Mobile Learning Media for Enhanced Motivation in Audio and Video Processing: A Vocational Multimedia Approach

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Article Info	ABSTRACT

The rapid development of technology and information has caused some human activities to be replaced by technology. Based on the results of observations and initial observations made at SMKN 1 Pasuruan, at SMK PGRI 8 Malang, and at SMKN 3 Kota Bima, a problem was found, namely difficulties in understanding the material in the subject of Audio and Video Processing Engineering because the media was lacking. The objectives of the research activities were to develop mobile-based learning media, describe learning media, analyze the feasibility of learning media, and describe the level of student learning motivation. The developed learning media is stored in .apk format so that it can be operated on a smartphone. The learning media development model adapts the Plomp development model, consisting of an initial investigation or preliminary research phase, a development or prototyping phase, and an assessment phase. In the initial investigation phase or preliminary research, analyze the learning of audio and video processing techniques and find a problem. Then, in the development or prototype phase, there were validation results from media experts of 91.31% and results from material experts of 93.3%. Finally, in the testing phase of the field test on 26 students, the results were 86.71%, and the measurement of learning motivation was 82.85%. Referring to the results of the research, the implementation of the mobile-based learning media that was developed is very feasible to be applied in the learning process. It is quite efficient and effective in increasing student learning motivation.

I. INTRODUCTION

Education is one of the best tools that will shape the next generation of the nation in the future. Education can be interpreted as a process of changing the attitudes and behavior of a person or group through teaching and training. In education, there is a process of interaction between teachers and students called the learning process. In the learning process, the availability of teaching materials is necessary to facilitate educators in conveying lessons, while teaching materials are learning resources that students must study. [1]. Several teaching materials can be found, both printed and electronic, including the Electronic School Book. On average, educators still use learning resources available on the market, even though the contents are not necessarily to the conditions, school potential, and student characteristics. In this case, educators have a very important role in determining the right learning resources for their students. In the learning process, the teacher has important roles, tasks, and functions to convey material to students, so the teacher will need a learning media to convey the material so that it can be conveyed properly. [2], [3].

Based on the results of observations and observations made at SMK so far, the learning resources used by students are in the form of PDFs prepared by the teacher. However, the material's presentation was considered ineffective enough to be accepted by students. This causes student learning motivation to decrease, which will affect learning outcomes. Thus, this requires teaching materials that are not only from the material but from an interactive display so that in the learning process, students are motivated and not bored [4], [5], for example, by providing interesting pictures and video tutorials that are relevant to learning objectives. Design can increase student motivation when students feel unburdened during learning [6].

The rapid development of technology and information has caused some human activities to be replaced by technology.

With many features and easier access to games via the internet using smartphones, smartphones not only function as a means of communication but are also used as a means of playing and social media. This will impact student learning because their concentration will be split between social media and learning. To avoid these things, smartphones should be used as good learning media so that students can use smartphones as well as possible. Supposedly, this technological advancement can be utilized in the learning process. [7]. Teachers can use the development of technology and information to create unique and interesting learning media for students. The use of learning media can help teachers convey information easily. Media use in the learning process can help limit educators' ability to convey information, and there are limitations to class hours. [8]. The advantages of this mobile-based learning media are the ability to access learning materials instantly, learn interactively and adaptively, and the learning process becomes more effective and efficient by the demands of the 2013 curriculum.

II. METHODS

The model that will be carried out in this research and development refers to the model put forward by Plomp in 2013. There are 3 phases in the development of this plump model, namely the preliminary research phase, the development or prototyping phase, and the testing phase.

1) The initial investigative phase or preliminary research (preliminary research), in this phase is problem identification and needs analysis in the form of (a) Student analysis, which aims to identify problems experienced by students in the learning process takes place along with identifying student needs; (b) Material analysis, which aims to identify the material being taught and the curriculum reference used by the school; (c) Infrastructure analysis, which aims to identify the learning supports provided by schools; (d) Media analysis, which aims to identify the specifications of the media to be developed and to suit the needs of students.

2) The development or prototyping phase is to process data from the results of the initial investigation phase into the learning media to be developed. In this phase, the activities carried out are (a) Designing learning materials, namely determining the basic competencies used according to the 2013 curriculum; (2) Flowchart design; (c) drafting designs or storyboards; (4) Development of learning media or products. There are several processes at this stage, namely flowchart and storyboard design. The interface design is made using a website called Figma. Meanwhile, to build the application, use the Kodular website, which will be exported to Android or .apk format, and (5) Test learning media or products. In this phase, what is being done is validation by material experts and media experts. Learning media resulting from media development will be validated by material and media experts, and input from the validator will be used as a basis for improvement. This process aims to make the product appropriate or valid for the next.

