The Learning Media Development In The Form Of Project Based Multimedia For Fashion Design Course

by Dina Ampera Baharuddin

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Abstract: The demands of the 4.0 industrial revolutions and challenge to face the z generation make the recent learning must be integrated with the information technology and oriented by the student. Generally, the aim of this study is to produce the project-based leaning media in the form of multimedia on the clothing design courses program of fashion at Medan State University. To create a learning media which is in accordance with the needs, valid, and effective, in detail this study is aimed at: (1) identifying the needed learning media for clothing design course; (2) testing the learning media validity which was developed; (3) checking the effectiveness of developed learning media. This study was adopted by a development model from Borg & Gall which was guided by a learning design model from Dick & Carey. This study consists of two stages; those are the development stage and the product effectiveness check stage. The trial subject consists of two material experts, two instructional design experts, and two media experts, 3 college students for the small trial, 9 college students for the medium group trial, 30 college students for a field trial, and 70 college students for an effectiveness trial. The data was collected through questionnaires, interviews, expert test sheets, and tests. The collected data was then analyzed qualitatively and quantitatively. Result of this study shows that: (1) the needed learning media is a project-based media in the form of multimedia which is effective and interesting to be used in a class learning or as an interactive independent learning media by college students outside the class; (2) the validity test result shows that media which was developed is included as the "very decent" category to use, and (3) the effectiveness test result using the one-party t-test got the price of t-count = 13,360 and t-table = 2,00. If it is compared so that $t_{calculate} > t_{table}$ or $13,360 > 2,00$ so that the alternative hypothesis (Ha) accepted can be known that there is an average difference or the whole study result which consists of the cognitive aspect, psychomotor, and affective which is used the project-based learning media. It can be concluded that the effectiveness of media usage is 77,54% meanwhile the graphic is 63,09%.

Keywords: learning media, fashion design, multimedia, project-based learning.

I. INTRODUCTION

Industrial Revolution 4.0 has a big impact on the world of education. One of them is the demand to use information technology and the internet in the learning process or what is called a smart classroom (Shahroom & Hussin, 2018). So that teachers and students must be ready to learn to use the latest information technology in the teaching and learning process because the success of the implementation of technology-based learning depends on the ability of teachers and students to apply the technology used. (Basak, Wotto, & Be´langer, 2018). When viewed from the perspective of students, most students are very ready with information technology and the internet, considering that most of them are generation Z, known as digital natives who were born in 1995 and above. The characteristics of this generation are that they cannot be separated from the internet and smartphones and are impatient, wanting everything instantly (Rue, 2018). Meanwhile, from the lecturer's side, it is still classified as a digital immigrant, who must adapt to the ever-evolving information technology.

Empirically, the integration of information technology into the learning process has been shown to have many positive impacts. By utilizing information technology learning will become more dynamic and be able to increase the interaction of students and teachers (Almara'beh, Amer, & Sulieman, 2015). In fact, the use of information technology is also able to increase interaction between students, so that student-centered learning can be realized (Sakat, Zin, Muhamad, & Ahmad, 2012). The use of information technology also helps maintain student concentration on the material delivered in a long time compared to the use of traditional learning media (Liu, 2012). Another advantage of implementing information technology in learning is that it is efficient in terms of time and cost because digital technology-based learning media do not require printing costs and can be learned anytime and anywhere by students (Turan & Goktas, 2016). Furthermore, the use of information technology in learning is able to make learning more interesting, increase student motivation and learning enthusiasm which leads to improved learning achievement (Kadaruddin, 2017).

Despite the very clear demands of the industrial revolution era 4.0 and z generation, as well as the benefits of using empirical information technology, learning about fashion design at Medan State University still uses print media (books, modules, and other teaching materials). The media used by lecturers are only in the form of images on whiteboards and handouts while the learning process is still centered on lecturers. Students are always conditioned to accept information as it is so that they become passive and wait to be given information without trying to find that information, this causes an unattractive and communicative learning atmosphere so students are less motivated to learn and difficult to understand every step in fashion design material. This makes students less interested and less motivated to learn. Thus, student learning outcomes have not reached the expected competence.

Considering the problems of learning media and the learning process that are still centered on lecturers, this research is aimed at developing project-based multimedia learning media for fashion design courses at Medan State University. In this study, what is meant by multimedia is the presentation of information in the form of text, images and sound together (integrated) so that it becomes more effective and efficient (Handoyo, 2003; Dalle et al., 2017; Baharuddin et al., 2018; Dalle & Mutalib, 2018; Derlina et al., 2018). Learning media in the form of multimedia will stimulate the human sense and it will greatly affect the learning outcomes as revealed by Munir (2008) which states that approximately 90% of someone's learning outcomes are obtained through the sense of hearing. Meanwhile, the rest 5% is through the other senses.

Whereas, what is meant by project-based is the implementation of learning strategies that use projects or activities as media; so students will explore, evaluate, interpret, synthesize, and information to produce various forms of learning outcomes. The implementation of project-based learning will give students the opportunity to think critically and be able to develop their creativity and actively manage their learning by working in a real way that produces real products. Project-Based Learning can reduce competition and lead students to be more collaborative than to work alone. Thus, project-based learning is very effective for students who have field-dependent learning styles (Chen, 2004). In addition, Project Based Learning can be done independently through working to construct learning through new knowledge and skills, and realize it intangible products. Empirically, the application of project-based learning has been proven to increase learning motivation and the ability to solve problems (Ahmad & Ahmad, 2019; Chiang & Lee, 2016). Things that make project-based learning successful include the use of the latest technology, quality group work, the ability of teachers to help, encourage, and provide direction to students, the balance between providing in-depth explanations and appropriateness of assessment (Kokotsaki, Menzies, & Wiggins, 2016).

