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Development of Mobile Educational Game of Economics

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Abstract

Along the rapid development of Information and Communication Technology (ICT), learning media are required to undergo renewal. Innovation of learning media that combines modern technology is needed to improve the effectiveness of learning. The research is a Research and Development (R&D). The product result of this research is mobile educational game of economics. This research aims to determine the feasibility of mobile educational game of economics. Media feasibility was assessed based on the results of media-use response questionnaires that given to experts and students. Expert validation result showed that mobile educational game of economics achieved very good judgment. The assessment questionnaires result from the student also stated that the quality and effectiveness of mobile educational game of economics were very good. So, the research concluded that mobile educational game of economics worthy to be used as a media of economics learning.

Keywords: Educational Game; Economics; Mobile Learning

Introduction

Technology is considered as a new opportunity to improve the learning effectiveness (Callum., Jeffrey., Kinshuk., 2014). Although technology is considered playing an important role in the learning effectiveness but the conception about benefit of technology perceived by learners and teachers is still very limited (Corrin., Bennett., & Lockyer., 2010).

On the other hand, mobile learning is one form of learning innovations that needs to be considered because mobile learning will make the users access material easily anytime and anywhere. These advantages make the utilization of mobile devices such as tablets or smartphones are considered as effective instructional media (Hussin., Manap., Amir and Krish., 2012; Kutluk., and Gülmez., 2014). Moreover, mobile technology or mobile devices have been adopted immediately in daily life and it is commonly owned by most people.

The use of mobile devices such as smartphone among learners has also become a common phenomenon. Unfortunately, the use of smartphone among high school age children is still dominated for social media activities, chat and gaming. Based on survey www.emarketer.com as much as 82% using smartphone for social media activities, 76% for chat and 64% for playing games.

Though Kuss, Louws and Wiers (2012) said that game can create an addiction. However it becomes an opportunity if it is an educational game. The existence of educational games called mobile educational game is expected to increase learning motivation and affect students' learning outcome. Learning in the form of mobile learning also can develop cognitive and collaborative skills by encouraging students to cooperate in solving problems (Lee., Parsons., Kwon., Kim., Petrova., Jeong., Ryu., 2016).

Mobile educational game is a game designed for learning and can be played on smartphone or other mobile devices such as laptop or computer. The goals of mobile educational game or (Game Based Mobile Learning) are to increase learning motivation, to provide knowledge and to improve the effectiveness of learning (Goodman., Bradley., Paras., Williamson., Bizzochi., 2006; Prensky., 2001).

Although the development of instructional media based on mobile learning has been conducted a lot but instructional process by using game based mobile learning of economics is still limited. Several researches on economics education game have been conducted but none of them can be accessed in smartphone. Wijayanti (2016) developed a snake ladder economics game but the media was presented in the form of application that are played on a PC or laptop. Sriwahyuni and Mardono (2016) also developed educational game media in the form of economics quiz but this media was packaged in a compact disk (CD) and can only be run with a computer or laptop. Sriwahyuni and Mardono (2016) developed educational game instructional media in the form of economic quiz but this media can only be accessed via computer or laptop.

The development of mobile educational game of economics becomes a variety of interesting instructional media and it provides flexibility for students to learn. Mobile learning-based learning gives students the opportunity to access information whenever and wherever (Goksu., and Atici., 2013). Mobile learning based media is also an innovative and effective media for improving conceptual understanding (Sungkur., and Panchoo., 2016; Wu., Jim Wu., Chen., Kao., Lin., Huang., 2012).

Methododology

The type of this research is Research and Development (R&D) by following Borg and Gall's development research procedure which consists of research and information collecting, planning, develop preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, dissemination and implementation. The purpose of this research was to determine the feasibility of mobile educational game of economics from experts' and students' point of view.

The media validation of mobile educational game of economics was carried out through several stages of validation by experts covering material experts, media experts, linguists, and practitioners. Furthermore, the mobile educational game of economic media that has been assessed by the experts revised in accordance with the records in the assessment. In the next stage, mobile educational game of economics media was trialed to students. The trials were conducted through two stages. The first stage was a limited trial involving 30 students of class X IPS 5 in SMA Negeri 1 Bukateja. The second stage was a extensive trial involving 57 students consisted of 29 students of class X IPS 3 and 28 students of class X IPS 4.