3) The testing phase (assessment phase), after conducting material expert trials and media expert trials in the prototype phase, they enter the testing phase. At this stage, field or extensive tests will be carried out where the object is SMK students. This process is done based on the effective product developed. The test instrument will measure students' abilities after being given learning products or media. The implementation results will be measured to determine whether or not the learning media developed is feasible.

The types of data used in this development research are quantitative and qualitative. Quantitative data is data obtained through filling out questionnaires by trial subjects, namely material experts and media experts, as well as user test questionnaires. At the same time, the qualitative data were obtained from the results of interviews, analysis of needs, and delivery of criticism, suggestions, and input given by experts and media users. Observation and interview data were collected during the learning process at SMKN 1 Pasuruan, SMK PGRI 8 Malang, and interview data were collected with teachers at SMKN 1 Pasuruan, SMKN 3 Kota Bima. After that, a questionnaire instrument regarding the developed learning media was distributed to material experts, media experts, and class XII students majoring in multimedia. Data in the questionnaire was collected from the results of descriptive statistical tests and then analyzed to determine the research conclusions. The data obtained will then be converted into a percentage. The product being developed will be validated to reach a level greater than the percentage of 61%. Then, the media will be classified as having a proper qualification, which means the media is quite suitable for use.

III. RESULT AND DISCUSSION

Learning media products are developed using the Plomp model development method. The development procedure refers to the Plomp model, which is divided into 3 phases, namely the initial investigation phase, the development or prototype phase, and the testing phase. [9]. The following are the results of each stage of development using the Plomp model in the learning media development process.

1) The initial investigation or preliminary research phase. The first is Student Analysis. The results of an interview with one of the teachers in the Audio and Video Processing Engineering subject contained several points, namely: (1) Students had difficulty learning about audio and video processing, causing students' learning motivation to decrease which would affect learning outcomes; (2) The learning resources used by students still use pdf, e-learning, internet, and printed books; (3) Almost all students have smartphones and some have laptops and educators give permission to students to use smartphones during learning; and (4) learning media that can help students to increase learning motivation. Like mobile-based learning.

Second, namely Material Analysis, Observations for material analysis, and observations of the school's curriculum, namely SMKN 3 Kota Bima, the school uses the 2013 Revised 2018 curriculum. Then furthermore, in the development of learning media, three basic competencies (KD), namely basic competencies 3.1 to 3.3, contain material for understanding the flow of multimedia production processes, applying video camera operating procedures, and analyzing camera

movement techniques when shooting moving images (video recording).

The third is Learning Support Analysis, which is an observation for learning support, namely where schools still provide access to smartphones as a learning tool to add knowledge or information from the internet or e-books. The field observations of students and teachers found that the teaching materials used were still printed books and PDFs.

Finally, in the initial investigative phase, namely Media Analysis, the media developed is media using the smartphone platform, using the Android operating system so that students can access learning media from anywhere and unlimited time. The learning media to be developed can be run using the Android operating system with a minimum of Android 5.0 or Android Lollipop. Then, using 2 GB of RAM. The purpose of developing this media is to gain additional information or knowledge in the learning process of Audio and Video Processing Techniques.

2) The development or prototyping phase. This learning media is based on the Android operating system called TPAV, namely Audio and Video Processing Technology. The TPAV application has several main menus in Figure 1, such as the Learning Materials in Figure 2, where the contents are in the form of several learning materials. Each KD has three menus and contains learning materials and videos. In the Learning Exercises menu in Figure 3, the contents are in the form of exercises for students to practice, and there is a link button to collect completed exercises; the Case Study menu in Figure 4

where the contents are in the form of problems that must be solved and there is a link button to collect the results of problems that have been solved, the Learning Evaluation menu in Figure 5 where the contents are in the form of multiple choice questions with a total of 15 questions individually random. The TPAV application also contains information in the form of learning objectives, KD, and application development, as shown in Figure 5.