Based on the explanation above, the objectives of this research in detail are (1) identifying the learning media needed for fashion design courses; (2) test the validity of the developed learning media; and (3)

test the effectiveness of the learning media developed. It is hoped that the learning media in the form of project-based multimedia can increase student motivation and learning achievement in fashion design courses.

II.   RESEARCH METHODS

This research was carried out at the Medan State University Fashion Design study program. The development model used is the Borg & Gall development model (2005) combined with learning models Dick & Carrey (2005). The development strategy used is an adaptation of Luther's multimedia development strategy and the learning development strategy of the Pekerti program version (the development of basic instructional engineering skills) in 2001, which is an effort to improve the quality of learning in the higher education environment.

Stages of this development are: (1) preliminary research, this stage begins with identifying needs and determining competency standards, conducting learning analysis, identifying student characteristics and behavior, determining basic competencies and indicators, writing benchmark reference tests, developing learning materials, (2) the second stage of collecting material, begins with the collection of materials, the making and collection of recording animation images and the collection of recording animation images and audio collection, (3) the third stage of making media design, the second stage begins with making software design, making scripts, making storyboards, making flowchart view, (4) the fourth stage is making and producing learning media, which is equipped with media guidelines such as: learning instructions, brief descriptions, basic competencies, material descriptions, practice questions and feedback, the last closing is a summary , (5) the fifth stage is review at au field test in the context of formative evaluation and product revision. Formative evaluation continues to develop during the development process starting from the analysis, design, production, and implementation of the product.

Stages of trial, namely: validation of material experts, validation of media experts, validation of instructional design experts, conceptual analysis, development revision (stage I) based on an assessment in the form of input, criticism, and suggestions from 2 material experts, 2 media experts, and 2 experts instructional design for improvement. Student testing (small group). The assessment of this program is based on a questionnaire completed by 3 lecturers and 9 students (small group trial).

The product trial data is used to determine the feasibility, effectiveness, and attractiveness of the product before it is used in the field. The types of data that will be extracted are as follows: (1) aspects of learning and the truth of the contents are obtained from the material experts, and the learning design; (2) media and learning designs are obtained from media experts; (3) the quality of the display and presentation of the material, obtained from individual trials, small groups, and the field and (4) the attractiveness of multimedia learning media is obtained from the activities and responses of students during the learning media trial. The data analysis of this research used quantitative descriptive analysis, the collected data was analyzed with quantitative descriptive statistical techniques. Multimedia assessment criteria will be converted to a value with a scale of five using a Likert scale that is analyzed descriptively in percentage.

Conducting experimental research with a "Posttest-Only Control Design" design. In this design there are two groups, each randomly selected. The first group was given treatment (X) and the other group was not. The treated group is called the experimental group and the untreated group and only the measurement is called the control group.

This research was conducted in the even semester of 2014/2015 with a sample of 70 students, with a

sample consisting of two classes namely the experimental class who were taught learning using multimedia learning media and the control class being taught using graphic media. To get the final results, tests were given to both classes with the same instrument, namely psychomotor tests, affective and cognitive tests.

The test is a test of learning outcomes arranged based on the competence of the coloring material and image completion. The test to find out the learning outcomes of the material describes the proportions of the body based on the framework and attitudes, as well as describing how to draw simple clothing done by posttest, which is given after students use the learning media.

Aspects assessed in the learning outcomes test include the positive and psychomotor domains. Ryan (1990) explained that the results of learning skills can be measured through (1) direct observation and assessment of behavior during the learning process practice takes place, (2) after participating in learning, namely by providing tests to measure skills and attitudes, (3) sometime after learning is complete and later in the work environment. Meanwhile, Leighbody (1998) argues that the assessment of psychomotor learning outcomes includes (1) the ability to use tools and work attitudes, (2) the ability to analyze a job and arrange the sequence of work, (3) the speed of doing tasks, (4) the ability to read pictures and symbols, (5) compatibility with the expected shape and or size. From the above explanation, it can be summarized that in the assessment of psychomotor learning outcomes or skills must include product preparation, process, and results.

III. RESEARCH RESULTS

Development Stage

Broadly speaking, the development phase includes analysis of needs, design, development, and validity testing. The following is an explanation of the results of each of these stages:

Needs Analysis

The process of media development is carried out in stages, namely the initial process of media development starts from conducting a needs analysis by distributing questionnaires to 10 lecturers and 30 students, which begins by describing the definition of project-based learning media in multimedia with Adobe Flash CS6 Software so that respondents have an idea of questions in the questionnaire submitted. Search results from the questionnaire found 75% of the lecturers said they needed learning media so that the learning process ran effectively and 100% of students said they needed learning media to be used as an individual learning tool. Based on the results of the needs analysis it can be concluded that the development of media conceptualized in multimedia during the learning process is very much needed. From the results of oral interviews and instrument filling to lecturers, the media that have been used are graphic or hand out media but are less desirable, therefore productive lecturers state they really need media that is conceptualized in the form of multimedia in order to realize a more effective learning process.

Design and Develop

Some series of development processes have been carried out, so the next step is to design and develop learning media with Adobe Flash CS6 Software. The initial product being developed is in the form of an overview of fashion design learning which outlines the following :

1) Material

The material presented in this media is fashion design material which is a learning support material that contains explanatory material. Learning media are competencies (1) Explain how to draw body proportions based on the frame, (2) Make drawings of body proportions based on frame, (3) Explain how to make sketches of blouse/shirt clothing (4) Make sketches of blouse/shirt clothing.

