Developing an interactive learning multimedia basic competence for using facial care tools with technology in students of vocational education

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Abstract. This study aims to: (1) develop interactive multimedia on the basic competence of using facial care tools with technology of the students of SMK Negeri 3 Purworejo; (2) reveal the feasibility of the developed interactive multimedia; (3) reveal the effectiveness of the use of the developed interactive multimedia. This research is research and development applying the ADDIE development model. The subjects are 28 grade 11 students of Beauty of SMK Negeri 3 Purworejo. The data collection is done through interviews, observation, and using a questionnaire and test. The data collection instruments include interview guide, observation guide, product feasibility questionnaire by material experts, product feasibility questionnaire by media experts, product response questionnaire. The data analysis is qualitative, quantitative, descriptive. The results of this research are as follows. (1) The developed interactive multimedia was adapted to the ADDIE development model. (2) The developed interactive learning multimedia is very feasible according to material experts with average score 63 the feasibility percentage of 92.64%, very feasible according to media experts with average score 68.5 the feasibility percentage of 90.13%, and student assessment response to learning multimedia with average score 87.27 the feasibility percentage of 91% that is very feasible to use. (3) The developed interactive multimedia is effective, as shown by the increase in learning achievement as indicated by the different average scores of the pre-test and post-test. The average pretest score is 56.31 and that of the post-test is 89.05. Based on this score an N-gain of 0.75 is included in the “high” category.

1. Introduction
Education is a must for someone to take to improve quality and competence in themselves. Vocational secondary education as a provider of middle-level skilled workforce has an obligation to equip students to have competency and high competitiveness in entering the workforce. Vocational education aims to shape students to have skills, life skills, understanding, behavior, attitudes, work habits and applications to the work needed according to the demands of the business world and industry [1]. In line with the main objectives of vocational education, it will have an optimal impact on all aspects, one of which is in forming quality learning in order to produce graduates who are competent and have high competitiveness. The supporting aspects are related to the role of the teacher and the facilities available in the school as well as the learning component [2].

Components in the teaching and learning process include several things, namely goals, learning materials, teaching and learning activities, methods, media or teaching aids, sources and evaluations. One important component in learning is learning media [3] [4]. Learning media is the
media used in learning, which includes teacher aids in teaching as well as means of messenger from learning resources to the recipient of the message namely students [5]. This is in accordance with the opinion of Victor (2018) which states that the use of visualization of teaching materials through the incorporation of graphics, audio and video helps students understand instruction and is more effective than using conventional methods).

In the global era, the selection and use of learning media must be in line with the development of science and technology that has developed very rapidly. Teachers are required to be able to utilize information and communication technology for the benefit of the teaching and learning process, so that the ongoing learning process becomes more effective. To prepare vocational graduates who are skilled and ready to use, SMK Negeri 3 Purworejo provides students with a variety of subjects to support the knowledge and skills of students in entering the workforce. Face care with technology is one of the subjects accepted by class XI students in the field of beauty. This lesson can lead students to a basic understanding of facial care with technology. One of the competencies that must be achieved by students is related to the basic competencies of using facial care tools with technology. Along with the development of technology in the field of beauty, the SMK Negeri 3 Purworejo provides face care tools with technology to support students' competencies in face care learning with technology.

The basic competence of using facial care tools with technology is the basic material that must be understood by students. If students understand the concept of using the tool well then the steps taken in performing facial care and the results of treatment obtained will be maximized. To support the implementation of the practice so that it can run well, students are required to understand the theoretical concepts learned beforehand. If the theoretical concept is well understood, it will be easier to implement the understood theory. With this understanding, graduates are expected to be able to meet global competition standards in the world of work.

Definition of understanding that is when students can connect new knowledge and old knowledge so that new knowledge emerges. So the point is that learning to understand something is not only focused on the new experience they get, because learning to understand it will feel complete if we can combine old knowledge with new knowledge. Based on these opinions, students are said to be able to understand the concept if students get new knowledge from the learning experience gained [6].

Understanding the concept in this study is obtained from the provision of questions that are in accordance with indicators of understanding concepts that can help students improve the ability to understand the concept. The ability to understand students' concepts can be improved through the facilities of practice questions in the material book. Based on these opinions, this study proves the accuracy of the use of practice questions to improve students' conceptual comprehension abilities [7]. However, the use of the media was felt to be not optimal in its implementation in schools which were observed in this study, namely at SMK Negeri 3 Purworejo. Based on the results of preliminary studies conducted, the constraints found were related to the limited use of media and learning resources so that the impact of underprivileged students was related to basic competencies in using facial care tools with technology. Because, the completeness of the media to be used in the learning process is one of the factors that are very important in supporting student competence.

To deal with the obstacles faced, we need a multimedia that can support the achievement of learning activities. The use of multimedia in learning functions as a solution that allows to improve the quality of learning in the classroom, and as a viable alternative to overcome the limitations of teachers in teaching. In addition, multimedia in the learning function as a facilitator, transmitter, connector, and others [8]. Multimedia in learning can enable communication processes to be more effective in achieving desired goals, namely changes in student behavior [9].

