Students' perception towards android as an instructional media

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Abstract: This study aimed at describing the perception of vocational high school students towards android-based mobile learning including the display, accessibility, and benefit of instructional media that had evidently improved their learning outcomes. The research sample was taken purposively, that was an experiment class consisting of 37 students. The data gathering technique employed the questionnaire of media perception developed according to Lewis's perception theory. The research result showed that the students had positive perception towards mobile learning on its display, accessibility, and benefit.
Keywords: perception, mobile learning, android-based learning media

INTRODUCTION

The vast-developed communication and information technology has changed human's lifestyle in several life aspects, such as job, transportation, communication, social life, and education. In the 21st century of education, teachers and students are demanded to have communication and information technology-based teaching and learning ability. Each individual is required to have both sufficient hard and soft skills so that they are able to work and compete in the working world. Trilling and Fadel (2009) said that "the core subjects and interdisciplinary 21st century themes are surrounded by three sets of skills most in demand in the 21st century: (i) learning and innovation skills, (ii) information, media and technology skills, (iii) life and career skills" (Scott, 2015). National Education Association (2002) also expressed the same idea that one of the 21st century skills is Learning and Innovation Skills that consist of four aspects; they are critical thinking, communication, collaboration, and creativity and innovation or 4Cs (Roekel, 2010). According to Kurfiss (1988), critical thinking is a study aiming at reviewing a situation, phenomenon, question, or problem to get a hypothesis or conclusion that integrate all available information so that it can be confidently justified (Berlet, 2014). The second aspect, communicating skill, is the first level of soft skills to be mastered (Patacsil & Tablatin, 2017).Somebody who has good communication skill is he/she who is able to utter his/her ideas to others (Lunenburg, 2017). In the meantime, Robles stated that integrity and communication are two main soft skills needed by workers to be successful in their work (Robles, 2012). Collaborating skill is the ability to work together, make synergy, adapt in several roles and responsibilities, empathize properly, and respect different perspectives. The fourth aspect is creativity that is any act, idea, or product that changes an existing domain, or that transforms an existing domain into a new one. What counts is whether the novelty he or she produces is accepted for inclusion in the domain (Burns & Ellis, 1970).

In developing the 21st century learning, teachers should change the traditional learning style in which they become the center of learning (teacher-centered) into student-centered learning. In the traditional learning, teachers have a very big role. Students, on the contrary, are passive, just sit, and listen to. According to Nichols "..the approach should be student-centered learning, students do not just sit, listen and memorize the material, but instead seek to construct their own knowledge. For that need to facilitate the students to be active, providing learning materials to encourage students to construct their own knowledge and participate in their social environment" (Putri, 2017). Moreover, Nichols mentioned the four main principles of the 21st century learning, which are: (1) Instruction should be student-centered. The learning should use student-centered approach; (2) Education should be collaborative. Students must be taught to be able to collaborate with others; (3) Learning should have context. Learning is

meaningless if it does not have any impact to students' life outside school and (4) *Schools should be integrated with society*. To prepare students to become good citizens, schools should facilitated students to get involved in their social environment (Putri, 2017).

The demands of the 21st century learning as mentioned above implies the use of communication and information technology intensively as instructional media. The term "instructional media", according to Romiszowski refers to devices and materials employed in teaching and learning. It includes hardware like blackboards, radio, television, tape recorders, video tapes and recorders and projectors; and, software like transparencies, films, slides, teacher-made diagrams, real objects, cartoons, models, maps and photographs (Romiszowski, 2008). According to Smaldino et al. (2008), media refers to anything leading to information between a source and a receiver. The six basic categories of media area text, audio, visual, video, engineer, and people. The purpose of media is to make communication and study easier (Smaldino et al., 2008). In another point of view, Heinich et al. (2002) defined instructional media as something that delivers information from a source to a receiver and they transfer an information in an instructional purpose such as video, television, diagrams, printed materials, computers and instructor (Heinich et al., 2002). It shows that instructional media takes an important role in learning process since it functions as teacher' message sender to be received clearly by students and vice versa. It can also facilitate the fulfillment of teacher's function in presenting the information/content so that students can study more actively according to each of their means and speed.