2) Presentation Component

The components of presentation in this media are as follows :

a. Instructions explain the systematic use of instructional media.

b. Competencies include competency standards, basic competencies, and indicators of achievement in each subject matter

c. The main menu consisting of navigation buttons, animation, text, material explanation, sound and images. Each of them is explained sequentially with visualization and video. As a source/reference used, complete with bibliography. There is a summary as a conclusion of the material presented and also completed with an evaluation.

Test the Validity of Learning Media

Based on product evaluation through a series of trials and revisions that have been carried out, this media is declared valid. The trial was conducted with six stages, namely: (1) validation of material experts, (2) validation of learning design experts, (3) validation of instructional media experts, (4) individual trials, (5) small group trials, and (6) limited field trials.

Material expert data on project-based media development in Clothing Design subjects was conducted by a lecturer majoring in Clothing at Medan State University. The assessment is conducted to obtain information that will be used to improve the quality of the media in the subject of Clothing Design class XI.

Validation is carried out by a team of experts by evaluating the aspects of the contents of the material, aspects of the program and project material given to each basic competency which includes: (1) explain how to draw body proportions based on the framework; (2) draw a picture of body proportions based on the framework; (3) explains how to make a sketch of a blouse/shirt fashion; and (4) draw a sketch of a blouse/shirt fashion. Based on the material aspects, the programming aspects and the project aspects on material 1 are on average in the feasible criteria (89.16%). In material 2 the assessment of the validation expert has a decent average (90%).

The validation of the product is intended to know the instructional design expert's opinion on the development of project-based media and this validation was carried out by the Postgraduate Lecturer in Education Technology Study Program, Medan State University. Information obtained for evaluating the feasibility of fashion design media is about the appropriateness of the content, information design, graphic interaction, and audio. Validation from instructional design experts has five eligibility criteria on average eligibility criteria (88.8%).

Validation of the product is intended to find out the opinions of Learning Media experts about the design of the developed media. The results of the validation from the media experts are having an average of very decent criteria (83.10%).

Individual trials on 5 students were conducted with the aim of identifying product deficiencies and responses to products that had been developed. The evaluation of this trial is about the perception of the product that has been developed. Assessment includes aspects of learning, material aspects, aspects of programming and aspects of the multimedia display. Data from individual trial evaluation results indicate that the majority of assessments within the criteria are very feasible (89.05%)

A small group trial was conducted on 9 students with low, medium, and smart abilities. This small group trial data is intended to determine student perceptions of learning media that have been developed and have been revised from weaknesses that appear after individual trials. The results of the fashion design learning media assessment show that the media developed at this stage are included in the very feasible criteria. Based on the data obtained, it can be concluded that there is no need to revise it again, so that it can proceed to the next trial phase, namely limited field trials.

Field trials consisting of 30 students produce data that is used to find out how the benefits of the product for the wearer. The results of student responses to the assessment media products in the criteria are very feasible, namely a score of 1,534 with a percentage of 87.40%.

The results of expert tests by material experts, instructional design experts and media experts in each aspect of the overall assessment are determined by the average score in their respective categories. Analysis from the material experts for the media has a percentage assessment on aspects of content, aspects of programming and aspects of the project with an average score of material 1 (89.16%), material 2 (90%), materials 3 and 4 each have an average score (99.58%) and (98.33%). This means that the developed media can meet the demands of learning needs.
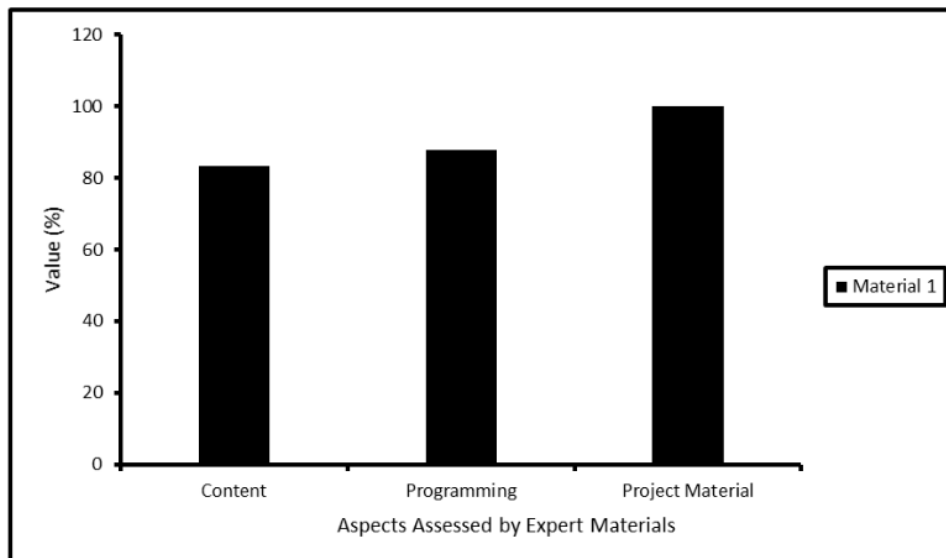

