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Development of Letshoot Applications as an Instructional Media of Computer Network Troubleshooting

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Abstract:

Based on the preliminary research, it is known that many students are having trouble to understand computer network troubleshooting lessons because of the learning materials are delivered through the presentation media in one direction and the absence of learning media that can help students learn independently.This makes students less understand the material presented by the teacher. Based on the background of the problem, we propose to build an android based learning media that can help students learn independently, this application is called Letshoot. Letshoot were made as an instructional media of computer network troubleshooting that can help students learn independently without being hindered by place, time and teacher attendance. This research aims to develop and measure the feasibility level of Letshoot application. This app will help student to learn computer network troubleshooting. Using Borg and Gall's research and development model with the application developed in five stages: (1) data collection, (2) planning, (3) develop the preliminary form of product, (4) preliminary field testing, and (5) main product revision. The result of feasibility test of Letshoot application measured by using Likertscale from expert media get percentage 90,64% which belongs in very feasible category, from expert material equal to 82% which belongs very feasible category and from user equal to 82,11% which belongs to very feasible category to be used as a medium of learning. On these results can be concluded that the Letshoot application very feasible to use as a learning media of computer network troubleshooting in vocational high school.

Keywords : instructional media, android, computer network troubleshooting

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Introduction

The rapid development of information and communication technology has influenced many areas of life, as well as in education. The development of technology in the field of education encourages the creation of product innovations that are useful for learning. One of the innovative product in learning is instructional media. Media in the learning process is defined as graphic, photographic or electronic tools to process and rearrange visual or verbal information (Kustandi and Sutjipto, 2016). Learning is anything that can bring information and knowledge to the interaction that takes place between teachers and students (Asyhar, 2012). From those studies, it can be concluded that a learning media is a tool used to convey information and knowledge in teaching and learning activities that can help to achieve learning goals.

Based on the preliminary research, many students are having trouble to understand computer network troubleshooting lessons this is proved by the number of students who did not pass when held midterm exam This study is trying to develop applications to provide alternative learning media and hoppely will improve the student motivation and lastly increase the learning outcomes. The presence of this Letshoot is intended as a supplement and complement to network troubleshooting lessons that students can use without being impeded by time, place and teacher attendance.

This study aims to (1) develop android based application that can be used as a learning media,named Letshoot (2) to determine the feasibility level of Letshoot as an instructional media of computer network troubleshooting.

Literature Review

There are several studies related to the development of instructional media. Table 1 shows some studies related to the development of instructional media.

Table 1. Related Studies

Author	Area of Study	Study Result
Wahyu Pujiyono, et al. (2015)	Learning Media Introduction of Plant Species Based on Multimedia	Learning media of plant species introduction developed using Adobe Flash Professional CS6 can increase the interest of children to learn existing plant species.
Christianne Lynette (2013)	Development of Mobile Learning Using Android Platform	This study shows that the students are accept and ready for mobile learning implementation
Kurniawan Teguh Martono, et al (2014)	Implementation of Android Based Mobile Learning Application As a Flexible Learning Media	This study shows that 95% of user from university students enjoy in using the application of mobile learning so it can be concluded that the use of mobile learning application can make the learning process more flexible

This study is trying to implement the same method with the previous study mentioned on Table 1, but with different content of learning material. Furthermore, we focused on network troubleshooting learning material which is based on 2013 national curriculum for a vocational high school.

Methodology

Development Model

To develop the app, we follows Research and Development model design by Borg and Gall (1989:775) which consist 5 phases as we can see at Figure 1 and Table 2 for the detail of phases.

Table 2. Borg and Gall's Phase and Results

Phase	Result
Research and Information Collection	Functional requirements, non-functional requirements and learning material used for instructional media
Planning	Navigation map and storyboard
Develop Preliminary Form of Product	User interface design, The program code description, learning media apps with .apk file extension , feasibility instrument, Feasibility Assessment by Media Expert and Material Expert.
Preliminary Field Testing	Feasiblity Assesment by Users
Main Product Revision	Recovering failure

Feasibility Test

Feasibility test of letshoot using learning media assessment criteria from Walker and Hess(1984:206). The criteria based on the quality of content and objectives, quality of learning and technical quality. The quality of content and objectives includes accuracy, importance, completeness, balance, interest or attention, and conformity to the student situation. Learning quality include providing learning opportunities, providing assistance for learning, quality of motivation, learning flexibility, relationships with other learning programs, the quality of social learning interactions. The quality of tests and assessments can impact on students, teachers, and learning. Technical quality aspects include readability, ease of use, display quality, quality of response handling, quality of answer management, and documentation quality.

Participant Test

The feasibility test in this research consists of two stages. The first stage is feasibility testing by 1 media expert and 1 material expert. The second stage is the testing by the user that is 15 students of class XII TKJ SMK Negeri 1 Banyudono. In this research, the technique used to take the sample is simple random sampling technique.

Testing Instruments

Instruments in this study addressed to media experts, material experts and users with different aspects. The instrument used has been valid and has been adapted to the developed application.

