

The Use of The Android-Based Game to Enhance English Vocabulary of Students with Hearing Impairment in Inclusive Schools

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This study aimed to describe the use of an Educational Vocabulary Game (EVG) application to improve the English vocabulary and designed to test the practicality and effectiveness of an EVG application in improving functional English dictionary among students with hearing impairment in an inclusive school. This study was development research, which involved several steps, including concepts, design, material collection, manufacturing, and field testing. Data were collected through observations and tests. Participants were twenty students with hearing impairment and five teachers in an inclusive school in Indonesia. The results of the study showed that the average score of the pre-test was 6.5, while the average rating of the post-test was 8.9. Moreover, the highest score of the post-test was 9.5. Furthermore, the practicality test reported a score of 98.66%. Based on these results, the use of the EVG application was useful and practical to improve the learning outcomes on English vocabulary among students with hearing impairment in an inclusive school.

Keywords: *Android-base game, hearing impairment, students, vocabulary.*

Introduction

The implementation of inclusive education requires an understanding of teachers who have the competence to organise learning for students with special needs (Tzivinikou, 2015; Kuyini, Yeboah, Das, Alhaasan, & Mangope, 2016). Students with special needs are students who experience learning disabilities due to physical, mental, intellectual, emotional and social limitations, which are further grouped into several types, namely: visual impairment, hearing impairment, intellectual disability, health disorders, autism spectrum disorder, specific learning difficulties, slow learning, and a combination of several types of these disorders (complex disorders).

Particularly in inclusive schools, the number of students with hearing impairment is quite high. Winarsih (2007) stated that the definition of hearing impairment is "someone who has a deficiency or loses the ability to listen to either partly or wholly due to the partial or total deafness of the hearing organs so that the individual cannot hear generally in daily life. This has an impact on his/her life in a complicated way, especially on language skills, which are essential communication tools (Netten et al., 2012; Moeller & Tomblin, 2015).

According to Suyanto & Mudjito (2012), the existence of services for students with hearing impairment in inclusive schools had raised concerns in the learning process because it was considered to hamper the progress of regular students, at the most extreme levels deemed to be able to disrupt the comfort and fluency in regular classes; this happened to schools that were contra towards inclusive education (Hermanto, 2011). It takes innovation from educators in teaching students with hearing impairment in inclusive schools. The development of media based on the characteristics of students with hearing impairment in learning will help the effectiveness of the learning for students with hearing impairment (Kwon, 2010; Pradina, et al., 2017; Roth & Vicki, 1991).

Learning the English vocabulary generally is not taught implicitly in the learning process, and there is no specific time to explain it to students. Learning English can be understood by understanding communication skills (Derakhshan & Khatir, 2015; Hsu, 2017; Wang, Teng, & Chen, 2015). Vocabulary has a significant role in learning English, the more vocabulary a person has, the faster the ability to speak English. A similar statement was also conveyed by Cuticelli, Coyne, Ware, Oldham, and Loftus (2015) and Tosun (2015), who stated that vocabulary learning needed an integrative holistic approach to support vocabulary development among students. Furthermore, Sidek and Rahim (2015) reported that vocabulary plays an essential role in the language learning process. Even though the dictionary is not the main thing in language learning, the part of vocabulary is significant. Many experts now emphasise that a systematic approach to vocabulary learning is needed. One of the drivers of increasing vocabulary in language learning is the development of communicative approaches and methods that emphasise understanding.

In explicit vocabulary learning, students carry out activities that are designed for vocabulary. In the context of the current curriculum; vocabulary is essential when students are required to "respond to meaning" and "express meaning." Without adequate vocabulary mastery, students will not be able to meet the demands of the curriculum. Therefore, a fixed teaching method in learning vocabulary is needed. Sokmen, as cited in Kalajahi & Pourshahian (2012), explained some explicit principles of vocabulary learning. These principles include enriching vocabulary, integrating new vocabulary with already mastered vocabulary, providing new vocabulary, increasing understanding, helping to understand the meaning, using various techniques, and encouraging the use of independent learning strategies. Vocabulary in language learning as a communication tool and learning one of the linguistic elements that do

not get a special allocation of time in school, the teacher needs to pay attention to how to explain new vocabulary so that students can master it.

