Project-based Interactive Learning Material for Vocational Students

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ABSTRACT

This study revealed: 1). Developing Project Based Learning Interactive Content specifically for vocational students; (2). Seeing how much influence the interactive content of project-based learning has on students' learning interests; (3). Knowing the feasibility of learning interactive content products through feasibility tests and product effectiveness tests. This research is development research using a 4-D model with 4 main stages namely Define, Design, Develop and Disseminate. The development of interactive learning content based on Project Based Learning produces features in the form of: 1) Materials, 2) Videos & projects, 4) Interactive quizzes, 5) Learning resources, and 6) Instructions for Use. The results obtained from the validation of material experts scored 83.33% with the qualification "very feasible", media experts scored 86.90% with the qualification "very feasible". The results of the small group trial obtained a value of 85.24% with the qualification "very feasible", and the large group trial obtained a value of 88.87% with the qualification "very feasible". Students' interest in learning showed an increase of 12.11% in the very high category obtained from a pre-test score of 75.31% in the "very high" category and a post-test of 87.42% in the "very high" category. This shows that interactive learning content based on Project Based Learning can increase interest in learning through empirical and written studies.

Keywords: Vocational, Learning Interactive, Project Based Learning.

1. INTRODUCTION

The development of interactive learning content is actually nothing new in the world of education. The concept of interactive content development refers to how to develop learning materials that can be used simultaneously in the implementation of the learning process, the relationship is with learning interest. Interest can have a positive influence on the teaching, both knowledge and skills in each subject for students [1]. The factor that pays attention to students in fostering interest in learning in a lesson is the media used, the concept that is closely related to learning is learning media as an intermediary between students and teachers or also as a source of learning. Media is a learning aid that is used by teachers in class, as well as a medium or transmission of messages from sources to recipients [2]. Learning with media is a complementary method for collaborating learning with books, television, computers and multimedia environments that help students understand a lesson. Media is differentiated based on the characteristics of technology, systems, processing abilities that are cognitively relevant and instructional designs that can interact with students to influence cognitive processes so that they can be used as alternative learning media [3]. Interactive learning media can maximize the learning process of students and provide different experiences in learning because it can create feelings of pleasure while creating different learning knowledge and can increase interest in learning [4].

Media for learning is directly related to the learning model so as to create interest in learning in 2D and 3D Animation subjects. Something needs to be paid attention to before the learning media becomes a learning product, one of which is that the learning media must adapt the learning model used. There are other

factors as a reference in fostering interest in learning divided into 2, namely internal and external which have an impact on interest in learning, namely learning methods/models that match the characteristics of the class so that they can create a desire to follow student learning with enthusiasm in class, and can stimulate participation students to be directly involved in learning, learning by providing new experiences as well as fun to take part in the class, namely being able to use a variety of learning methods/models that suit the circumstances of students [5]. The choice of learning model/method adapts to the characteristics of the students which allows the creation of a different class experience than usual. The feeling of fun and enthusiasm for participating in learning is one of the desires that can be experienced by students [6].

The project learning model (Project Based Learning) is a learning model that is suitable for implementing the 2013 curriculum because it has a basic learning model based on students while providing problems effectively and new experiences related to learning according to the needs of the class. One of the problem-solving processes encountered in learning is the initial experience of providing and integrating new knowledge [7]. The use of Project Based Learning learning models that are implemented into learning media can increase interest in learning in class. Arsyad believes that the use of media in learning can generate new desires and interests as well as motivation to learn and have a psychological impact on learning [8].

