Jurnal Dinamika Vokasional Teknik Mesin
Vol. 09, No. 1, April 2024, pp. 68-74
https://journal.uny.ac.id/index.php/dynamika/issue/view/73640
ISSN: 2548-7590, DOI: 10.21831/dinamika.v9i1.73640

Google Sites: Development of 3D CAD Tutorial Video for Class XI at SMKN 1 Blitar

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Article Info

Article history:

Received Apr 25, 2024
Revised Apr 29, 2024
Accepted Apr 30, 2024
Published Apr 30, 2024

Keywords:

3D Drawing
ADDIE
Google Sites
Tutorial Video

ABSTRACT

This development research is using the ADDIE model (analysis, design, development, implementation, evaluation) with a quantitative approach. The discussion of the research results is limited to the development stage until the product feasibility validation test. The data collection instrument of this research is a questionnaire with a Likert scale (1-4). The development of 3D drawing video tutorial media using the ADDIE model provides good feasibility test results. This can be proven through the results of product validity tests on media experts with a percentage of 94.44% which means very feasible, on material experts with a percentage of 88.75% which means very feasible, and validity tests based on small-scale student responses with a percentage of 85% which means very feasible. These results indicate that the development of this 3D drawing video tutorial can be used in learning. Based on the overall percentage gain from the results of the product feasibility validity test, it can be said that the 3D drawing video tutorial media displayed through the utilization of the google sites platform is considered feasible to use in learning.

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INTRODUCTION

Education plays an important role for humans to be able to develop and prepare themselves when facing a problem (Alvianto et al., 2022). One of the education providers is a vocational high school (SMK). The implementation of education in SMK certainly continues to develop along with technological advances (Patmasari, et al., 2023). The involvement of technological advances is realized through digitization in the learning process (Andika et al., 2022).

The use of innovative learning media in computer aided design (CAD) learning in SMK is considered to make a positive contribution in supporting the digitalization of learning. Innovative learning media video tutorials are considered as a tool packaged by teachers or instructors as a form of new ideas in improving the acquisition of student learning outcomes (Nursyafti & Sukmawati, 2022).

The application of video tutorials in CAD learning in SMK is also considered as an effort to create conducive but not boring learning (Sawitri et al., 2023).

One of the CAD software used in machining engineering vocational schools is Autodesk Inventor. Autodesk Inventor is one of the software used for engineering design and drawing purposes (Wahyudi, et al., 2015). In Autodesk Inventor software, terminology contains several components, namely sketches or sketches, dimensions or dimensions, constraints or limits, basic features, and three-dimensional (3D) drawing features.

Based on the results of preliminary observations at one of the vocational schools, it was found that digitalization has not been fully utilized in CAD learning by students. Students tend to still use cell phones to access other things outside of learning material which has an impact on the acquisition of final achievement scores. This is certainly a special concern considering that CAD is a basic skill for vocational students that needs to be trained and developed comprehensively (Iswanda et al., 2020).

However, CAD variables are still general and do not specifically explain the core aspects of the material to be discussed in the study. Three-dimensional (3D) CAD drawing material becomes the core material in the focus of this research. The existence of three-dimensional (3D) CAD drawing learning with video tutorials packaged through google sites is considered to provide learning information quickly and easily accessible (Pratama et al., 2022). Learning through video tutorials packaged on google sites is also considered to make students more interested in learning (Suryana et al., 2023). In addition, learning CAD video tutorials through google sites can make it easier for students to repeat and listen to material independently (Zain et al., 2021). Therefore, this research focuses on developing a video tutorial learning media for three-dimensional (3D) CAD drawings integrated with google sites to improve the final grade achievement of grade XI students in CAD subjects.

METHOD

This research is a development research using the ADDIE model (analysis, design, development, implementation, evaluation) with a quantitative approach (Sugiyono, 2011). This research was conducted at SMK Negeri 1 Blitar in the competency of machining engineering expertise. The subjects of this study were students of class XI TPM SMKN 1 Blitar with a population of 68 students and a sample of 33 students. The data collection instrument for this research was a questionnaire. The questionnaire contains an assessment of the feasibility of video tutorials from material experts, media experts, and student responses using a Likert scale assessment guide containing 4 alternative answers, namely Very Good (4), Good (3), Less Good (2), and Not Good (1). The data obtained from the validation results by material experts, media experts, and student responses were then analyzed and calculated the percentage of feasibility using the following formula (Pratama et al, 2022):

$$\text{Percentage} = \frac{Score\ Obtained}{Maximum\ Score} x\ 100$$

After determining the percentage of feasibility, the value of product feasibility is determined through several criteria as shown in Table 1.

Table 1. Product Feasibility Assessment Criteria

Achievement (%)	Feasibility Classification
81-100	Very Feasble
61-80	Feasible
41-60	Moderately Feasible
0-41	Not Feasible

Sumber: Nabar et al, (2023)

RESULTS AND DISCUSSION

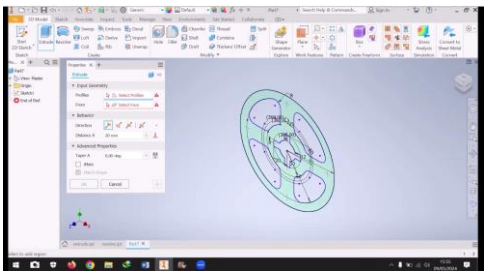
Results of Video Tutorial Media Development

In this study, the discussion is limited to the development stage until the product feasibility validation test. This is due to the limited time for product implementation and evaluation. The following are the stages to the results of video tutorial development using the ADDIE model. **The analysis stage**, namely: (1) analysis of student characteristics, (2) analysis of learning, and (3) analysis of facilities or environment at school. Based on the results of interviews with teachers in related schools: (1) student characteristics, the results show that students' abilities tend to be standard and tend to have learning styles that are mostly almost the same (visual and kinesthetic); (2) learning analysis shows that students have digitized in the learning process, but have not fully utilized technology according to learning needs. This can be seen when students are given an explanation of the material, students still tend to use cellphones to access other things that directly lead to video tutorials; (3) analysis of facilities or the environment at school found that it already has adequate facilities and also meets the aspects of digitalization, it's just that it is still not optimal in its application.