The phenomenon that occurs in inclusive schools is that individual education teachers in inclusive schools have difficulty in delivering English lessons (Florian & Rouse, 2014). Particularly in teaching vocabulary for students with hearing impairment in inclusive classes, the tendency of providing learning material is done verbally. In the inclusive class, two students must be accommodated, namely students with special needs and typically-developing students. Students with hearing impairment in inclusive schools have a visual learning style; the use of educational games with exciting features are expected to be able to meet the needs of students with hearing impairment (Girgin, 2013; Lidström & Hemmingsson, 2014; Willis, Goldbart, & Stansfield, 2014). This game is displayed in a compelling visual; this is made because of the characteristics of students with hearing impairment who are utilising their visual organs more in the learning process. One concept of this game is learning while playing and having fun, and learning can be anywhere and anytime. This educational vocabulary game (EVG) will be installed on an Android-based mobile phone.

The use of applications that are widely used nowadays is the Android-based applications. Android is an operating system for mobile devices released by Google Inc. in November 2007, which is based on Linux, which includes an operating system, middleware, and applications. The growth of Android is growing rapidly because of the complete platform and the very high support of the open-source community in the world, so it continues to grow both in the technology and the number of devices in the world. This operating system is open source so developers can create their applications for mobile devices.

The use of a mobile phone for learning is widely accepted. Sharples (2005) stated that some researchers think mobile learning is recommended for education because it enters a new era of improvement in learning technology. Moreover, Miller (2008) argued that games in knowledge could be used to explain concepts and strengthen education. In the game, students find that learning is a process of developing cognitive and social abilities. A similar opinion was stated by Smaldino, Lowther, and Russel (2011), who described that interactive multimedia helped support the learning of students with special needs. Also, Miarso (2004) argued that one of the characteristics of sound learning is to have the criteria of attractiveness, effectiveness, and efficiency. This is in line with the features of students with hearing impairment. Indeed, there was a previous study on improving vocabulary mastery which was carried out by Aswar (2012), the results showed that there was an increase in knowledge of English vocabulary among students with hearing impairment by using flashcards. However, this current study is different as this research used interactive multimedia.

Based on the results of previous studies and supported by phenomena that occur in the field, researchers who are special education teachers in inclusive schools, make learning innovations for students with hearing impairment who are in the inclusion class by making media in the form of applications to improve their mastery of English vocabulary called the Educational Vocabulary Game (EVG). Therefore, this study aimed to describe the EVG use to improve English vocabulary, and test the practicality and effectiveness of EVG applications in improving functional vocabulary in students with hearing impairment in inclusive schools.

Methods

This study was a development study. An EVG application was developed to improve the mastery of English vocabulary among students with hearing impairment in inclusive schools. Data were gathered through a questionnaire and test. Data were analysed in a way to obtain a clear picture of the results of the effectiveness and practicality of using EVG media in English learning for students with hearing impairment in inclusive schools. The research subjects were 20 students with hearing impairment and 5 individual education teachers at an inclusive school in Pasuruan City, East Java Province, Indonesia.

Results and Discussion

The Description of The EVG Application

This application consisted of eight menus namely, the Profession menu as access to the Profession Game, the Fruit menu as access to the Fruit Game, the Animal Sample menu as access to the Animal Game, the Transportation menu as access to the Transportation Game (transportation tool puzzle game), Home Appliances menu as access to the Home Appliances Game (guesses the names of devices at home), School Tools menu as access to the School Tools Game (school tools puzzle game), the Colour menu as access to the Colour Game (guess the colour game), and the Exit menu as a way to exit the application.

The Effectiveness of EVG Application in Enhancing English Vocabulary

Results of data analysis showed that there was a difference, namely improvement, after using EVG products on the mastery of English vocabulary among students with hearing impairment. The first step, which was implemented before treatment, was ten vocabularies in English that were previously mastered by students. Then students wrote the name of the object. The results of the gain score calculation was 0.77 with an average score of pre-test score was 6.5 while the average of post-test score was 8.9, with a maximum score of post-test was 9.5 From the above analysis it was found that the results after using the EVG application media were higher than the results before applying the EVG.

The Practicality of EVG Application in Enhancing English Vocabulary

The subjects of this study were students with hearing impairment of grade seven in an inclusive junior high school. Students were already able to operate an android mobile phone. The questionnaire was given for the students, which has 12 question items that were grouped into 4 indicators, namely: (1) Media format, (2) Quality of illustration, (3) Clarity of media presenting concepts, and (4) Student interest. Based on this questionnaire, it was found that the average score of the Vocabulary Game Education products was 3 = high enough, 4 = high. Moreover, the average overall percentage regarding the quality of English vocabulary learning with the Vocabulary Game Education media was 95.36%. The response of individual education teachers in inclusive schools found an average rate of 85.95%. This shows that the developed media product has an adequate practicality value in improving the understanding of students with hearing impairment in learning English vocabulary.