The data were collected by questionnaires which were given to material experts, media experts, linguists, and practitioners. It was in the form of quantitative and qualitative. Qualitative data were obtained from suggestions or comments on media usage responses while quantitative data were generated from media assessment. Quantitative data from the questionnaire results were recapitulated and analyzed

by using Likert scale by giving a score from 1 to 4. After that the analyzed data were recapitulated and calculated the percentage. Then the obtained percentage was transformed into qualitative data to determine revision decision of product development. Furthermore, both data were analyzed descriptively.

Result and Discussion

The product was made by using some software. Illustrations of images and icons was created by using adobe illustrator CC 2017, interactive multimedia created by using adobe animate CC 2017 with actionscript 3.0, exported or published to PC by using flash player 23, exported or published to android by using adobe air 23.0 for android.

The result of product development produced instructional media in the form of mobile educational game of economics which is equipped with video and interesting game. The media is designed in offline mode to save internet quota. This mobile educational game of economics application can also be installed in smartphones and computers/ laptops, so it is easier to use.

This instructional media of mobile educational game of economics contains material about central bank and payment system. Overall the media content consists of materials and exercise questions. The material is created in texts, pictures and videos while the exercise questions is created in some interesting games. Meanwhile, the feasibility test of mobile educational game of economic was conducted by validation test by experts (material experts, media experts, linguists and practitioners) and students.

Fig. 1 Appearances of mobile educational game of economics

Media Assessment Result by Experts

The result of media assessment obtained from questionnaires to material expert, media expert, linguist, and students were quantized using Likert scale by giving score from 1 to 4. Then the data that has been scored is recapitulated and calculated the percentage by using the formula below:

$$P = \frac{\sum xi}{\sum x} x\ 100\%$$

Where:
P = Percentage of Assessment
$\sum xi$ = Amount of answers from subject
$\sum x$ = Amount of highest answer

The obtained percentage then transformed into qualitative data to determine revision decision of product development. The product assessment categorized as below:

Table 1 Assessment criteria

Interval	Criteria
81 % – 100 %	Very Good
61 % – 80 %	Good
41 % – 60 %	Fair
21 % – 40 %	Poor
0 % – 20%	Very Poor

Source: Riduwan (2009: 15)

The recapitulation result of media assessment questionnaires by material experts, media experts, linguists are shown in Table 2. The results of assessment by the material experts are known that total scores 86,9% with very good criteria. It included the content feasibility aspect scores 100% with very good criteria while the aspect of presentation feasibility gets 72.5% with good criteria. Furthermore, based on the results of assessment by media experts note that total scores 96% with very good criteria. It consisted of the display quality aspect that obtained a value of 95.83% with very good criteria while the technical quality aspects score 96.15% with very good category. The result of language component evaluation by Language expert got the value of 83,30% with very good criteria. The assessment results of material experts, media experts and linguists stated that the mobile educational game of economics is feasible for use in high school economics learning.

Table 2 Material experts, media experts, linguists assessment

Aspect	Scores	Total Scores	Experts
Content Feasibility	100,00%	86,90%	Material
Presentation Feasibility	72,50%		
Display Quality	95,83%	96,00%	Media
Technical Quality	96,15%		
Language Component	83,33%	83,33%	Language

The assessment feasibility of mobile educational game of economics media was also conducted by practitioners who include Ibu Kartika Dewi Mekarsari, S.E. as economics teacher of SMA Negeri 1

Purbalingga, Mrs. Hanifa Tsani Hasna, S.Pd. as an economics teacher of SMA Negeri 1 Bukateja and Ibu Rina Setya Harini, S.Pd. as an economics teacher at SMA Muhammadiyah 1 Purbalingga.

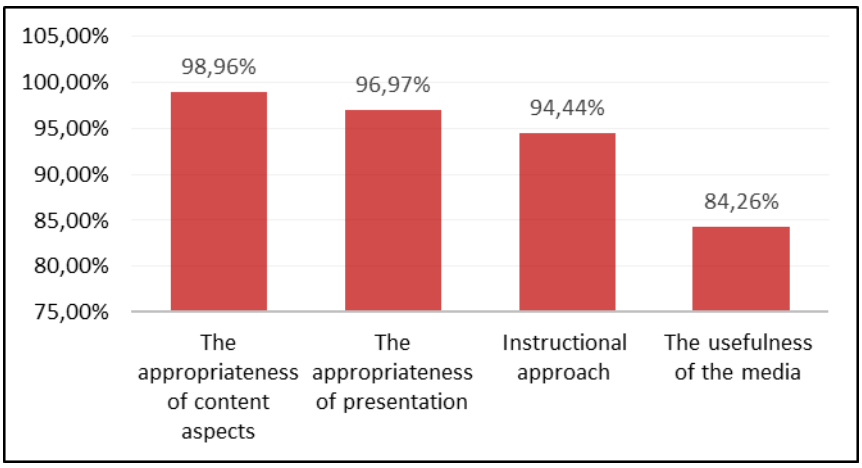

Fig. 2 Assessment result of practitioners

Based on Fig. 2. It shows that the appropriateness of content aspects, the appropriateness of presentation, instructional approach and the usefulness of the media got scores 98,96%; 96,97%; 94,44% dan 84,26% with very good category. It means that mobile educational game of economics media is appropriate to be used in economic learning.

