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Development of Mobile Learning Based on Adobe Flash Professional CS6 on Android Material

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Abstract
The aim of this research is to develop a mobile learning application using Android-based Adobe Flash Professional CS6 on mechanical wave characteristics material for class -characteristics of mechanical waves for class XI high school. This type of research is research and development with the ADDIE development model. This model involves the stages of analysis, design, develop, implementation and evaluation. The instruments used were a material and media expert validation questionnaire conducted by a team of experts as well as a student perception questionnaire which was tested in one of the XI high school classes. The data analysis technique in the form of suggestions by the validator is carried out in a qualitative descriptive manner. Meanwhile, validation questionnaire scores and student perception questionnaires were carried out using descriptive statistics. The mobile learning application developed has .apk and .swf formats which can be run on Android smartphones and PC/laptops. The score resulting from students' perceptions of mobile learning applications is 50.35 and is categorized as very good.

Keywords: Android; Characteristics of mechanical waves; Mobile learning

INTRODUCTION

Learning is a process that is shown by changes in behavior where a person's condition is different from before carrying out the learning process and after carrying out the learning process. The learning process occurs when humans interact with their environment so that learning can occur anytime and anywhere (Ismawati, 2017). Changes occur as a result of experience or training carried out throughout life. To simplify and expedite student learning activities, learning facilities are needed (Aziz, 2018). One of the learning facilities needed is learning media.

Media is able to visualize the abstract material being taught, making it easier for students to understand (Asyhar, 2012). A similar thing was also stated by Hamalik in Arsyad (2014) who stated that the use of learning media in the teaching and learning process can arouse desire and interest, motivation and stimulation of learning activities, and even have psychological influences on students. Teachers can use the function of media to make the learning process fun and not boring (Mahnun, 2012). Media makes it easier for students to learn, provides concrete experiences, attracts attention, activates students' senses, and evokes the world of theory with reality (Primasari, Zulfiani, & Herlanti. 2014). Fun learning can be created through the use of interactive learning media so that it can make students enthusiastic about learning and understand the material more easily (Sriwahyuningsih &

Mardono, 2016). So learning media is anything that can be used to channel messages (learning materials), so that it can stimulate students' attention, interest, thoughts and feelings in learning activities to achieve certain learning goals (Pratomo, Sunardo, & Siskandar. 2016). The use of technology in the world of education, which has an important role, should be applied to the learning process (Meta, 2017). One of the physics materials that is considered difficult for students to understand is material relating to waves. This is due to the lack of learning media used by teachers to explain wave material.

Therefore, based on the data obtained from the results of the preliminary study, it can be concluded that there is an opportunity to develop an Android-based mobile learning application. The use of mobile devices in the form of smartphones in learning media is called mobile learning (Amirullah & Herdinata, 2017). Mobile learning is wrong. One alternative for developing learning media has practical characteristics and can be taken anywhere (Herdinata, Murwitaningsih, & Amirullah. 2018). With mobile as a learning resource for students, it is hoped that it can attract interest, increase the effectiveness and efficiency of learning. Apart from that, through the mobile learning application students can learn anywhere and anytime with just a smartphone.

Research regarding the development of an Android-based mobile learning application has also been carried out by Prayogi (2015) with the results of his research showing that this media is suitable for use to support the learning of class XI MIA high school students with a media suitability percentage of 86.25% (good). The weakness of the application developed by Prayogi is the unavailability of simulations and educational games that correspond to the material he developed.

The aim of this research is to produce a mobile learning application using Adobe Flash Professional CS6 based on Android on material on the characteristics of mechanical waves and to determine students' perceptions of the mobile learning application on the material on the characteristics of mechanical waves developed. So the question asked in this research is what is the final product of developing a mobile learning application using Adobe Flash Professional CS6 based on Android based on the characteristics of mechanical waves? And what is the student's perception of the mobile learning application based on the material on the characteristics of mechanical waves that was developed?

RESEARCH METHODS

The research used is research and development (R&D). The research steps used are in accordance with the workflow of the R & D method in Soenarto (2006). The development model in this research uses the ADDIE model. The ADDIE model is the ADDIE (Analysis, Design, Development, Implementation and Evaluating) model (Mulyatiningsih: 2012).

To test students' perceptions of this Android-based mobile learning application, researchers conducted research at SMA Negeri 10 Jambi City Class XI MIA. For data collection instruments, there are two types of data, namely qualitative data which uses closed questionnaires. Meanwhile, quantitative data uses a preliminary study questionnaire and a student perception questionnaire with an even-scale Likert scale. The questionnaire used to find out students' perceptions is a closed questionnaire where the questions are presented in such a way that respondents are asked to choose one answer that suits their characteristics.

RESULTS AND DISCUSSION

In this research there are 4 stages in accordance with the ADDIE development procedure. When carrying out validation, this research carried out several stages. The validation used is material expert validation and media expert validation. The following are the results of material expert validation in stage III.