Interactive media is a combination of 2 or more media such as text, audio, images, graphics and video that are manipulated by users to control natural behavior or someone's command behavior [9]. Changes in the paradigm of education in Indonesia at the same time support the use of interactive learning media where the learning process is technology-based. In the future, the use of interactive learning media based on digital technology will begin to be applied in the learning process at schools. This is adapted to technological developments in the field of education. Students who tend to use more technology such as smartphones, tablets, computers, and laptops in several main fields in the field of education are already heading towards the era of digital-based education. The use of technology is a necessity at all age levels [10]. Students in the digital era are the younger generation who cannot be separated from the use of technology, so it is necessary to develop learning media that is related to the use of existing technology. Therefore, in classroom learning, the teacher becomes a facilitator who facilitates students so that they can develop or add to their knowledge and experience. Learning media are needed that can combine the two functions of the teacher, namely as a facilitator as well as a source of learning and increase interaction and interest. Digital interactive learning media can be used to support learning that provides active feedback from students.

Interactive learning content is the delivery of material by utilizing animation, video, sound films and images using computer assistance where there is active interaction or response from students so that there is media interaction with students, teachers and students and even between students and students. Most students in vocational schools use Android-based smartphones because the price is relatively cheap as well as relatively easy to operate so that they can be a helpful tool during the learning process.

In interactive learning activities, in relation to learning that is going well, several forms of communication occur, namely two-way communication, one-way communication, and multi-way communication. communication) takes place between teachers and students [11]. The teacher provides material and students participate actively in responding (feedback) to the material so that the interaction between the teacher and students goes well. The use of interactive media really helps teachers to increase interest in learning. Interactive learning media can give a clear picture to students. However, there are weaknesses in the use of interactive learning media, namely there are demands for appropriate specifications for using interactive learning content, there is a need for guidance and supervision from the teacher because it will lead to new understanding from students, teachers also have difficulty making interactive learning media. Many teachers have not been able to take advantage of interactive learning media with effective technology and technology for learning.

2. LITERATURE REVIEW

There is a connection if learning wants interaction between one another, this proves that the method of teaching and learning activities is a discussion activity in which someone conveys notes or messages/teacher (sender of the message) to an individual or several people (recipient of the message). There are activities/flows of communication [12]. Messages that are sent are generally data or explanations from the sender (source) of the message and then the message can be turned into codes, symbols or symbols such as speech, visuals, even sound through electronic media intermediaries such as radio, television, film which records will later be obtained by the acceptor. records through visual and auditory devices to be processed so that the message sent by the source of the message whose contents are easy for the recipient to understand. The effectiveness of a communication is related to the tools used to communicate. Basically the method of teaching and learning activities is a way of

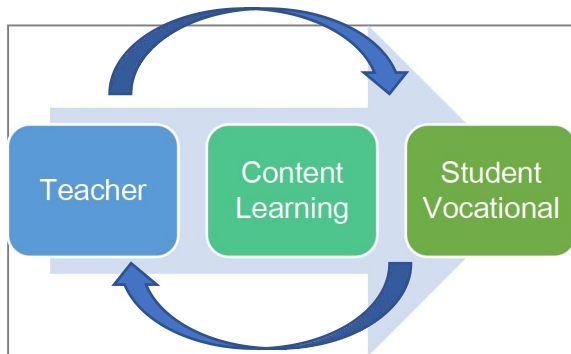communicating, therefore the tools used are tools in teaching and learning activities.

Figure 1 Learning Process

Figure 1 shows that in the way of teaching and learning activities there are messages that must be communicated. A message is conveyed by the teacher to students through a tool using a special teaching and learning activity method called the method. Media is a learning aid in guiding and carrying a note from the point of practice to the acceptor of learning messages, namely students [13]. In the system of modern teaching and learning activities, students are not only the audience or the people who receive the mandate but can also act as communicators or record reporters. The role of the media in the communication of teaching and learning activities is very necessary to increase interest and success in achieving the direction and skills of teaching and learning activities.