Figure 1. Acquisition of Learning Media Scores by Material Experts on Handout 1

Analysis from the material expert for the media has a percentage of assessment in material 1 covering the content aspect (83.3%), the programming aspect (87.7%) and the project aspect (100%), as seen in Figure 1.
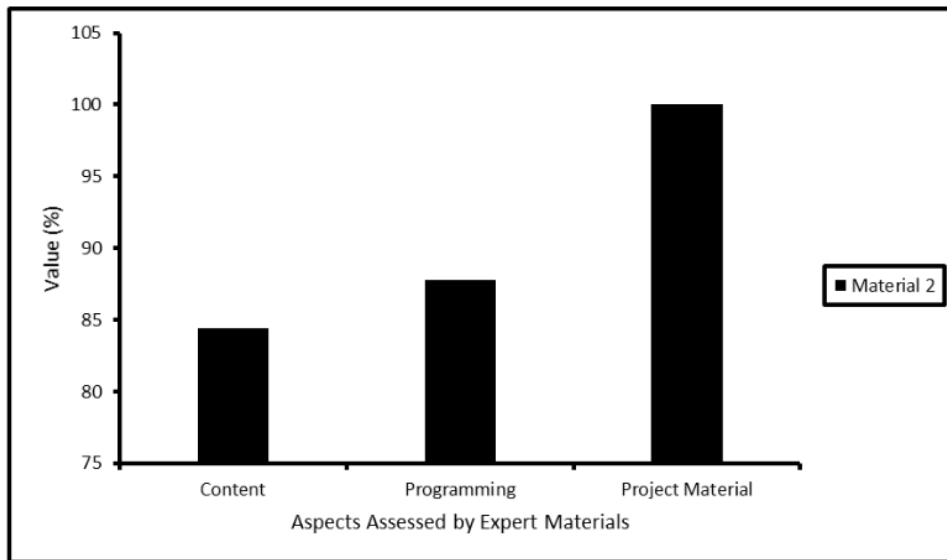
Figure 2. Acquisition of Learning Media Scores by Material Experts on Handout 2

The analysis of the material experts for the project-based learning media developed has a percentage assessment on material 2 covering the content aspect (84.4%), the programming aspect (87.7%) and the project aspect (100%), as shown in Figure 2
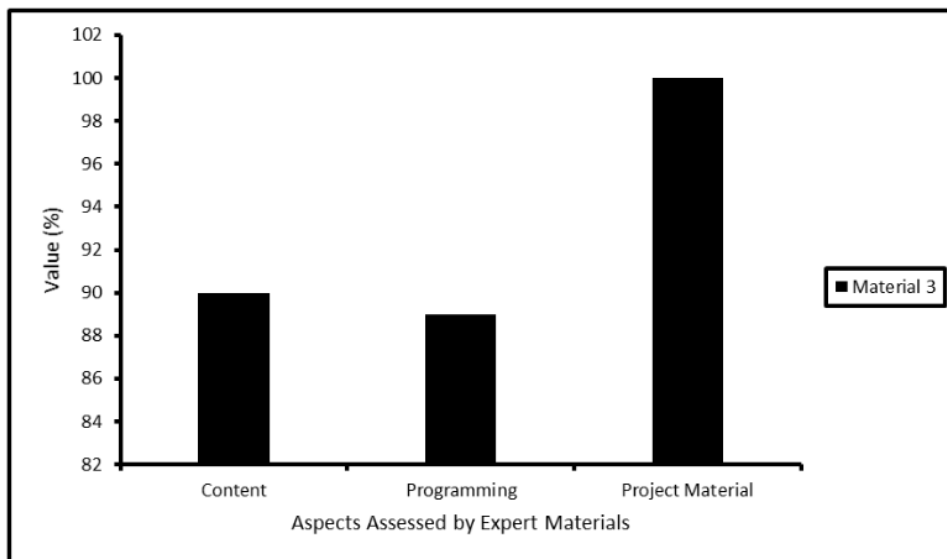

Figure 3. Acquisition of Learning Media Scores by Material Expert in Material 3

Analysis from the material expert for the project-based learning media developed has a percentage of assessment in material 3 covering the content aspect (90%), the programming aspect (89%) and the project aspect (100%)
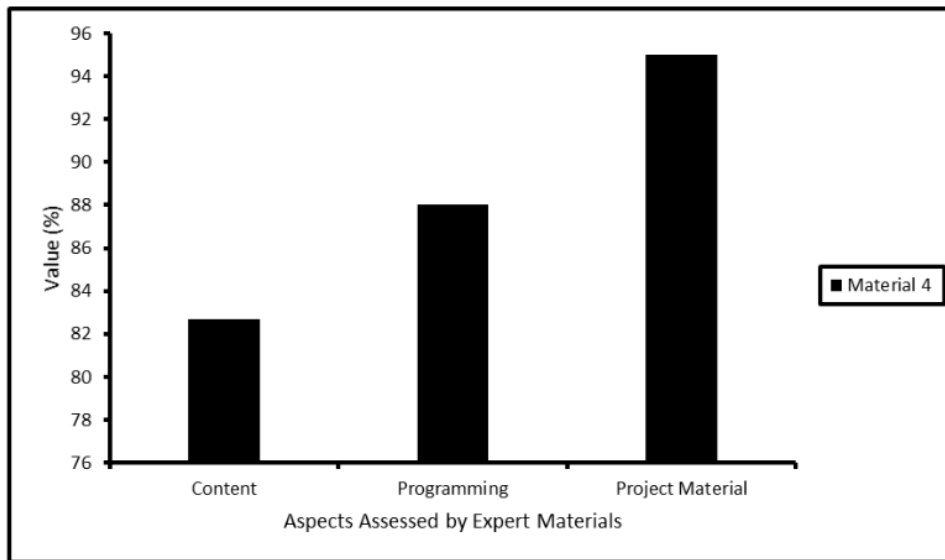
Figure 4. Acquisition of Learning Media Scores by Material Experts on Material 4

Analysis from material experts for the developed media has a percentage of assessment on material 4 covering aspects of content (82.7%), programming aspects (88%) and project aspects (95%). The results of the expert material assessment of the compiled media showed an overall percentage with an average of 89.60% included in the category of "Very Eligible" which meant that the project-based learning media conceptualized in multimedia using Adobe Flash CS6 Software could be said to be very good in the aspect of content material, programming aspects, and project material aspects on each learning material that is in the media. Based on the responses of material experts, it was stated that this media was suitable for field trials with revisions in accordance with the suggestions put forward and generally accepted.