Table 3. Media Expert Feasibility Testing Instrument

Aspect	Indicator
Navigation	A. Ease of Navigation B. Accuracy of Navigation
Ease of use	C. Ease of Operation D. Linkage of images/animations with material E. The use of language is easy to understand F. Ease of feedback for students G. Ease of quiz feedback for students
Text	H. Quality of text I. Readability of writing J. The accuracy of letter size K. The accuracy of letter color L. Accuracy of typeface
Display	M. Conformity of display N. Clarity of menu layout O. Clarity of drawing/animation layout P. The accuracy of the use of themes Q. Content placement R. Quality of display design S. Suitability of writing color and background

Table 4. Material Expert Feasibility Testing Instrument

Aspect	Indicator
Learning	A. Conformity of material with core competencies and basic competencies B. Clarity of study instructions C. Awarding examples in the presentation of the material D. Giving practice questions
Material	E. The Material truth F. The Novelty of material G. The attraction of material H. The Depth of material I. The Coherent material J. The ease of material to be understood K. The Evaluation L. The Feedback M. The accuracy of language use N. Ease of students understand the language

Table 5. Users Feasibility Testing Instrument

Aspect	Indicator
Easiness	A. Ease of use B. Ease in understanding the material
Interesting	C. Quality of display D. The attraction
Usefulness	E. Help students to learn F. Positive impact for students G. Increase student skills
Motivation	H. Attention I. Interest

The data of feasibility test results by media experts, material experts and users in this study were measured using Likert scale and then converted into percentage values with the following formula:

$$\text{Percentage } (\%) = \frac{F}{B}\ x\ 100$$

Explanation :

F : Value obtained

B : Total Value

The feasibilty assessment criteria by Riduwan (2012:15) can be seen in Table 6.

Table 6. Feasibility assessment criteria

Assessment Criteria	Percentage
Very feasible	81% - 100%
Feasible	61% - 80%
Less feasible	41% - 60%
Not feasible	21% - 40%
Very infeasible	0% - 20%

Findings and Result

Applications that have been developed then was assessed worthiness by experts of media, materials and users by using the test instrument in the form of questionnaire. The result of the feasibility assessment by the expert of media obtained a percentage score of 90%, from navigation aspect is categorized well. Then, the aspect of ease of use is 88% with a very worthy category, aspect of writing is 96% with a very feasible category and display aspects is 88.57% with a very feasible category so that brings the final percentage of

90.64%. Thus, the eligibility categories of the application on the whole aspect from media experts got category “very feasible”. For detail result, we can see at Table 7.

From the results data of feasibility tests by media experts obtained the lowest valuation of the overall aspect is ease of use aspects. The factor that causes the low value of eligibility on the ease of use aspect is users are confused when operating the application. Therefore, it requires the usage instructions to facilitate the user while operating the application.

Table 7. Results of Feasibility Assessment by Media Experts

Item	Aspect	Percentage score	Feasibility Criteria
1.	Navigation	90%	Very Feasible
2.	Ease of use	88%	Very Feasible
3.	Writing	96%	Very Feasible
4.	Display	88,57%	Very Feasible
	Total value	**90,64%**	Very Feasible

The results of feasibility assessment by material experts from the aspect of learning acquired 80% which is included in the feasible category, and on aspects of the material amounted to 84% with a very feasible category until the end of his percentage was obtained by 82%. Thus, the eligibility categories of the application on the whole aspect from material experts got category "very feasible " can be seen in Table 8.

From the results data of feasibility tests by material experts obtained the lowest valuation of the overall aspect is learning aspects. The factor that causes the low value of eligibility on the learning aspect is the lack of giving examples in the presentation of the material in the form of animation/video related to problems of computer networking in everyday life and how to overcome it.

Table 8. Feasibility Assessment Results by Material Experts

Item	Aspect	Percentage score	Feasibility Criteria
1.	Learning	80%	Feasible
2.	Material	84%	Very Feasible
	Total value	**82%**	Very Feasible

The assessment that was conducted by the user includes several aspects, namely the aspects of easiness, attractiveness, usefullness, and motivation. From the assessment of the aspects was obtained score percentage of 82.4% of the easiness aspect with very feasible category, attractiveness aspects of 83.6% with a very feasible category, usefulness aspects of 80.44% with a feasible category, and motivational aspects of 82% with a very feasible category, so it brings the final percentage of 82.11%. Based on the assessment that was conducted by users, Letshoot is categorized "very feasible", it is used as a complementary learning media on subjects of Computer Network Troubleshooting. The feasibility Assessment Result by users can be seen in Table 9.

Table 9. Feasibility Assessment Results by User

Item	Aspect	Percentage score	Feasibility Criteria
1.	Easiness	82,4%	Very Feasible
2.	Attractiveness	83,6%	Very Feasible
3.	Usefulness	80,44%	Feasible
4.	Motivation	82%	Very Feasible
	Total Value	**82,11%**	Very Feasible

Conclusion

Based on the results of research and discussion on the development of Letshoot can be drawn conclusion as follows :

1. The feasibility test result of letshoot obatined the percentage of 90.64% from media experts, from material experts is 82% and from users is 82.11%. From the test results can be conclude that Letshoot application that has been developed included in the category of “very feasible”, it is used as a complementary learning media on subjects of Computer Network Troubleshooting.
2. Based on the analysis of the feasibility test results, the learning aspect get the lowest assessment of other aspects due to lack of giving examples in the presentation of the material.

Future Works

Suggestions that can be given for this research are as follows:

1. The application can be developed to use the material content dynamically (teacher can add or reduce the content)
2. It is required the addition of examples from presentation of the material in the form of animation/video related to computer network troubleshooting in everyday life.
3. It is required the addition of usage instruction to facilitate the user while operating the application.

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