Media Assessment Result by Students

The recapitulation results of the students' response questionnaires after using mobile educational game of economics media on limited trial and extensive trials are shown in Fig. 3. The media assessment by students includes assessments of media quality and media effectiveness. The quality aspects of the media include the assessment in terms of appearance and material relevance while aspects of media effectiveness include assessment in terms of ease of use, the ability to provide feedback and impact on learning outcomes.

Based on fig. 3, it is known that the media quality aspect on the limited trial gets 92% with the criteria of assessment is very good while the aspect of media effectiveness in the limited trial got 85% with very good assessment criteria while in the extensive trial stage, media quality aspects got of 93.77% with very good assessment criteria. Media effectiveness aspect in the extensive trial obtained a value of 92.11% with very good assessment criteria.

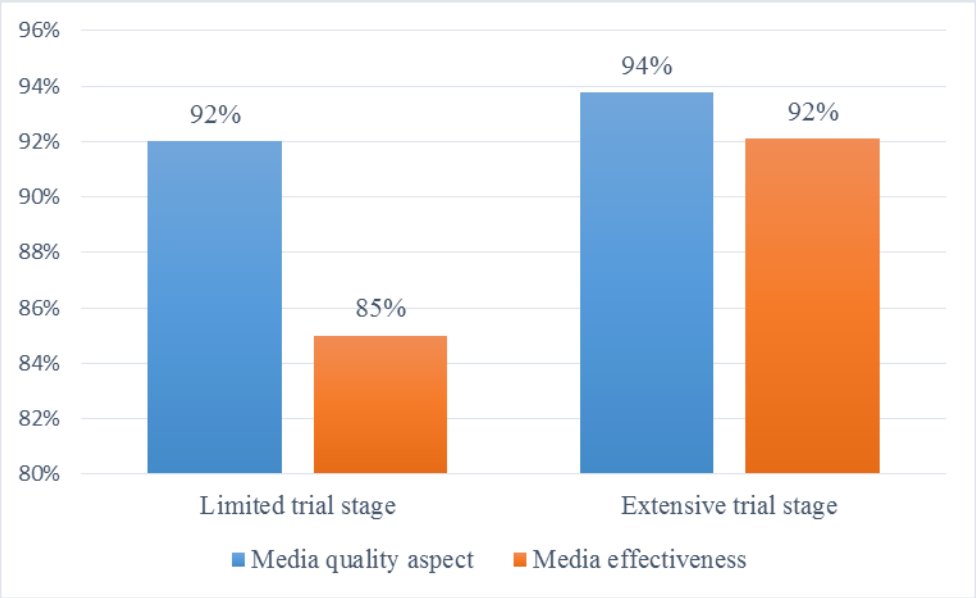

Fig. 3 The recapitulation results of the students' response questionnaires

Conclusions

Based on experts validation result, mobile educational game of economics declared valid or eligible as a media of economics learning with total scores 86,9% from material experts, 96% from media experts, 83,33% from linguists, and 93,63% from practitioners. It means that mobile educational game of economics got very good criteria. In limited trials and extensive trials which include students as research subject, this game gets scores 92% and 85% in limited trials meanwhile in extensive trials this game gets scores 93,77% and 92,11%. Assessment result in both of stages gets very good value for media quality and media effectiveness aspects. It means that mobile educational game of economics is also declared eligible for use in economics learning by students. So, it can be conclude that mobile educational game of economics valid or eligible as a media of economics learning.

However, the mobile educational game of economics has some limitations such as narrow material scope which only covers the material of payment system and central bank and the application capacity consumes a lot of storage capacity. Nevertheless, mobile educational game of economics consumes little quota because it is designed in offline mode so it does not require internet access at the time of its use, internet access needed at the time of installation only. This mobile educational game of economic also answers the limitations of (Wijayanti., 2016, Sriwahyuni., and Mardono., 2016) because this media can be accessed via smartphone or laptop or computer so that its use is more flexible.

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