The development of learning media for inclusive students in this study was intended for students with hearing impairment; teachers must innovate to provide learning based on the characteristics and learning styles for students with special needs in inclusive schools. Learning management for students with special needs in inclusive schools was explicitly designed by educators in inclusive schools.

Choate (2004) stated that learning services for students in inclusive schools empirically show significant differences in characteristics. The first failure is a failure in the concentration of attention by students, inability to read, unable to follow the rhythm, or general learning models, socio-cultural or economic pressure. Further failures are formal, and by the diagnosis that they are categorised as persons with disabilities, so special teacher educators are needed, so that learning is also based on student characteristics.

The EVG application aims to help students with hearing impairment improve their English vocabulary. This application was designed based on the needs of students with hearing impairment that was more visual and supported with an attractive animated image display. As for the advantages in this EVG Application product: it is flexible and can improve the ability of children with disabilities to improve vocabulary, in this case, the vocabulary of objects (nouns) in everyday life consisting of vocabulary on Profession, Animal, Fruit, Home Appliances, Transportation and Colour. Because of the limited language ability of students with hearing impairment, students with hearing impairment, therefore, need visual media that can be combined with interactive media according to their characteristics. This is following the opinion of Smaldino, Lowther, and Russel (2011), who explained effective interactive multimedia for specialised learning, namely students who are at risk, students with diverse cultural backgrounds, and students with disabilities.

The use of EVG to improve English vocabulary is more fun, exciting, and suitable for use as a learning medium compared to other media. This is following Munir's opinion that interactive multimedia as a media is exciting because it can touch most of the five senses: vision, hearing, and touch (Munir, 2013). Multimedia, if properly utilised, can be used as a reliable educational medium compared to other media; multimedia is also able to combine the benefits of various media ranging from text, images, sound, and animation in digital units. One example of interactive multimedia is gaming.

Audio added to the EVG application is true and false when answering correctly and incorrectly. The audio for the pronunciation of the correct answer is made to hear the original sound recorded in the game Fruit, Home Appliances and Colour during the application assembly step. Munir (2013) said that audio or noise is in the form of music, narration, or other sounds that can be heard. This audio is used to optimise the residual hearing in students with hearing impairment: To practise the utterance, try to pronounce the type of questions displayed.

The visual component in the EVG application includes instructions, writing, and text. Guidance is in the form of navigation menus, when the game is running and display pictures and English vocabulary in the form of written text, so as to train children with hearing impairment to understand it better. This is in accordance with Munir's (2013) opinion that writing is one of the multimedia components. The document used in the application aims to help students with hearing impairment to practise reading in English.

The effectiveness of EVG application products based on the results of the effectiveness analysis of the pre-test and post-test in learning English vocabulary, is proven to be able to improve learning outcomes of English vocabulary. According to Sadiman et al (2011), one of the advantages of the game as an educational medium is that the game is something that is fun and entertaining and allows active participation of students to learn. EVG to improve the English vocabulary of students with hearing impairment is effectively used as a learning medium for students with hearing impairment in inclusive schools.

Based on the findings, the use of EVG can facilitate students in the learning process, which ultimately shows the achievement of improved learning outcomes, as indicated by the acquisition of the value obtained. The results of a questionnaire were that from students who said that the educational game was straightforward and helped them to learn independently outside the hours and hours of learning that were felt to be very limited.

Schunk (2012) argued that learning should be based on learning theories, which is the perspective theory that provides a reference on how to overcome learning problems. This perspective theory must pay attention to the three variables that have been mentioned, namely the variable conditions, methods, and learning outcomes, so that the making of innovations



by individual education teachers in inclusive schools has a significant impact on the effectiveness of learning English vocabulary for students with hearing impairment in inclusive schools.

Conclusions

EVG application is android-based interactive multimedia to improve the mastery of English vocabulary in students with hearing impairment in inclusive schools. Innovations are made by individual education teachers in inclusive schools to accommodate learning between inclusive and regular students. The EVG application is proven effective based on the results of an analysis of the effectiveness of the product shown to be able to improve the mastery of the English vocabulary. The EVG application has also proven to be practical in use based on practicality analysis, to enhance the skill of English vocabulary of students with hearing impairment in inclusive schools. The EVG Application Product is expected to be widely disseminated and used by individual education teachers in inclusive schools to improve English vocabulary learning.

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