one of the departments, they will come to a Quick Guide menu where a set of terms related to their study program is presented. When they choose one of the term, they will be provided with a definition along with the image, video, as well as related words. Here they will learn about making definition.

Fig. 2.2 The Quiz on vocabulary

When students come to the Quiz on vocabulary, they will see some pictures. They must select the best picture representing the title. In the next level of the Quiz on vocabulary the students are given some pictures and they are asked to type the definition of the object/tools shown in the picture. In this part, the students will learn how to write good sentences and good definitions.

B. TOEIC Practices

The next option on the Quiz menu is TOEIC Practices. Here students are provided with a variety of TOEIC listening and reading practices.
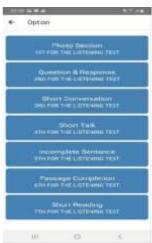

Fig 2.3TOEIC Practices

In figure 2.3 shows that there are seven parts of English testing offered including photo section or picture description, question and response, short conversation, short talk which belong to listening section, and incomplete sentence, passage completion, short reading which belong to reading section. To get the application students must install it to their adndroit

When students click photo section, they will find some pictures and listen to the description of the pictures. They must select correct picture that is described through the audio. The TOEIC Listening Practices including the images are depicted on Fig 2.4 and Fig 2.5.
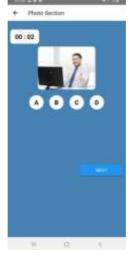

Fig 2.4 Photo Section   Fig 2.4 Photo Section

After the students finish listening to the photo section or pictures description, the student can continue the next part by choosing the 'next' button until they finish all parts of the test.

C. Students' Perception and Discussion

The next step in the Prototyping process is testing the application. In this stage students give their perception on the the prototype of 'Smart Technical English. Students give feedback on it and are interviewed in order to know the usability of the application. Here we use Likert scale items of the questionnaire. The questionnaire is proven to be reliable ($p= 0.76$). On the other hand, questionaires are analyzed by using coding method of content analysis. Positive orientations are found.

TABLE I.   Positive orientations of 'Smart Technical English'

No	Aspect	Score	Category
1	Design	31.80	Good
2	English Materials and Activity	34.84	Good
3	Learning Improvement	25.19	Good
4	Ease of Use	12.68	Good

When we analyze the students'questionaires, it was found that most of the students thought using "Smart Technical English" helped them revise their improve their english. Other students had the opinion that this application has appropriate English vocabulary they need related to their major. Some other students highlighted that the application is easy to use and has entertaining design.

IV. CONCLUSION

Mobile learning has proven to be effective to enhance students learning. When it comes to teaching Polyechnic students, smart android application is considered an effective

tool to motivate them to learn English. By using SDLC prototyping model, We develop an Android-based 'Smart Technical English' application to support English teaching and learning process in PPNS. This application is also equipped with attractive visual images, videos, dictionary and quiz designed specifically for each study program in PPNS. Students' perception on the application leads to positive orientations of the application. Hence, in the future it can help students improve their English skills.

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