The use of ICT in learning has brought out a relative-new-learning process, which is E-learning whom Abbad et.al defined "… any learning that is enabled electronically. In essence, e-learning is a computer-based educational tool that enables students to learn anywhere and anytime. Today, E-larning is mostly delivered through the internet, although in the past it was delivered using a blend of computer-based method like CD-ROM"(Abbad et al., 2009). As it developed, there was mobile learning that is according to Hidayat and Utomo (2014) can be defined as a service that gives general information electronically to the learner. Expressing the same idea, O'Malley et al. (2005) stated that, "*One definition that captures the dual perspectives of learner mobility and learning with portable technology is the following*: *Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies. Mobile learning can perhaps be defined as 'any educational provision where the sole or dominant technologies are handheld or palmtop devices'. This definition may mean that mobile learning could include mobile 'phones, smartphones, personal digital assistants (PDAs) and their peripherals, perhaps tablet PCs and perhaps laptop PCs, but not desktops in carts and other similar solutions. Perhaps the definition should address also the growing number of experiments with dedicated mobile devices such as games consoles and iPODs, and it should encompass both mainstream industrial technologies and one-off experimental technologies*(Traxler, 2005).

According to Almaiah and Jalil (2014), there are six differences between E-learning and M-learning. If E-Learning uses web-based protocol, so M-Learning uses WAP-based protocol. If E-learning's web is wired, so M-Learning's web is wireless. If E-Learning's accessibility is all places, so M-Learning's accessibility is all places and every time. If E-Learning's connectivity is through Intranet and Internet, so M-Learning's connectivity is through *mobile networks, GSM, GPRS, UMTS* dan *CDMA*. If E-Learning's tools are PC and laptop, so M-Learning's tools are *Mobile Phone, Smartphone*, and *PDA*. Finally, if the communication of teachers and students in E-Learning is *asynchronous* and *delayed communication*, so the communication of teachers and students in M-Learning*synchronous* and *instant communication* (Almaiah & Jalil, 2014).

Several studies have proved that Android-based M-Learning can be used as an effective instructional media. Several studies also have showed that mobile learning can improve study quality and learning outcomes. Other studies have explained the key factors of mobile learning as instructional media. It is important to note that the ownership aspect of mobile learning becomes the key of mobile learning's success. It supports the idea that mobile learning adoption is not a given, and students need help in using and understanding the value of using personal devices for learning activities (Tabor, 2016). In another words, students' positive perception towards mobile learning determines its effectiveness of. A study conducted by Pollara and Broussard (2011) shows that among the students (Rogers et al., 2010; Venkatesh, 2006), students are using these devices (PDAs, mobile phones, mp3 players) every day for entertainment as well as access to information, so the opportunity to use them for education as well seems to be an exciting next step in the use of these devices for students. Students' perception is a critical

piece of m-learning study, because positive experiences will encourage participation and acceptance of m-learning by those students (Pollara & Broussard, 2011). Thus, students' perception towards mobile learning also effects the effectiveness of mobile learning as instructional media.

Perception is an individual's view making it a powerful driving force for action. Processing sensory information and relating to past experiences enables one to create a lens in which to view the world through a filter of sociocultural influences (McDonald, 2011). Fundamental to perception is that there is an experiencing person or perceiver; secondly, that something is being perceived (either an object, person, situation or relationship); thirdly, there is the context of the situation in which objects, events or persons are perceived and finally, there is the process nature of perception starting with the experiencing of multiple stimuli by the senses and ending with the formation of percepts. Although it may appear from the above-mentioned to be a separated and slow process, cognizance must be taken that the formation of percepts takes milliseconds to complete and are not fragmented (Lewis, 2001). The theory truth has been proved in a study that states "…the students have positive perception towards mobile learning and would like to use their mobile devices for both learning and administrative services" (Almaiah & Jalil, 2014). It proves that Android-based M-learning is eligible and effective to be used as instructional media so that it can help teachers and students in the teaching and learning process. What are Indonesian students' perceptions towards m-learning? And, does positive perception towards m-earning give impact to better study learning outcomes? This study aims at describing students' perception towards Android-based instructional media that has evidently improved their study learning outcomes.