Multimedia is a mixture or mixture of two or more media formats such as text, graphics, animation, and video to integrate information into a computer. Interactive multimedia is the use of computers to integrate text, graphics, audio, moving images (video and animation) into a single unit with the right links and tools to enable multimedia users to navigate, interact, create and communicate [4], [10]. While according to [11], Multimedia is one component of e-learning that acts as a medium for delivering information / messages / instructions. Multimedia technology
continues to grow and increases in use. The components in interactive multimedia are text, image, animation, audio, full-motion and live video, and interactive links.

Interactive multimedia is a multimedia that is equipped with a controller and can be operated by the user, so that the user can choose what is desired for the next process [8]. This statement shows that one of the characteristics of interactive multimedia is having a controller. This controller allows users to determine the process according to their wishes. This is in accordance with the opinion of Topala, [12], effective learning can produce positive attitudes and feelings for students. The use of multimedia technology in the learning process not only provides a more concrete learning experience, but also helps students integrate experience. Multimedia technology empowers the educational process by increasing interaction between teachers and students. In practice, the use of multimedia technology applications can help students understand in depth the material being taught, as well as overcome space, time and equipment limitations.

The presence of interactive multimedia assisted by Adobe Flash, which was added with material and questions that built students' understanding of concepts, made this interactive multimedia able to improve students' conceptual understanding of face care learning with technology. Material about facial care that is published in full and in accordance with the learning objectives coupled with the provision of questions that can measure students' understanding of learning helps students to understand the concept well [13]. This is in accordance with Ms. Fui-Theng Leow's [14], study of interactive multimedia learning as learning innovation at the University of Malaysia showing increasing student learning achievement and increasing positive attitudes of students becoming more active and motivated in the learning process. In addition, Research on the development of the learning media for the yogya paes ageng bridal makeup on Indonesian bridal makeup courses showed an increase in student learning outcomes using learning video media.

From the description of the problems above, it is necessary to develop an interactive learning multimedia basic competency for using facial care tools with technology that can be a means of supporting students' understanding of having established competencies. Based on the results of the preliminary study described earlier, alternative media are needed and appropriate to use, namely by using interactive learning multimedia in the teaching and learning process. This research and development produces an appropriate and effective interactive learning multimedia for use in learning related to the basic competencies of using facial care tools with technology.

2. Research Methods
The subject of the limited field trial consisted of 15 students who were students of the XII class of beauty management at SMK Negeri 3 Purworejo representing low, medium, and high abilities. The main field trial subjects in this study were the XI grade students of SMK Negeri 3 Purworejo consisting of 28 students. Sampling is done by purposive sampling technique. The procedure for developing interactive multimedia is carried out through several stages, namely: a. analyze stage includes field analysis and needs analysis; b. the design stage includes the process of material design, making flowcharts and storyboards, and compiling instruments; c. the development stage includes making products, performing instrument validity, conducting validations by material experts and media experts and conducting revisions followed by conducting initial trials; d. the implementation phase includes the activity of giving the initial test (pre test), implementing the use of interactive learning multimedia products, and giving final tests after using the product; e. evaluation stage is to evaluate and analyze student learning outcomes to determine the effectiveness of the product being developed.

Data collection is done through interviews, observation, questionnaires and tests. The data collection instruments used were interview guideline sheets, observation sheets, product feasibility questionnaires by material experts, product feasibility questionnaires by media experts, product response test questionnaires for products and tests. Data analysis was conducted in qualitative and quantitative descriptive. Internal trials in this study include product feasibility testing by media experts and material experts. While external trials in this study include testing of teacher responses, testing student responses, and product effectiveness tests. The whole series of trials is carried out to produce a product that is feasible and effective to use in face care learning with technology.
Data collection techniques in this study the instruments used in this study consisted of 4 types, namely interview techniques, observation, questionnaires, and tests. While the data collection instruments in this study used interviews, observations, questionnaires, and tests. Analysis of preliminary study data in this study used descriptive analysis techniques. Product feasibility analysis is done by tabulating all data obtained from expert judgment as a validator. The quantitative data obtained is then converted by determining the score range and qualitative criteria. Determination of the range of scores and product eligibility criteria multimedia developed in this study refers to the formula in table 1.

Table 1. Eligibility Criteria for Product

| No. | Interval                            | Criteria  |
|-----|-------------------------------------|-----------|
| 1   | (Mi + 1.5 SD) ≥ X ≤ (Mi + 3 SD)     | Very      |
| 2   | Mi - X ≤ Mi + 1.5 SD                | Good      |
| 3   | Mi - 1.5 SD ≤ X ≤ Mi                | Good      |
| 4   | Mi - 3 SD ≤ X ≤ Mi - 1.5 SD         | Very Bad  |

Analysis of product effectiveness in this study was carried out by descriptive statistical analysis techniques. The learning outcomes of the pretest and posttest will be searched for the amount and the average of the learning outcomes and then compared the mean values between the pretest and posttest. Furthermore, the data is analyzed using the trend data formula to determine the effectiveness of using interactive multimedia learning [15]. The average rating uses the following formula.