Learning is referred to as a system because in learning there are parts that are interconnected in order to achieve a goal that has been formalized. The learning parts include: directions, modules, procedures, tools and assessments, each part of which is closely related and in one unit. According to Rudi Susilana, the method of preparing learning always begins with the formulation of instructional objectives [14]. Efforts to support the achievement of learning objectives are supported by learning tools that match the characteristics of the user. After that the teacher determines the tool and conducts an assessment. The results of the assessment can be input material or feedback on learning activities that have been carried out. In the use of tools, it is necessary to look at how the effectiveness of what are the aspects and factors.

The characteristics of the Project-based Learning form include teaching participants who are faced with real cases to find solutions to these problems, carrying out projects in teams to solve these problems. The form of Project-based Learning shares experience in finding problems that match the project to be selected by teaching participants and project objectives can be resolved as expected.
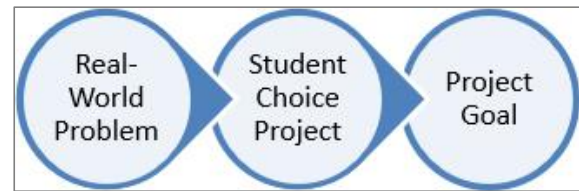

Figure 2 PJBL Concept

In the Project-based Learning form, participants not only understand the content to be worked on but also develop communication and presentation skills, are trained to develop skills both in life skills and growing in society, communication skills and presentation skills, time management skills, as well as skills in assessment self-reflection and reflection as a basis for critical thinking in every problem faced. As a result, the characteristics of the modules that match the application form of Project-based Learning are: a). Having basic competencies that emphasize more on the views of skills or insights at the level of application, analysis, assessment. b). Can create a product. c). Have an addiction with clear cases or everyday life.

3. METHOD

Research and development is carried out by following ten procedural steps, starting from collecting need assessment data to producing products that have been tested and disseminated to users [15]. The ten stages that must be carried out include: (1) the research and information collecting stage; (2) the planning stage (planning); (3) the stage of developing a pre-product plan (develop preliminary from product); (4) preliminary field testing stage (preliminary field testing); (5) product revision stage (main product revision); (6) product trial stage in the field (main field testing); (7) operational product revision stage; (8) operational field testing stage (operational field testing); (9) final product revision stage; and (10) the dissemination and implementation stage. The development method applied in this study is the 4-D (Four-D) development model. Where the four stages must be carried out in stages in the 4-D (Four-D) development model, namely Define, Design, Develop and Disseminate (trial stage) [16]. The 4-D (Four-D) model is a development research model that can be applied to the manufacture of learning products, for example, media and teaching materials, learning strategies and other learning products.

The development model in learning must be programmed and systematically arranged so that the results are in accordance with what is needed by students and fulfil the rules of development in learning. The selection of the 4-D (Four-D) development model is based because the 4-D (Four-D) model is in accordance with the development of learning media products that have sequential flow and are in accordance with the

theoretical foundation of learning design. In addition, the stages or steps in the 4-D (Four-D) model are in accordance with the flow of developing learning products in relation to digitalization in education. The 4-D (Four-D) model consists of 4 stages when described in chart form as follows:
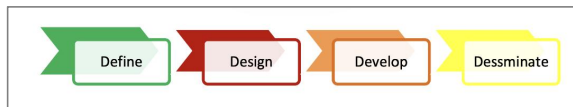

Figure 3 Design Stages of 4D Model

The defining stage is carried out to determine the need for interactive media development. At this stage determine the conditions in the field, as well as determine the learning environment. Researchers identified by conducting interviews and needs analysis questionnaires. The second stage in the 4-D(Four-D) development procedure is the design or design stage. This stage is the stage where the product concept planning will be developed. The product design is tailored to the needs and character of students as well as teachers. Researchers determine the design of interactive learning media with articulate storyline 3.

The development stage is the product realization process. After preparing a conceptual design or framework regarding new learning media, then the conceptual framework/design can be realized by the author into an interactive learning media product that is ready to be tested. In this stage, making a product is making a prototype of a multimedia component so that it becomes a product that is packaged into an interactive learning media that can be used and is ready for this validation. In addition to the implementation or realization of making learning media products at the development stage, validation and evaluation stages are also carried out so that the resulting product is valid and very suitable for learning needs.