After the prototype has been made, it will be validated by the supervisor first, and then it will be validated by the media expert and material expert. This section discusses the results of product trials or learning media, namely (1) Media Experts and (2) Material Experts. The validation criteria for learning media include Software Engineering, Content Quality, Presentation Design, Interaction Usability, and Accessibility. The percentage of the feasibility of mobile-based learning media for Audio and Video Processing Techniques from several aspects belongs to the Fairly Valid category, which ranges from 61-80%. In this case, the average data is valid enough, but it can still be maximized to be better. Media experts examine the Presentation Design aspect in the lowest category, which is Less Valid. Therefore, improvements must be made so that the media reaches the category that meets the minimum standards, namely between 61% -80%. The feasibility level of research and development products is identical to the score; the greater the percentage of results obtained, the better the feasibility level of learning media. [10].

Fig. 1. Main Menu   Fig. 2. Learning Material Menu   Fig. 3. Learning Exercise Menu

Fig. 4.   Menu Case Study
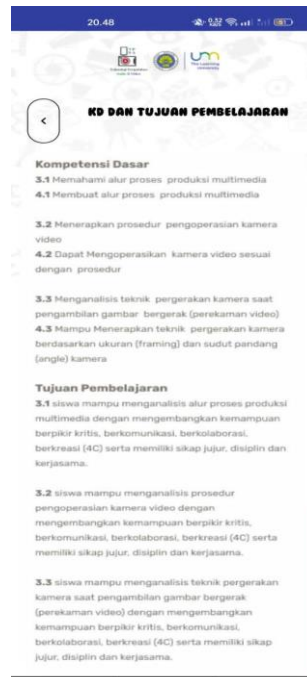
Fig. 5.   Learning Evaluation Menu

Fig. 6.   Information Menu

TABLE I.   MEDIA VALIDATION RESULTS IN DATA BEFORE REVISION

No	Assessment Aspects	$\sum$Tse	$\sum$Tsh	P (%)	Category
1.	Software engineering	25	35	71.43	Valid Enough
2.	Content Quality	27	35	77.14	Valid Enough
3.	Presentation Design	13	25	52	Invalid
4.	Interaction Usability	10	15	66.67	Valid Enough
5.	Accessibility	12	15	80	Valid Enough
	Average			69.45	Valid Enough

Furthermore, after revisions, the percentage of the feasibility of mobile-based learning media for Audio and Video Processing Engineering after revising is classified as a very valid category, namely between 81% -100%, with an average value of 91.31%. The content quality aspect gets the 97.14% category; the media must be good, and the material must meet the learning objectives. In line with previous studies that developing teaching materials must be arranged systematically, gradually [11]. An educator can arouse student motivation by making him feel the need for what needs to be learned. [12]The low assessment aspect in Table I improves because the application contains pictures and video tutorials that help students understand the material. The proper media is complete regarding learning materials, examples of material in pictures or video tutorials, etc.

TABLE II.   MEDIA VALIDATION RESULTS IN DATA AFTER REVISION

No	Assessment Aspects	$\sum$Tse	$\sum$Tsh	P (%)	Category
1.	Software engineering	32	35	91.43	Very Valid
2.	Content Quality	34	35	97.14	Very Valid
3.	Presentation Design	22	25	88	Very Valid
4.	Interaction Usability	15	15	100	Very Valid
5.	Accessibility	12	15	80	Valid Enough
	Average			91.31	Very Valid

While the criteria used by material experts are learning design and visual communication, the percentage of the feasibility of mobile-based learning media for the subject of Audio and Video Processing Techniques for material experts is classified as a very valid category, namely between 81% - 100% with an average of 93.3%. The level of validation obtained is classified as a very decent qualification without any improvement. The assessment aspect, namely the learning design aspect, is included in the very valid category with a percentage of 90.5%. This is because the learning media has material that is presented in full. Valid media will have balance and completeness regarding learning materials, learning objectives, and others.

TABLE III.   DATA RESULTS OF MATERIAL EXPERTS' VALIDATION

No	Assessment Aspects	$\sum$Tse	$\sum$Tsh	P (%)	Category
1.	Learning Design	74	80	90.5	Very Valid
2.	Visual Communication	47	50	94	Very Valid
	Average			93.3	Very Valid

3) The testing phase (assessment phase). The first is in the form of Field Trials. This field trial was carried out at SMK Negeri 3 Kota Bima with 26 class XII students who are currently or have taken basic competencies 3.1-3.3, which contains material on understanding the multimedia production process flow, applying video camera operating procedures, and analyzing camera movement techniques when taking moving pictures (video recording). The criteria for the assessment aspect in this field trial are (1) Accessibility, (2) Visual Communication, (3) Learning Design, and (4) Feedback and Motivation.