Table 2. Categories of Trend Data

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R = \frac{\sum X}{N}
\]

Information:
- \( R \) : Average
- \( X \) : Results of scores (Pretest / posttest) students
- \( N \) : Number of Students

3. Result and Discussion

The results and discussion in this study are explained by the following explanation.

(a) Evaluation of media experts. Aspects assessed by media experts to determine the feasibility of media quality contained in this interactive multimedia include navigation aspects, programming aspects, aspects of writing (text) and aspects of the display. Quality multimedia must have a theme that relates to the quality of the design of text, graphics, animation, video and effects that are used, so that the display of multimedia that is made is presented in an interesting and can be utilized optimally [16]. The media expert's assessment of interactive multimedia developed in this study showed that the overall score was 68.5. The score was in the "Very Feasible" category. Data from media expert validation can be seen in table 3.

Table 3. Data of Media Expert Validation Results

| No. | Aspect       | Average Score | Categories       |
|-----|--------------|---------------|------------------|
| 1   | Navigasi     | 7             | Very Feasible    |
| 2   | Pemrograman  | 15            | Very Feasible    |
| 3   | Tulisan/Teks | 14            | Very Feasible    |
Tampilan: 32.5 Very Feasible

Average Total Score: 68.5 Very Feasible

(b) Assessment of material experts
Aspects assessed by material experts to determine the feasibility of the quality of material contained in the multimedia interactive learning include aspects of learning and content. Media development in this case is interactive multimedia learning must contain complete material content and provide facilities to achieve the learning objectives to be achieved. It emphasizes that the components of completeness and conformity of content are very important things to consider in making interactive learning multimedia [17]. The results of the material expert's assessment of the interactive multimedia developed showed an overall score of 63. The score is at "Very Feasible" category. Thus, the interactive multimedia developed is deemed feasible to be tested in the field according to material experts. Data media expert validation results are shown in Table 4.

| No. | Aspect    | Average Score | Categories |
|-----|-----------|---------------|------------|
| 1   | Learning  | 29.5          | Very Feasible |
| 2   | Materials | 33.5          | Very Feasible |
|     | **Average Total Score** | **63** | **Very Feasible** |

(c) Test the product user response
The results of testing the product user response showed an average total score of 87.27. These results are in the "Very Feasible" category. In addition to giving an assessment or response to the product being developed, students also comment on the product being developed. After the product is declared eligible based on the response test carried out, the product is then tested at the product effectiveness test stage.

Table 5. Product User Assessment Results Data (Students)

| No. | Aspect       | Average Score | Categories |
|-----|--------------|---------------|------------|
| 1   | Ease         | 21.53         | Very Feasible |
| 2   | Materials    | 25.67         | Very Feasible |
| 3   | Attractiveness | 14.57   | Very Feasible |
| 4   | Usefulness   | 25.5          | Very Feasible |
|     | **Average Total Score** | **87.27** | **Very Feasible** |

(d) Product Effectiveness Test.
Product trials are conducted to determine the compatibility of the products developed in this study. The technique used to get product support is the One-Group Pretest Posttest design technique which involves 28 students of class XI in the beauty management department of SMK Negeri 3 Purworejo. The evaluation process uses a One-Group Pretest Posttest design technical study carried out by comparing the value of pretest and posttest student. The product trial results in this study can be seen in Table 6.

Table 6. Trends in Learning Outcomes Scores

| Data | Pre-test | Post-test | Nilai Ideal | N-Gain |
|------|----------|-----------|-------------|--------|
| Mean | 56.31    | 89.05     | 100         | 0.75   |
Based on the data presented in Table 6, there is an increase in the tendency of scores between pre-test averages and post-test mean values. The mean score of the pre-test was 56.31 and the mean score of the pre-test was 89.05. Then, the recapitulation of Gain Score of student learning outcomes can be seen in Table 7.

Table 7. Recapitulation Results Gain Score Learning Outcomes

| Rekapitulasi | Minimum | 0.54 |
|--------------|---------|------|
| N-gain       | Maximum | 0.93 |
|              | Mean    | 0.75 |
| Score        | High    | 19 (67.86%) |
|              | Medium  | 9 (32.14%) |
|              | Low     | 0 (0%) |

Based on the data shown in table 6, it is known that the N-gain obtained is 0.75. This shows an increase in pretest and post-test learning outcomes are in the High category. So that, the analysis of the score trend table that has been done, it can be concluded that the product developed in the form of interactive learning multimedia is declared effective for use in class XI students in the competence of using facial care tools with technology.

4. Conclusion
The results of this research are as follows. (1) The developed interactive multimedia was adapted to the ADDIE development model. (2) The developed interactive learning multimedia is very feasible according to material experts with average score 63 the feasibility percentage of 92.64%, very feasible according to media experts with average score 68.5 the feasibility percentage of 90.13%, and student assessment response to learning multimedia with average score 87.27 the feasibility percentage of 91% that is very feasible to use. (3) The developed interactive multimedia is effective, as shown by the increase in learning achievement as indicated by the different average scores of the pre-test and post-test. The average pretest score is 56.31 and that of the post-test is 89.05. Based on this score an N-gain of 0.75 is included in the “high” category

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