Table 1 Results of stage III material expert validation

No	Statement	Validator	Information

	Aspect Fill out the Application *Mobile Learning*		
1.	Material which is loaded in application Already in accordance with curriculum Which applies (Curriculum 2013)	4	Without Revision
2.	Material which is loaded in application in accordance withCompetence Base	4	Without Revision
3.	Material which is loaded in application in accordance with objectivelearning	4	Without Revision
4.	The material contains 3 aspects of C4 cognitive abilities analyze (analyze, hook, conclude)	4	Without Revision
5.	Language Which used easy understood	4	Without Revision
6.	Equality mathematical can be read with clear	4	Without Revision
7.	Equality mathematical own information	4	Without Revision
8.	Picture in accordance with draft Characteristic features Wave Mechanic	4	Without Revision
9.	Animation in accordance with draft Characteristic features WaveMechanic	4	Without Revision
10.	Question exercise in accordance with material Characteristic features Wave Mechanic	4	Without Revision

Based on the table above, it is known that the material expert validator checked a score of 4 (very good) on all the criteria described. In table 2 below is stage III media expert validation

Table 2 Results of stage III media expert validation

No	Explanation Criteria	Validator	Information
A.	**Aspect Fill out the Application *Mobile Learning***		
1.	Language Which used easy understood	3	Without Revision
2.	No there is meaningful sentences double	3	Without Revision
3.	Completeness instruction use application *mobile learning*	3	Without Revision
B.	**Aspect Application Design *Mobile Learning***		
4.	Type usage And *font* size on writing	3	Without Revision
5.	Text readable with clear	3	Without Revision
5.	Space used consistent	3	Without Revision
6.	Animation relate And support explanation draft	3	Without Revision
7.	Combination color on the application *mobile learning*	4	Without Revision
C.	**Aspect Technical Application *Mobile Learning***		
8.	Simulation in application walk smoothly	3	Without Revision
9.	Knob navigation works with Good	3	Without Revision
10.	Knob navigation can operated with easy	3	Without Revision
11.	Navigation buttons are consistent throughout mobile learning content	3	No Revisions
12.	Navigation buttons have descriptions	3	No Revisions
13.	The mobile learning application can be installed (installed) on Android smartphones	3	No Revisions

Based on the table above, it is known that media I expert validators on average check the value 3 (good) on all the criteria outlined. So based on table 1 and table 2 it can be concluded that in stage III validation there were no revisions from expert validators. The trial was carried out in class XI MIPA 4 SMA Negeri 10 Jambi City, where the data taken was students' perceptions of the mobile learning application. Based on the questionnaire distributed, the following results were obtained:

Table 3. Results of student perceptions of mobile learning application development

Aspect Evaluation	Criteria	Score	Information
Design Learning	1. Instructions use media easy understandable	14.35	Very good
	2. Sequence presentation media clear		
	3. Media in accordance degan characteristics I		
	4. Display media (picture, color, graphic) interesting		

Material	5. Goals learning in media be delivered withclear	18.13	Very good
	6. Presentation of material in simple and easy media understood		
	7. Image And animation clear and easy understood		
	8. Media can help I remember materiallesson		
	9. Media make it easier I understand material		
Legibility Media	10. Sentences used in easy mediaunderstood	14.32	Very good
	11. Language Which used clear And simple		
	12. Appearance title And sub title media clear		
	13. Size letter on writing Already in accordance		
Quality Technical	14. Simulation can walk with fluent	7.06	Very good
	15. Knob navigation makes it easier I For exploreall over fill in application		
Average Aspect Whole		50.35	Very good

From the results of the feasibility test in the form of student perceptions at SMA Negeri 10 Jambi City as a whole, it can be concluded that the mobile learning application developed is suitable for use as an independent learning tool, especially for high school students on the Characteristics of Mechanical Waves material. This can be seen from the score which is categorized as very good.

The result of this research and development is a mobile learning application on the material on the characteristics of mechanical waves for class XI SMA which is named "wave-lets". The application has been validated by three validators in several stages and has produced a valid product in the very good category and suitable for use. The mobile learning application called "wave-lets" has specifications, namely .apk and .swf format which can be run on an Android smartphone with a minimum operating system version 4.4 (KitKat) or PC/laptop.

The applications that have been developed have advantages and disadvantages. The advantages of this application are that it is portable, flexible access, simple to operate and can also be used by teachers as a learning medium because it has a .swf format which can be accessed using a laptop. Meanwhile, the weaknesses are the lack of simulations, example questions in the material section, worksheets, videos or audio that support learning, and the lack of questions that can train students' thinking skills. This application is not yet connected to the internet (online) and has not been published on the Play Store.

