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The Development of CLO3D Software E-Module for Digital Creation of Party Attire Patterns And Designs

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Abstract

The implementation of Pattern Making learning is closely tied to exploratory understanding, aiming to produce digital patterns and designs for party attire in accordance with the desired theme. Limited book references and modules, along with the scarcity of teaching media, have led to a low level of student comprehension regarding the learning material. The objective of this research is to develop an e-module using CLO3D software for creating digital patterns and designs for party attire. This study follows the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) R&D development type. The instruments employed include a questionnaire to assess the e-module's levels of feasibility, practicality, and effectiveness. Feasibility testing data sources involve media experts and fashion material experts. Practicality testing data sources encompass fashion program teachers and 36 students from class XI at State Vocational High School 1 Pringapus. Effectiveness testing data sources consist of 36 students from class XI B1 as the experimental group and 36 students from class XI B3 as the control group at Vocational High School N 1 Pringapus. Based on the data analysis results, the feasibility testing yielded a score of 4.40 (criteria: very feasible), practicality testing resulted in a score of 92% (criteria: very practical), effectiveness analysis produced a score of 79% (criteria: effective), and the significance test analysis showed that the N-Gain_Persen obtained a Sig (2-tailed) value of 0.000 (smaller than the significance level of 0.05). This indicates that the data is effectively and significantly distributed, thereby confirming its suitability for use.

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INTRODUCTION

The development of learning media is crucial for teachers to enhance the quality and efficiency of instruction for both teachers and students. Various breakthroughs are necessary to improve the quality of education, encompassing development in teaching methods, curriculum, innovative learning approaches, and the provision of educational facilities (Supraptono and Setiawan, 2017). Especially in the pandemic era, teachers must be adept at gauging the situation to develop teaching materials suitable for students during both online and offline learning.

Vocational education is a dynamic educational level that consistently adapts its curriculum to match the changing job market and aligns with the advancements in science and technology (Muthia, Djuniadi, and Sudana, 2017). One teaching tool that aids educators in the teaching and learning process is the instructional module. Modules are designed to assist teachers in providing a learning experience that engages both mental and physical processes through interactions among students, students and teachers, the environment, and other learning resources, all with the aim of enhancing the expected learning outcomes (Zulaeha et al., 2021). Modules are highly suitable as a learning media for fashion design, serving as a supportive means to diversify and enhance the learning process, thus increasing student motivation to learn (Farkhatun et al., 2021).

The digital pattern content taught in class XI focuses on digital pattern-making and design. Initial observations from the previous year's data revealed that digital pattern instruction was still being conducted manually. However, in the present context, students seeking to learn digital patterns are required to source their own learning materials from video tutorials available on YouTube. YouTube and other social media platforms can be leveraged as learning resources due to the availability of social learning features on these platforms, which recommend high-quality, relevant educational content to users with limited experience using such platforms for learning (Zhou et al., 2020). Nevertheless, students have expressed difficulties in learning digital patterns solely through YouTube video tutorials. Many learners find digital pattern learning challenging, even after attempting to learn through video tutorials (Flavián, Ibáñez-Sánchez, and Orús, 2021).

The instructions for pattern creation and pattern assessment consume a significant amount of time, resulting in a suboptimal development of competencies required by students to delve deeper into the subject matter (Herdiningrum, Wahyuningsih, and Supraptono, 2021).

The decision to develop the CLO3D media is rooted in the desire to enhance the design capabilities of students in class XI at SMK N 1 Pringapus (*English*: State Vocational High School 1 Pringapus). Research by Alandia, Wilujeng, and Kuswanto (2019) has also demonstrated the effectiveness of interactive web-based learning media in fostering creative thinking abilities. The utilization of modules as learning media within the Fashion Computer Software course has shown positive outcomes in the learning process (Irmayanti and Hamidah, 2020). All modules provide a social environment that stimulates creativity, where learners engage in envisioning, exploring, experimenting, testing, manipulating, and speculating. For instance, five modules spanning physics, mathematics, and biology were chosen to monitor motivation and creativity (Conradty and Bogner, 2020). The outcome of this study is an e-module designed to employ the CLO3D media for the subject of digital patterns. The research's objective is to develop an appropriate and effective CLO3D e-module for the digital patterns subject, aimed at enhancing learning outcomes.

METHOD

This research employs an interactive media-based learning method within the framework of Research and Development (R&D), as R&D is a research method utilized to create specific products and assess the effectiveness of said products (Song, Wang, dan Zhang, 2020).

The research adopts the ADDIE model (Analysis, Design, Development,

Implementation, and Evaluation) as the developmental framework. This model serves as a generic instructional design model and guides the construction of effective, dynamic training programs and their supportive infrastructure (Anzoategui et al., 2019).