The percentage of the feasibility of learning media in field trials is between 81% -100%. Regarding the eligibility criteria of learning media, the average user feasibility test results in

field trials is 86.71%, which is a very valid category. In the learning design aspect, it gets a very valid category with a percentage of 82.97%. This is because the material presented in the application is sequential and not confusing. The development of teaching materials is structured into a reference that aims to support student development in achieving goals in learning by the curriculum [13]. One indicator in visual communication is the "navigation icon," which has a percentage of 87.69%, which means the buttons on TPAV are clear and easy to understand and can be operated properly. Designed teaching materials must adapt to the needs of learning and teaching and must be easy to use [14], [15].

TABLE IV.   FIELD TRIAL RESULTS DATA

No	Assessment Aspects	∑Tse	∑Tsh	P (%)	Category
1.	Learning Design	1510	1820	82.97	Very Valid
2.	Visual Communication	1085	1170	92.74	Very Valid
3.	Feedback and Motivation	450	520	86.54	Very Valid
4.	Accessibility	219	260	84.62	Very Valid
	Average			86.71	Very Valid

The second is taking data about student motivation based on the results of measuring learning motivation before using the application; the data shows that 14 students have poor learning motivation, and 12 students have good learning motivation. The 12 students with good learning motivation have a percentage of 46.15%, while the remaining 14 students with low learning motivation have a percentage of 53.85%.

TABLE V.   DATA ON STUDENT LEARNING MOTIVATION RESULTS BEFORE USING THE TPAV APPLICATION

No	Assessment Aspects	∑Tse	∑Tsh	P (%)	Category
1.	Attention	318	650	48.92	Enough Motivation
2.	Relevance	221	390	56.67	Enough Motivation
3.	Confidence	281	520	54.04	Enough Motivation
4.	Satisfaction	503	910	55.27	Enough Motivation
	Average			53.73	Enough Motivation

The average percentage of student motivation ranges between 41% -60%, with a value of 53.73%. In this case, it can be seen from Table V that the data has received sufficient motivation. However, it can still be maximized to be better for the learning process by providing products or applications so that the media used by students can foster better learning motivation. The feasibility level of research and development product results is identical to the score; the greater the percentage of results obtained, the better the feasibility level of learning media [10].

TABLE VI.   DATA ON STUDENT LEARNING MOTIVATION RESULTS AFTER USING THE TPAV APPLICATION

No	Assessment Aspects	∑Tse	∑Tsh	P (%)	Category
1.	Attention	526	650	80.92	High motivation
2.	Relevance	331	390	84.87	Very high motivation
3.	Confidence	428	520	82.31	Very high motivation
4.	Satisfaction	758	910	83.30	Very high motivation
	Average			82.85	Very high motivation

Furthermore, after making revisions, the percentage of learning motivation test results after using the application gets a very high motivation category and has an average percentage value of 82.85%. In this case, it shows that after using the application, the increase in student learning motivation increased by a percentage of 29.12%. The level of validation obtained is classified as a Very High Motivation qualification. Of the four aspects of the assessment, the highest percentage score is for the second aspect of the assessment or Relevance, which has a percentage of 84.87% with a very high motivation category. Student motivation will be maintained if students think the things they are learning are helpful or related to their lives with clear goals. [12]Information and technology-assisted learning media (ICT) can make learning interesting and positively impact academic performance through learning motivation and student learning outcomes. [16]. Therefore, it will keep students motivated to learn.

IV. CONCLUSION

Based on the data obtained from this research and development, the studies that can be concluded are as follows: 1) The resulting learning media products are in the form of mobile-based applications in the subject of Audio and Video Processing Engineering for class XII Multimedia SMKN 3 Kota Bima with the android format or the app extension. This application is included in the category of additional information or tools to increase student learning motivation, not as a substitute for the role of a mentor or teacher. This application can also be used in the ongoing learning process or independently by students, which is useful for adding to students' understanding of the subject matter. 2) This mobile-based learning media product has been designed according to user needs and successfully developed and applied in learning audio and video processing techniques. This research and development were carried out using the plump development method, which has 3 phases, namely: (a) the initial investigation phase or preliminary research; (b) The development or prototyping phase; and (c) the testing phase (assessment phase). 3) Media experts, material experts, and field trials have validated this mobile-based learning media product. The learning media testing phase is: (a) media expert validation obtains a feasibility percentage of 91.31% with a very valid category; (b) subject matter expert validation gets a feasibility percentage of 93.3% with a very valid category, and (3) field trials get a feasibility percentage value of 86.70% with a very valid category. 4) This mobile-based learning media product can increase student learning motivation by getting a percentage of 29.12%.

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