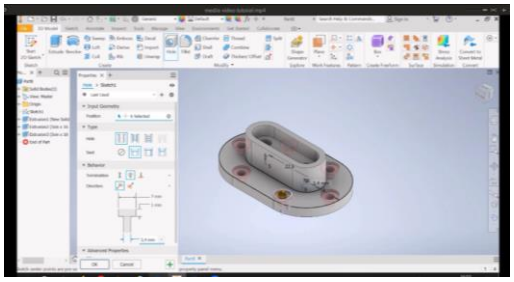
The activities carried out at this **design stage** include making learning scenarios and video tutorial scenarios which are used as guidelines in making products at the development stage. Then at this stage the selection of software used to develop the product is also carried out. The software used to develop material in video tutorial content is Autodesk Inventor. Combining media such as subject matter, animation, text, narration, audio and so on with the help of movie maker software so that the video tutorial becomes a complete media. **The development stage**, after the video tutorial has been made, the video will be used in learning through the google sites platform this activity is in the development process, the video content is combined into a unified whole according to the material, animation, text, narration, and audio. The results of media development are presented in Figure 1.

Google Sites display

Video cover display



display of video content



display of video content

Figure 1. Media Development Results

The implementation stage, activities at this stage include: (1) video tutorial media validation test based on aspects of design feasibility by learning media design experts (2); video tutorial material validation test based on material aspects and learning content by learning material experts; (3) small-scale student response trials, which aim to determine the level of feasibility and quality of the video tutorial media developed. The following are the results of the validity test to determine the level of product feasibility as shown in Table 2.

Table 2. Product Feasibility Assessment Results

Expert	Media Expert	Material Expert	Student Response
Total Score	68	71	170
Max Score	72	80	200
Percentage	94,44%	88,75%	85%
Criteria	very feasible	very feasible	very feasible

Based on the results of the product validity test given by media experts, the percentage obtained was 94.44% with very feasible criteria. Based on the results of the product validity test given by material experts, the percentage obtained was 88.75% with very feasible criteria. Based on the results of the product validity test by student responses on a small scale, the percentage obtained was 85% with very feasible criteria. The overall percentage obtained from the results of the product feasibility validity test, it can be indicated that the 3D drawing video tutorial media displayed through the utilization of the google sites platform is suitable for use in learning.

Discussion of Video Tutorial Media Development Results

The video tutorial packs the content of one meeting material into a video show that contains several sub-materials (not separate). The tutorial shown in this video is also more specific and directly refers to working on three-dimensional drawings according to the learning objectives. The content in this video is made relatively short but still conveys the core of the learning material. After the video content is created, the video is displayed on the google sites platform to make it more flexible to access.

Based on the results of the product feasibility validity test in the previous discussion, it can be stated that the 3D drawing video tutorial media through the google sites platform is feasible to use in learning. This is due to several factors, namely as follows. First, the development of 3D drawing video tutorial media with the ADDIE model is in accordance with the results of the analysis of learning media needs. The process of developing 3D drawing video tutorial media through the google sites platform with the ADDIE model also analyzes the feasibility level of 3D drawing video tutorial media products resulting from the development process. Siddiq et al. (2020) also explained that video media development using the ADDIE model is considered effective and able to assist the learning process of students and teachers.

The results of the product validation test in this study indicate that the video tutorial media is considered feasible to use in learning. Pratama, et al. (2022) also supported this opinion by stating that video tutorial media can help the implementation of the learning process as a whole and obtained a very good percentage (80%). Other research results by Zain, et al. (2021) also explained that the video tutorial media in autocad learning obtained a percentage of student response of 84% which means it is very feasible. Ponza et al. (2018) also explained that video tutorials that are designed in full including the appearance of writing (text), color images, audio (sound), and animation in one unit are considered to be able to provide a special attraction for students to learn through audio-visual presentation of material. In addition, learning supported by the use of video tutorials is considered to improve student learning outcomes (Marufah, et al., 2023).

Video tutorials that are packaged through google sites are considered to be able to facilitate students in gaining a good understanding of the material. The use of the google sites platform in 3D drawing material also makes students more able to maximize digitalization in learning. Patmasari et, al. (2023) also explained that the digitization of learning in SMK is important and is considered to be one way to create a pleasant learning atmosphere. The use of the google sites platform in learning is also considered to be able to help students to learn independently. Rosiyana (2021) in her research explained that the google sites platform is a practical tool because it can provide information that is easily accessible. In addition, the google sites platform can provide new colors to help students improve learning outcomes and make it easier for teachers to deliver learning (Yendrita & Syafitri, 2019).

CONCLUSION

Based on the previous explanation, it can be stated that the development of 3D drawing video tutorial media using computer aided design (CAD) with the ADDIE model provides good feasibility test results. This can be proven through the results of product validity tests on media experts (94.44%) which means very feasible, on material experts (88.75%) which means very feasible, and validity tests based on small-scale student responses (85%) which means very feasible. These results indicate that the development of this 3D drawing video tutorial is considered feasible and can be used in learning.

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