Instructional design experts assess the developed Fashion Design learning media already has feasibility with a percentage of assessment on the feasibility aspects of the presentation with an average score of 88.8%. This means that the media that have been developed can meet the demands of learning needs seen from the indicators of eligibility assessment, presentation, graphic.
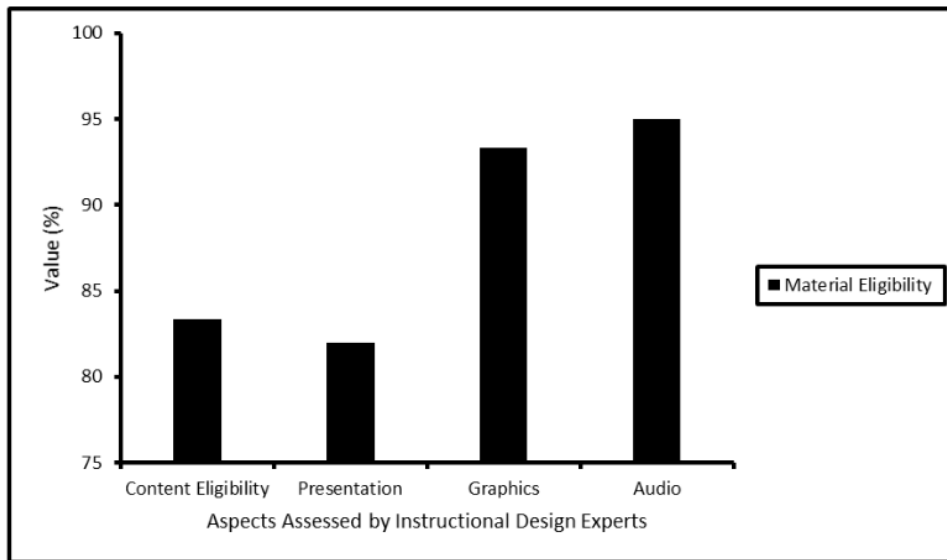
Figure 5. Learning Media Score Acquired by Instructional Design Experts

From figure 5 above, it can be seen that the results of the instructional design expert's assessment of the compiled media show an average percentage of 88.8% including the very feasible category. Based on the response of the learning design expert, it was stated that the project-based learning media packaged in multimedia was suitable for field trials with revisions in accordance with the suggestions put forward and generally accepted.

The instructional media experts developed already have feasibility with a percentage of assessment that is an average score of 83.10%. In addition, the feasibility of the media can be seen from the percentage of each aspect which includes aspects of multimedia display and programming aspects so that it can be said that the media that has been developed can meet the demands of learning needs.
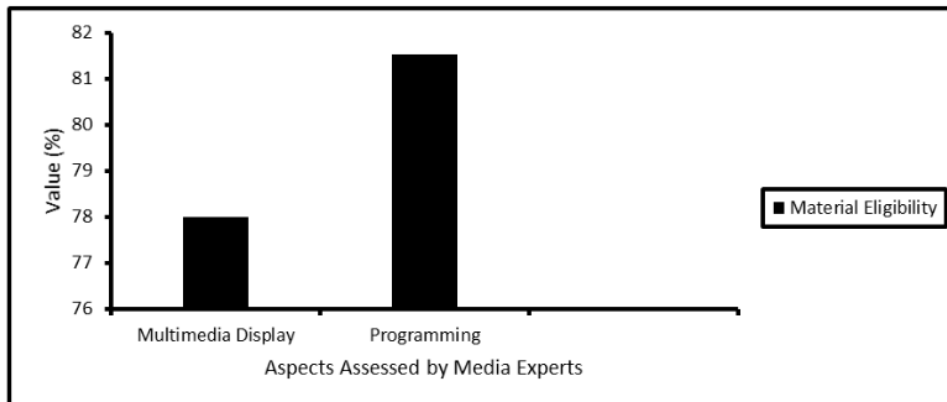

Figure 6. Learning Media Scores by Media Experts

Based on the data from Figure 6, it can be seen that the results of the assessment of instructional media compiled showed an average percentage of 83.10% included in the excellent category. Based on the responses of learning media experts, it was stated that this textbook is feasible for field trials.
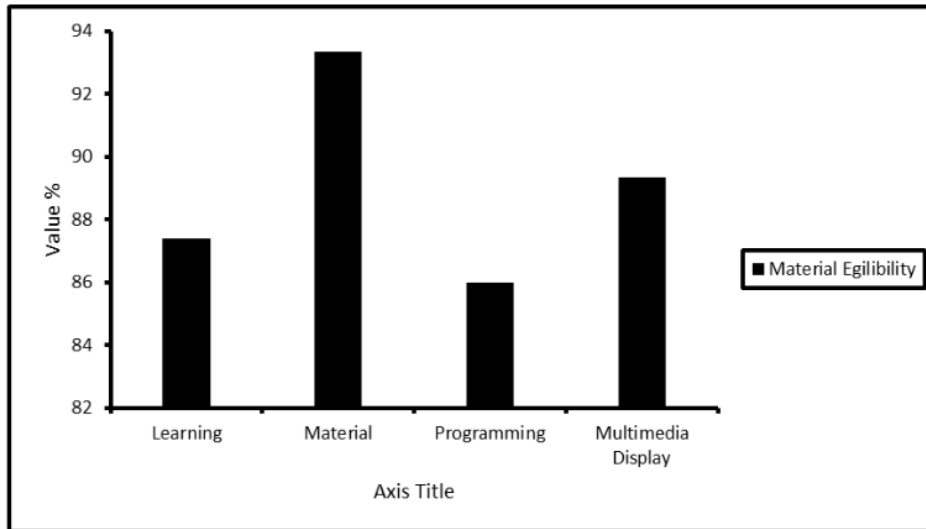
Figure 7. Learning Media Score Acquisition in Individual Trials