The Disseminate stage is the fourth stage in the 4-D (Four-D) model. This stage will be socialized with interactive learning media after validating and testing the product. The purpose of this stage is to disseminate more widely the media that has been successfully made and is suitable for use. Socialization can be done online or offline if possible. Online socialization is carried out using zoom meetings as an intermediary for face-to-face meetings, while offline socialization is carried out face-to-face at schools, while still adhering to health protocols in its implementation.

4. RESULT AND DISCUSSION

The result of the development of this product is the development of interactive learning content that students can access via smartphones, tablets, laptops and computers with the html5 extension. This learning media contains 2D and 3D animated material in the form of text, images and videos, there are various kinds of electronic barcode modules that students can use to support learning activities and can be accessed online, besides that the learning media contains project-based learning that can help participants students hone their skills, especially in material for making object images with 2D animation applications and making tweening animations. This media content is equipped with instructions for use on the login page, so users can first read the instructions on the start page in order to make it easier for users when using the media. Learning content has 6 menus, namely menus: 1) Basic Competency, 2) Materials, 3) Video & Project, 4) Learning Resources, 5) Quiz, 6) Profile.

Figure 4 Learning Content Development Results

Interactive media content is an interactive learning media where students can interact directly with the media. The interactive layout of this media lies in questions where the user can answer questions on the video and project menu whether they have worked on the project that has been assigned or not, then the media will provide feedback to the user, apart from the menu being interactive on this media it is also located on the quiz menu where after the user has finished working on the media quiz, he will immediately provide feedback in the form of a score or quiz score obtained, and the user can find out whether his score has met the KKM or not. In Figure 4 is the result of the development of learning content.

The results of the learning media validation show an average total percentage of 83.33% with the qualification "Very Eligible".

The value of each aspect shows an average of 66.67% from the aspect of the percentage of information with the qualification "Very Eligible", an average of 87.50% from the aspect of cognition content with the qualification "Very Eligible", an average of 84, 09% from the content aspect with the qualification "Very Eligible" and an average of 100% from the instructional aspect with the qualification "Very Eligible". These

qualifications are based on Table 1. These calculations are obtained using Akbar's (2012) descriptive technique [17]. The following is the percentage of material validation results obtained in Table 1.

Tabel 1. Media Content Validation Results

No	Aspect	Quiz	%	Qualification
1	Information Content	8	66.6	Valid
2	Cognitive Content	7	87.5	Very Valid
3	Material	37	84	Very Valid
4	Instructional	8	100	Very Valid
Average Total			**83.3**	**Very Valid**

The results obtained mean that the material in the media is very feasible to use. Judging from the results of the data obtained, it shows that from the aspect of presentation, material information on the media is presented in a clear, coherent manner and users can use the media continuously. From the aspect of cognition content, the media is able to provide feedback to the user, and the score can be seen immediately after the user has finished working on the quiz.

Judging from the aspect of the content of the learning objectives conveyed in the media are presented clearly, the material contained is in accordance with KD and in accordance with the title of the material, the images loaded are in accordance with the material, the material and questions are presented in language that is easy to understand, the sentences used in the media are arranged in an orderly manner. effective and correct punctuation, the words used are in accordance with good and correct grammar and use terms that are easy to understand. Viewed from the instructional aspect, media can assist teachers in providing additional learning media and can help students increase their activity. According to Nuritta (2022) learning materials in a systematic and interesting order can increase the quality of learning and interest so that they can analyze material from the teacher and can think well in pleasant situations and can understand lessons [18].