Below is the product development flowchart:

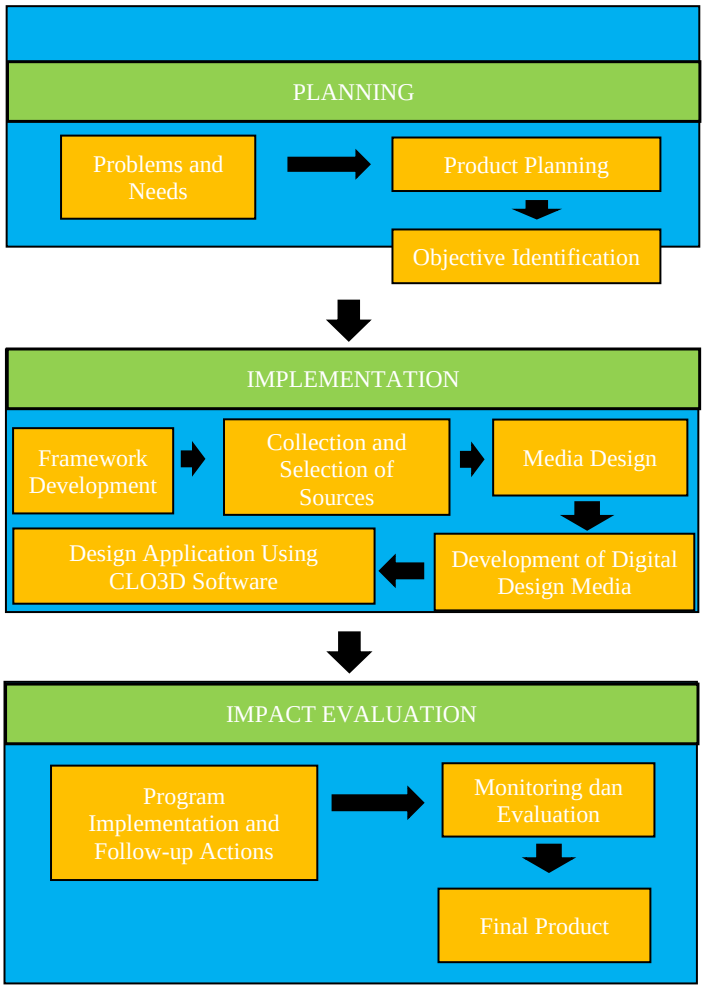

Figure 1. Product Development Flowchart

The instruments used in this research are (a) assessment sheets for the CLO3D e-module digital party attire design learning media; (b) basic design instruments derived from the use of the CLO3D e-module learning media, presented in the form of digital party attire designs.

The research was conducted from February 06 to April 03, 2023, at State Vocational High School 1 Pringapus. The data on the feasibility of the CLO3D e-module digital party attire design learning media were sourced from media experts and fashion material experts. The practicality data of the CLO3D e-module digital party attire design learning media were collected from users, namely students and fashion program teachers. The effectiveness data of the CLO3D e-module digital party attire design learning media were gathered from the experimental group (class XI B1) and control group (class XI B3) at State Vocational High School 1 Pringapus. The research utilized questionnaires as the data collection technique, including e-module feasibility questionnaire, e-module practicality questionnaire, and e-module effectiveness questionnaire.

1. E-module Feasibility Assessment Form

The e-module feasibility assessment form was conducted by 3 media experts and 3 subject matter experts. The researcher assessed the feasibility by distributing questionnaires as a research instrument to collect numerical data. In this context, the form of the e-module feasibility

assessment sheet used was a questionnaire comprising five options: strongly agree, agree, undecided, disagree, and strongly disagree.

2. E-module Practicality Assessment Form

The e-module practicality questionnaire was administered to 15 Fashion Program teachers and 36 students from class XI of Fashion Program 2 at State Vocational High School 1 Pringapus. Data collection involved providing the e-module, followed by data gathering through a 20-item questionnaire consisting of two options: agree = practical and disagree = not practical.

3. E-module Effectiveness Assessment Form

The e-module effectiveness assessment form was carried out with students from class XI of Fashion Program 1 and Fashion Program 3 at State Vocational High School 1 Pringapus. The researcher assessed effectiveness by comparing pre-test and post-test results between the experimental and control groups. The experimental group received treatment in the form of the e-module product, while the control group did not. In this context, the form of the e-module effectiveness assessment sheet consisted of multiple-choice questions, utilizing a total of 35 questions from the e-module.

In order to determine the validity and reliability of the scales used in the research, it is necessary to conduct testing on the instrument items. This testing aims to assess whether the formulated questions are comprehensible to the research subjects, validate each item, and examine the condition of the research instrument being used.

1. Validity and Reliability Testing of Instruments

To ascertain the validity or accuracy and reliability or consistency of the scales employed in the research, it is necessary to conduct testing on the instrument items beforehand.

a) Validity and Reliability Testing of the Feasibility Assessment Instrument for the CLO3D E-Module Digital Party Attire Design Media.