METHODS

This research was a descriptive research. The sample was taken purposively, that was an experiment class in Setiawan, et.al's study consisting of 37 students (Setiawan et al., 2018). The data gathering technique employed a questionnaire of media perception developed according to Lewis's theory of perception (Lewis, 2001). The aspect of media perception was elaborated in Table 1. The data analysis technique employed quantitative-descriptive method by counting range to determine the score range of each category in each aspect of perception and to count its percentage.

Table 1. The Aspect and Indicator of Students' Perception on Android-Based Media

Aspect	Indicator
Media Display	(1) Color; (2) Picture (3) Animation; (4) Letter; (5) Composition
Media Usage	(1) Operating Accessibility; (2) Tools Completeness; (3) Instruction Clarity; (4) Giving Feedback Quickly
Media Benefits	(1) Improving Motivation; (2) Improving Energy; (3) Improving Activity; (4) Facilitating Discussion; (5) Simplifying Concept Understanding; (6) Enriching Learning Resources; (7) Facilitating Independent Learning; (8) More Efficient Learning; (9) Improving Learning Outcomes

RESULTS AND DISCUSSION

Results

Based on the data analysis obtained from the questionnaire, students' perception towards Android media for its display aspect was shown by most of students (73.69%) who stated that Android-based media used was in the category of good. In the accessibility aspect, 71% of students mentioned that it was easy to be used. And, in the aspect of media benefit, 68.42% of students stated that Android-based media was beneficial for their study process and results. Table 2 and Figure 1 are the description of students' perception towards Android-based media.

Table 2. Students' Perception towards Android-based Media

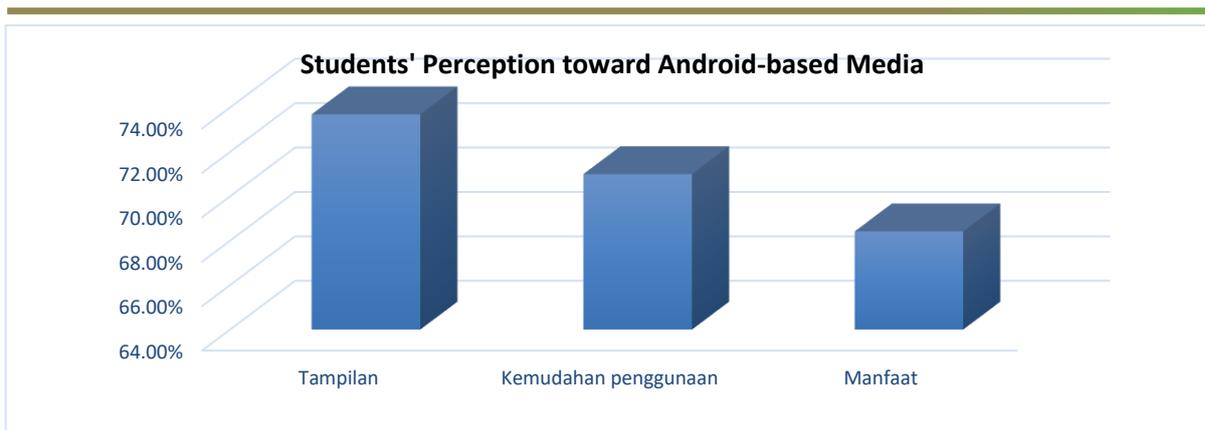| Aspect	Category	Total	Precentage
Media Display	Good	28	73.69%
Usage Accessibility	Easy	27	71%
Media Benefit	Beneficial	26	68.42%

Figure 1. Students' Perception towards Android-based Media

Discussion

The results show that students had positive perception towards mobile learning in the aspects of display, accessibility, and benefit. By having positive perception, students will be motivated to study so that their study learning outcomes will be better. As uttered by…, perception is a power that encourages somebody to do something/action. In the context of mobile learning, students' positive perception becomes such power to encourage them to study so that their learning outcomes will be better. A study conducted by Setiawan, et.al shows that there are differences in learning outcomes of students who are taught with instructional model of Inquiry with M-learning media with learning outcomes of students who are taught using expository learning model (t_{hitung} = 5,817> t_{tabel} = 1.995). So it can be concluded that there is a significant influence of the use of inquiry learning model aided by m-learning to the students' learning outcomes (Hermawan et al., 2018; Setiawan et al., 2018). The outcomes, definitely, relate with students' positive perception towards M-learning that they perceived to be able to improve motivation, enrich learning sources, facilitate independent learning, improve learning efficiency, and improve learning outcomes.