In accordance with Figure 7, the individual trial results on perceptions of the developed media show very good criteria with an average percentage of 89.05%. The implementation of individual trials aims to find out the initial opinion of students as users before conducting small group trials. Perception consists of several categories of assessment indicators namely material aspects, learning aspects, programming and multimedia display.
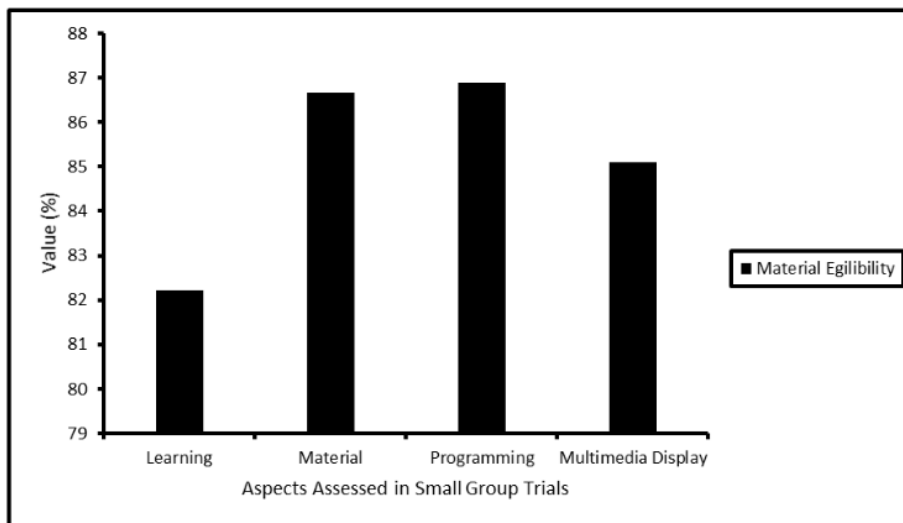
Figure 8. Acquisition of Learning Media Scores in Small Group Trials

Figure 8 shows the results of the perception assessment in small group trials which stated the media were very good with an average score of 87.40%. This result was obtained after a small improvement or revision of the problem in the individual trial. In the small group trial phase which is stated to be very good, there is no need for revisions so that it can be continued in the field trials.
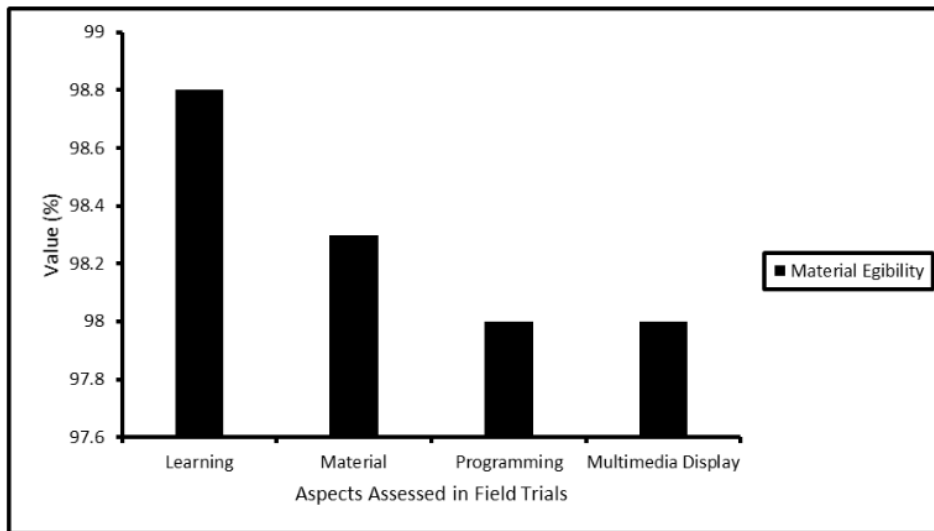
Figure 9. Learning Media Score Acquisition in Field Trials

Limited field trials were conducted on 30 students, the results obtained on the media that have been developed have very good criteria with a percentage of 87.40%, as seen in Figure 9. This limited field trial evaluation is the final stage of the project-based learning media product trial. which is packed in multimedia. The results of this assessment concluded that the media developed received very good responses for students as product users.

Effectiveness Test Stage

To find out whether the learning media is effective for use in fashion design courses, the learning media are tested using an experimental approach with two group post-test only design. The results of the effectiveness test of learning media can be explained as follows.

Product Effectiveness Test Research Results

Based on research that has been done in the Fashion Design course using project-based learning media that is packaged in the form of multimedia, the data obtained from 35 students were obtained through positive aspects, namely the lowest value 64, the highest 90, mean 77.43, standard deviation 6, 75 positive value data. Data on psychomotor values learned by project-based learning media obtained the lowest value of 60, the highest value of 90, the mean of 78.60 and a standard deviation of 7.02. Affective value data learned by project-based learning media obtained the lowest value of 60, the highest value of 85, a mean of 76.71 and a standard deviation of 6.29. 15). The data of positive value (control) which is learned by graphic media obtained the lowest value of 48, the highest value of 76, the mean of 60.57 and the standard deviation of 7.83. Data on psychomotor values (control) that were learned with graphic media obtained the lowest value of 54, the highest value of 80, the mean of 66.69 and a standard deviation of 6.87. The data of affective value (control) which was learned by graphic media obtained the lowest value of 50, the highest value of 75, the mean of 62.00 and a standard deviation of 6.88.