After measuring the demand for learning after the use of interactive media content, it was found that the results of the pre-interest in learning the happy aspect got a result of 79.06% in the "High" category while the results of post-interest got a result of 89.69% with the "Very High" category. In this aspect, it increased by 10.63%. So, the analysis shows that students enjoy participating in 2D and 3D Animation learning, learn on their own accord using Interactive learning media, and are enthusiastic about learning using Interactive learning media. Interesting interactive learning media can generate enthusiasm for student learning [19].

The results of pre-interest in learning the aspect of interest got a result of 74.69% in the "High" category while the results of post-interest got a result of 86.88% in the "Very High" category. In this aspect there was an increase of 12.19%. So the analysis shows that students are interested in learning using learning media, do not feel bored when reading material on learning media, can focus on learning when using learning media, and students repeat material in interactive learning media to better understand the material. In line with Pramana's research, et al (2016) that the presentation of material in various forms not only in text but in the form of images and videos can attract students' learning interest [19].

The results of pre-interest in learning the aspect of attention got a result of 70.63% in the "High" category while the results of post-interest got a result of 86.25% in the "Very High" category. In this aspect, there was an increase of 15.62%. So that the analysis shows that students make the best use of interactive learning media by studying seriously, not getting sleepy when learning to use learning media, and learning material in the learning media before learning begins. In line with the opinion of Andriyani & Sunasih (2021) interactive learning media provides a wide variety of material variations for the needs of students according to their learning characteristics [20]. Can be seen in Figure 5.
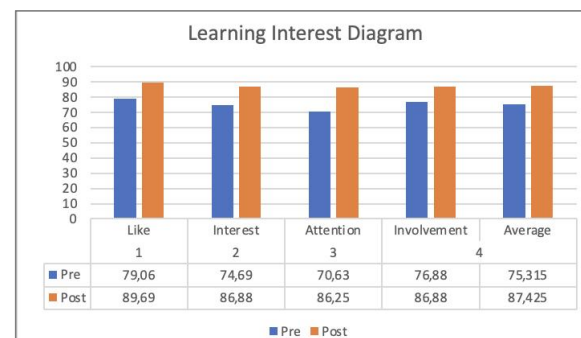

Figure 5 Learning Interest Diagram

The results of pre-interest in learning the involvement aspect got a result of 76.88% in the "High" category while the results of post-interest got a result of 86.88% in the "Very High" category. In this aspect there is an increase of 10%. So that the analysis shows that students can operate interactive learning media well, take quizzes, utilize the QR Code on learning media to find other sources of 2D and 3D animation material, and work on projects on learning media independently. In line with the opinion of Erwin & Yarmis (2019) the feedback provided by the media makes students aware of the consequences of their actions and students are encouraged to be active and interactive [21].

From the results of the analysis that has been detailed in each aspect of interest in learning, it shows that the use of interactive learning media can further increase students' interest in learning. The results of pre-

interest in learning showed a score of 75.31% and the results of post-interest in learning were 87.42%. The increase in students' learning interest before using interactive learning media and after using the media was 12.11%. There was a significant increase due to the provision of pre-interest and post-interest questionnaires at a considerable distance so that students had a greater opportunity to try interactive learning media at home independently. The use of learning media is an activity that can attract the desires and interests of students, provide motivation and stimulate learning activities, as well as have a psychological impact on students [22].

5. CONCLUSIONS

Research on Project Based Learning Interactive Learning Content resulted in several conclusions, including; (1). The media that has been successfully developed has gone through the stages of expert validation and product trials on vocational students; (2). The results obtained from the validation of material experts scored 83.33% with the qualification "very feasible", media experts scored 86.90% with the qualification "very feasible". (3). The results of the small group trial obtained a value of 85.24% with the qualification "very feasible", and the large group trial obtained a value of 88.87% with the qualification "very feasible"; (4). Students' interest in learning showed an increase of 12.11% in the very high category obtained from a pre-test score of 75.31% in the "very high" category and a post-test of 87.42% in the "very high" category. This shows that the content of learning media can increase the learning interest of vocational students and is effectively used as a medium in the teaching and learning process.

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