In several aspects, the results above are in line with several previous studies. A study on "Students' Attitudes and Perceptions toward the Effectiveness of Mobile Learning in University of Djibouti" indicates that mobile learning using SMS and Facebook could be used as supplemental tools to enhance students' learning to achieve their learning (Barreh & Abas, 2015). A study conducted by Kim, et.al entitled "Mobile learning: research, practice and challenges of Distance Education in China" suggested that mobile technologies have the potential to provide new learning experiences. In these experiences, students can engage more frequently in learning activities outside of class, providing them with more learning opportunities in their community of practice (Kim et al., 2013).

Another study conducted by Kaliisa & Picard on "A systematic review on mobile learning in higher education: The African perspective" shows that mobile learning within higher education institutions in Africa increased student and lecturer collaboration and, provided distant communication, increased student participation and engagement, facilitated authentic learning and reflective practice, as well as fostered learning communities. A change in the lecturers' approaches to teaching also occurred. The findings also indicate significant challenges in integrating mobile learning in higher education institutions within Africa: poor technological infrastructure, lack of access to modern mobile devices, lack of mobile learning pedagogical skills among lecturers, poor attitudes among students and lecturers, and incompatibility of mobile devices with the university online management systems. There were also policies to guide the implementation of mobile learning. The result of this survey clearly indicates that offering mobile learning could be the method for improving retention of B.A, and M.D. students, by enhancing their teaching/learning. The biggest advantage of this technology is that it can be used anywhere, anytime and adopt their mobile learning systems with the aim of improving communication and enriching students' learning experiences in their open and distance learning" (Kaliisa & Picard, 2017).

The study also found that students had positive perception towards the display and usage of instructional media in the M-learning. Students had good perception on the media display, specifically in the indicators of color, picture, animation, letter, and composition. The Android-based media used in

learning was also perceived to be easy to operate, have complete tools, have instruction clarity, and give feedback quickly. A study conducted by Sharples on shows that the factors influencing the success of mobile learning included: availability of technology, institutional support, connectivity, integration into everyday life, and ownership by the learners (Sharples, 2014). In the mean time, a study conducted by Alrasheedi and Capretz entitled Determination of critical success factors affecting mobile learning: A meta-analysis approach found that "The success of m-Learning is dependent on the views of the users of the m-Learning platform. It is seen that content is considered to have the most influence, followed by technical competence of learners, user friendly design, learner community development and ownership (Alrasheedi & Capretz, 2018). The previous statement also mentioned that a number of factors that determined the success of mobile learning were the importance of the pedagogical integration of the technology into the course assessment, lecturer modelling of the pedagogical use of the tools, the need for regular formative feedback from lecturers to students, and the appropriate choice of mobile devices and software to support the pedagogical model underlying the course (Cochrane, 2010).

CONCLUSION

The perception of vocational high school students towards Android-based media usage in learning covering the indicators of color, picture, animation, letter, and composition was good. The perception towards the use of Android-based media in learning was positive since it was perceived to be easy to operate, have complete tools, have instruction clarity, and give feedback quickly. Students' perception towards Android-based media was also positive since they felt that it gave some benefits for their learning process and outcomes. It could (1) Improve motivation; (2) Improve energy; (3) Improve activity; (4) Facilitate discussion; (5) Simplify concept understanding; (6) Enrich learning resources; (7) Facilitate independent learning; (8) Make learning more efficient; and (9) Improve learning outcomes. Good learning outcomes due to the use of M-learning has been proved by previous studies, as mentioned above.

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