Test data analysis requirements are performed to determine the parametric statistical test of research hypotheses. Testing data analysis is done by testing the normality of research data with the Lilliefors test. From the test results using the t test, obtained thit = 13.360 and ttab = 2.00. If compared then thit

<ttab or 13.360> 2.00 then an alternative hypothesis (Ha) is accepted that there is a difference in the average student learning outcomes consisting of positive, psychomotor and affective who are taught using project-based learning media and students taught using graphic media.

Hypothesis testing results from the average overall value of learning outcomes consisting of a combination of positive, psychomotor and affective, the evidence is obtained that the effectiveness of project-based learning media conceptualized in multimedia is higher than using graphic media. And the overall results of the assessment of the effectiveness of media use amounted to 77.54% while 63.09% graphics.

The effectiveness of the media, obtained from the value of student learning outcomes. Miarso (2011) indicators that can be used to determine effectiveness in the learning process are: (a) good material organization, (b) effective communication, (c) mastery and enthusiasm for the subject matter, (d) positive attitude towards students, (e) giving fair values, (f) flexibility in the learning approach, and (g) good learning outcomes. Based on the results of statistical tests that have been done, that the average value of learning outcomes in the experimental group is 77.4% positive, psychomotor 78.6%, affective 76.71%. While the control class the average value of the positive aspect is 60.57%, psychomotor 66.6% and affective 62%. By looking at the guidelines and assessment criteria according to Sugiyono (2010) it can be concluded that the assessment of learning outcomes proves that the use of project-based learning media is more effective to improve learning outcomes and is appropriate to be used as a companion media in fashion design learning.

IV. DISCUSSION

From the results of the research that have been delivered previously, there are three important things that need to be discussed in this study, such as:

Learning Media Needed for Learning Fashion Design

From the above, it can be seen that the instructional media needed by instructors are multimedia learning media that can make learning more effective and interesting. While from the student side they want to learn medium that can be studied independently. Both the needs of lecturers and students can be met with the application of multimedia learning media, because multimedia characteristics that combine more than one media, so that it becomes more interesting, and interactive has the ability to respond to users, can explain themselves, meaning that they can be studied independently without having to accompanied by a teacher (Dalle & Ariffin, 2018). Moreover, research conducted by Kadaruddin (2017) also found that the use of instructional media in the form of multimedia is more interesting and can make students more motivated and enthusiastic to learn which can further increase student learning achievement. Likewise with the research of Heijstra & Sigurðardóttir (2018) which confirms that one of the things that make using multimedia material better than traditional learning is that students can see material with a more attractive display over and over again anytime and anywhere using their mobile devices. have. In addition, the ability of multimedia learning media to provide instant responses, especially for interactive quizzes can make students more interested in learning (Su & Chen, 2018). The use of multimedia in the classroom is able to attract students' attention so they stay focused on learning (Nusir, Alsmadi, Al-Kabi, & Sharadgah, 2013).

Similar research and results were also carried out by Silalahi, Hutabarat, Tarigan, & Chandra (2018) who found that the use of offline multimedia learning media was also able to increase student motivation and learning achievement. In addition, the use of media learning media also supports the implementation of learning by increasing the interaction of students and teachers, making learning

more innovative, dynamic, and more suitable for the learning process outside the classroom (Almara'beh, Amer, & Sulieman, 2015). In addition, the use of multimedia learning media can also make students concentrate on the learning process longer (Liu, 2012). Furthermore, the use of multimedia learning media has a very good effect on students who have a visual learning style (Smith & Woody, 2000).

The use of multimedia in the learning process can also make learning more effective and enable students to interact with fellow students (Sakat, Zin, Muhamad, & Ahmad, 2012). In terms of efficiency, the use of multimedia learning media is more efficient in terms of time and cost because to multiply the media does not need to print costs in terms of time students can learn anytime and anywhere (Turan & Goktas, 2016). Multimedia learning media can also be used as a medium to make face-to-face learning processes more effective and can replace the position of the teacher when students learn independently outside the classroom (Taiwo, 2009; Ahmad & Ahmad, 2018). In addition, the learning media in this study is intended to improve students 'practical ability in fashion design, it is very appropriate because the use of interactive learning media is proven to improve students' practical abilities (Baharuddin & Dalle, 2017).

When viewed from the side of the demands of the use of technology in the era of education 4.0 to welcome the industrial revolution 4.0, then the use of multimedia technology in learning is a must. Because the hallmark of learning 4.0 is the use of digital technology in the learning process, especially smart technology (Keser & Semerci, 2019). Thus, learning media in the form of multimedia is one of the manifestations of the use of digital technology that can be implemented in the era of education 4.0. In addition, it needs to be understood that at the higher education level, most students currently studying are in the Z generation. They are children born between 1995 and 2009 (Cilliers, 2017). Judging from its characteristics, they are familiar with the use of information technology and expect technology-based learning because it is faster and connected to the internet (Rue, 2018). Thus, it means that Generation Z is very ready to learn to use technology and the readiness of these students is very important in ensuring the success of learning using technology (Kim, Hong, & Song, 2019). In fact, generation z does not only require but is already at the stage of needing technology-based learning, because the use of technology in learning can increase their learning motivation (El-Seoud, Taj-Eddin, & Seddiek, 2014). Of course, if you want the results of learning to use technology to the maximum, you must not only be prepared for students but also their teachers (Basak, Wotto, & Be´langer, 2018). For that reason, all teachers must be prepared to adapt and be able to use technology in the learning process, so that it will create a comfortable atmosphere in the learning process with students from generation z (Hartman, Townsend, & Jackson, 2019).