Once developed, this mobile learning application was validated by three validators and declared valid. Next, this application was tested on thirty-one respondents. The mobile learning application developer shows and explains all the material contained in the application and then respondents fill out the perception questionnaire that has been given. The average overall aspect score of students' perceptions of mobile learning applications is 50.35 and is included in the very good category.

The product trial results may be suitable for use to improve cognitive abilities for students. This is supported by Woodill's (2011) statement which states that there are several benefits to this learning approach using mobile learning, one of which is that it can improve memory because it is used at the right time so that the information learned by students is easier to master and mobile learning is easier to master. equipped with mobile games and simulations can build knowledge for students. Apart from being able to be used to improve students' cognitive abilities, mobile learning can also increase motivation because ownership of a mobile device tends to increase commitment to using and learning it (Andy, 2007).

CONCLUSION

Based on the results of the development and trials that have been carried out, the following conclusions can be drawn: A mobile learning application can be produced as a physics learning medium on the characteristics of mechanical waves for high school students. This application is called "wave-lets"

and has .apk and .swf formats which can be run on an Android smartphone or PC/laptop. Apart from that, this application is also equipped with material descriptions, animations, evaluation questions presented in multiple choice form and games in the form of crossword puzzles. The weakness of this application is that it does not have simulations, example questions, worksheets and videos or audio that support learning. This mobile learning application has been validated by three validators and has a material expert validation score of 40 and a media expert validation score of 46 which is included in the very good category. Furthermore, the student perception score regarding the mobile learning application was 50.35 and was categorized as very good.

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REFERENCES

Amirullah, G., & Hardinata, R. (2017). Pengembangan Mobile Learning Bagi Pembelajaran. *JKKP Jurnal Kesejahteraan Keluarga Dan Pendidikan*, 4(02), 97. https://doi.org/10.21009/jkkp.042.07

Andy, Y. 2007. *Perancangan dan Implementasi Mobile Learning untuk Pembelajaran Bahasa Jepang Berbasis Brew*. Bandung: STEI ITB.

Arsyad, A. 2014. *Media Pembelajaran. Edisi Revisi*. Jakarta: Raja Grafindo Persada.

Asyhar, R. 2012. *Kreatif Mengembangkan Media Pembelajaran*. Jakarta: Referensi.

Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer Science & Business Media.

Hardinata, R., Murwitaningsih, S., & Amirullah, G. (2018). Pengembangan Mobile Learning Sistem Koordinasi Berbasis Android. *Bioeduscience*, 1(2), 53. https://doi.org/10.29405/j.bes/53-58121334

Ismawati, L. (2017). Pengaruh Media Pembelajaran dan Motivasi Berprestasi Terhadap Hasil Belajar Peserta Didik MAN Di Kabupaten Gresik. *Jurnal Pendidikan Ekonomi Manajemen Dan Keuangan*, 01(02), 091-104.

Mahnun, N. (2012). Media Pembelajaran (Kajian terhadap Langkah-langkah Pemilihan Media dan Implementasinya dalam Pembelajaran). *Jurnal Pendidikan Islam*, 37(1), 27–35.

Meta, M. R. (2017). Pengembangan Perangkat Pembelajaran Berbasis Web Pada Mata Pelajaran Kkpi Smkn 3 Padang. *Jurnal Sains Dan Informatika*, 3(1), 17. https://doi.org/10.22216/jsi.v3i1.2343

Mulyatiningsih, E. 2012. Metode Penelitian Terapan Bidang Pendidikan. Alfabeta : Bandung.

Pratomo, W. D., Sunardo, A., & Siskandar. (2016). Pengembangan Buku Pintar Elektronik Sebagai Media Pembelajaran untuk Siswa Sekolah Dasar. Indonesian Journal of Curriculum and *Educational Technology Studies*, 4(2), 66–72. https://doi.org/http://dx.doi.org/10.15294/ijcets.v3i1.8675

Prayogi, R. 2015. *Pengembangan Media Mobile Learning Fisika pada Handphone Android Berbasis Adobe Flash Professional CS6 Untuk Siswa SMA Kelas XI*. Jakarta.

Primasari, R., & Herlanti, Y. (2012). Se-Jakarta Selatan. *Edusains*, vi(01), 68–72.

Soenarto, "*Metodologi Penelitian Pengembangan untuk Peningkatan Kualitas Pembelajaran*", (2006) Disampaikan dalam Pelatihan Metodologi Penelitian untuk Peningkatan Kualitas Pembelajaran dan Penelitian Tindakan Kelas bagi Dosen LPTK se-Indonesia.

Sriwahyuni, N. A. (2016). Pengembangan Media Pembelajaran Game Edukasi pada Mata Pelajaran Ekonomi kelas X IIS SMA Laboratorium Universitas Negeri Malang. *Journal*. 9(2), 133– 142.

Woodil, G. 2011. *The MobileLearning Edge*. New York: Mc-Graw Hill.