By having readiness, teachers and students will have confidence in using technology in learning. The confidence will then become an important capital for students, because self-confidence, especially in the academic field (academic self-efficacy) has been proven to have a relationship with learning achievement (see Aslam & Ali, 2017; Drago, Rheinheimer, & Detweiler, 2018;). Thus, various activities those are able to increase students' confidence in following a learner need to be carried out by teachers (Razek & Coyner, 2014). Furthermore, by having confidence, students will have clear achievement targets and they will try to achieve these targets so that it will reduce the negative influences that can make their learning enthusiasm decrease (Alhadabi & Karpinski, 2020).

Besides self-confidence, learning satisfaction will also affect student learning success (Doménech-Betoret, Abellán-Roselló, & Gómez-Artiga, 2017). Learning satisfaction is very important to make students feel motivated to learn. Technology-based learning media can make students more satisfied with the learning process compared to the use of traditional learning media in the form of printed books (Machado-Da-Silva, Meirelles, Filenga, & Filho, 2014). There are three things that are

important in ensuring student satisfaction in using technology-based learning media, namely: how to deliver the material, the quality of the instructor, and the condition of supporting facilities (Teo & Wong, 2013). In addition, the use of technology that makes the interaction between students more intensive also affects student satisfaction (Goh, Leong, Kasmin, Hii, & Tan, 2017).

Developed Learning Media Proven Valid

Various validity tests have been carried out to ensure that learning media in the form of project-based multimedia that are developed are suitable for use in the actual learning process. Knowing the validity of a learning media is very important before the media is used in the actual learning process. Therefore, the implementation of the validity test is intended to find out whether the learning media developed has met the quality criteria that have been set previously (Bujeng, Kamis, Hussain, Rahim, & Soenarto, 2019). Besides that, testing the validity of instructional media is also intended to ensure that the learning media can make students achieve the learning objectives because invalid learning media will produce pointless learning (Moyo & Mann, 2018; Ahmad & Sahar, 2019). In addition, this validity test is also intended to find out whether there are problems experienced by teachers and students in the process of implementing multimedia learning media that is implemented with a project-based learning strategy. So, in terms of learning strategies with developed media it is also expected to increase learning motivation and ability to solve problems, in accordance with the strengths of implementing project-based learning as in the findings of Chiang & Lee's (2016) research. In addition, in the validity test, the things that are the strengths of project-based learning are also considered, namely: the realization of the use of the latest technology that is appropriate, quality group work, the ability of teachers to help, encourage, and provide direction to students, the balance between providing an explanation depth and appropriateness of judgment (Kokotsaki, Menzies, & Wiggins, 2016). Thus, learning media in the form of project-based multimedia is expected to truly be a learning medium that can improve student learning achievement, as the results of research conducted by (Ayaz & Söylemez, 2015).

Learning Media Can Improve Student Learning Achievement

The results of this study are in line with research Istiana (2012) whose results state that there are differences in learning outcomes between before learning to use media in the form of multimedia and after learning to use these media. The level of effectiveness of the media to increase learning outcomes is high, this means that student learning outcomes increase after using textbooks. Astuti's (2013) research results show that the media developed to provide benefits and added value, especially as teaching materials for independence. Likewise with research conducted by Hellystia (2019) who found that the use of multimedia in the form of websites also had a positive effect on improving student learning outcomes. The use of learning models and the latest multimedia technology is also reported to be able to provide various benefits in the learning process. Like for example, the application of mobile devices for teaching has been proven to provide benefits in increasing student learning achievement (Sung, Chang, & Liu, 2016). In addition to improving learning achievement, learning using mobile learning is also confirmed to be able to improve students' communication and interaction skills in the teaching and learning process (Elfeky & Masadeh, 2016). Implementation of the use of mobile devices such as the use of online quizzes via smartphones can make the learning process more fun for students, make students more focused, and motivate them to learn more because they can see the results of their tests directly as well as the results of their friends (Florenthal, 2018). Research using blended learning and flipped learning is more effective than learning that is only done with the lecture method (Luna & Winters, 2017). In addition, the learning model of flipped learning and blended learning that utilizes online learning prior to the implementation of face-to-face learning is also reported to not only increase interaction between instructors and students but also increase

interaction between students which makes learning truly centered on students and makes students become more active and responsible for their learning process (see Srinivasan & Kumar, 2019; McLean & Attardi, 2018). Flipped learning and blended learning can also increase student learning satisfaction because they can get information from friends and teachers more effectively (Peterson, 2016).

V.   CONCLUSION

From the explanation above, there are three things that can be concluded from this study. First, the learning media that is needed by the fashion design study program are project-based learning media in the form of effective and attractive multimedia to be used by lecturers in face-to-face learning and at the same time can be used as interactive independent learning media by students. Second, the results of validation from individual trials, small group trials, and limited field trials of the developed media are included as the "Very Eligible" category. So that it can be accepted and suitable to be used as a medium learning. Furthermore, project based learning media products on fashion design subjects whose products are packaged in multimedia with Adobe Flash CS6 Software are eligible and suitable to be used as a learning media, based on the assessment of material experts, instructional design experts, instructional media experts, showing that the overall average is categorized feasible after several revisions so that the media can be used for further trials. The use of project-based learning media can more effectively improve learning outcomes when compared to using graphic media, learning with project-based media is learning that involves students working in groups to compile a report, experiment, or other project, so that learning outcomes are learned. By using project-based media from the positive, affective and psychomotor aspects are higher than the learning outcomes learned using graphic media.

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