The feasibility assessment of the e-module used in this research was initially subjected to a pilot test to examine its validity. For the validity and reliability testing of the feasibility assessment instrument, the following validity and reliability tests were employed:

(1) Validity

The validity was assessed using a Likert scale scoring method. An instrument is considered valid if its Content Validity Ratio (CVR) testing yields a value above 0.99. If the number of valid items does not meet the target of $r \geq 0.98$, the obtained value is compared to the minimum value with the number of experts used. Based on the data analysis conducted by media experts and subject matter experts, the CVR score was 0.99. This analysis indicates that the Feasibility Assessment Instrument for the CLO3D E-Module Digital Party Attire Design Media is valid.

(2) Reliability

The reliability test employed in this research was inter-rater reliability. Based on the data analysis conducted, the results show no significant differences in assessments among raters ($p > 0.05$). Additionally, the outcome of the ICC analysis indicates satisfactory inter-rater reliability, with $rxx = 0.075$. This suggests that the developed feasibility instrument is both convincing and reliable for use.

b) Validity and Reliability Testing of the Practicality Assessment Instrument for the CLO3D E-Module Digital Party Attire Design Media.

(1) Validity

The validity was assessed with responses scored on an interval/ratio scale. The formula used to calculate the point-biserial correlation coefficient for the Practicality Assessment Instrument for the CLO3D E-Module Digital Party Attire Design Media was employed. Based on the conducted analysis, the significance value of the practicality instrument items was identified using the point-biserial correlation coefficient. Out of the 20 item questions, those with scores > 0.05 resulted in 17 valid items and 3 items were deemed invalid.

(2) Reliability

The reliability is used to indicate that a questionnaire can be trusted as a data collection tool, as the practicality questionnaire is already satisfactory. Based on the conducted analysis, a reliability score of 0.462 was obtained. This score can be interpreted as falling within the 'moderate' category.

c) Validity and Reliability Testing of the Effectiveness Assessment Instrument for the

CLO3D E-Module Digital Party Attire Design Media.

(1) Validity

The validity was assessed with responses scored on an interval/ratio scale. The formula used to calculate the point-biserial correlation coefficient for the Effectiveness Assessment Instrument for the CLO3D E-Module Digital Party Attire Design Media was employed. Based on the validity test analysis of the effectiveness instrument, out of 25 response items, 22 items were found to be valid, while 3 items were not valid.

(2) Reliability

The reliability is used to demonstrate that a questionnaire can be trusted as a data collection tool, indicating that the effectiveness questionnaire is already good. From the item analysis, the reliability of response items was obtained as 0.956, which is greater than the table value of 0.329. It can be concluded that the response items are highly reliable based on the criteria.

(3) Level of Difficulty

The level of difficulty of a question refers to the test's ability to capture the number of test subjects who can correctly answer the question. Based on the analysis results, the level of question difficulty is as follows: easy criteria with 0 questions, moderate criteria with 15 questions, and difficult criteria with 10 questions.

(4) Discrimination Index

Item Discrimination Analysis is the ability of a question to differentiate between proficient and less proficient students. In this research, the formula for biserial discrimination is employed. From the analysis of item discrimination, it was found that 1 questionnaire item had weak discrimination, 2 items had fair discrimination, 1 item had good discrimination, and 21 items had very good discrimination.

2. E-Module Feasibility Analysis

The module feasibility analysis technique is conducted through quantitative descriptive analysis. The data for module feasibility analysis are obtained directly using response questionnaires from expert validators, including subject matter experts who are teachers and lecturers in the field of fashion design, as well as media experts from the Education and Culture Multimedia Development Center (*Indonesian*: *Balai Pengembangan Multimedia Pendidikan dan Kebudayaan*, BPMPK).

3. E-Module Practicality Analysis

The data from the e-module practicality analysis consists of response questionnaires from student validators. Subsequently, the coefficient of reproducibility (*Indonesian*: *Koefisien reproduksibilitas*, Kr) and the coefficient of scalability (*Indonesian*: *Koefisien skalabilitas*, Ks) are calculated to determine the practicality of each aspect.

4. E-Module Effectiveness Analysis

The obtained data first undergo preliminary analysis tests including tests for normality and homogeneity. Once it's determined that the data is normally distributed and homogenous, the next step is to calculate the N-Gain from the data to assess the effectiveness of the intervention. The final step involves testing this N-Gain using an independent t-test to determine the significance of the difference in the average N-Gain between the experimental and control groups.

RESULT AND DISCUSSION

1. Results of Research and Development Using the ADDIE Model

a) Analysis

In this phase, the conducted activities involved conducting a needs analysis and a module needs analysis for learners using CLO3D software in achieving the learning objectives of digital party attire pattern-making and design. The analysis phase is a stage of information collection that serves as a basis for creating a product. In this case, the product produced is the CLO3D software e-module aimed at enhancing learning outcomes in digital party attire pattern-making and fashion design for the 11th-grade fashion students at State Vocational High School 1 Pringapus.

b) Design

The second phase of the ADDIE development model is the design phase. The design phase is carried out to facilitate the researcher in designing the e-module to be developed. The design phase includes structuring

the e-module framework, gathering and selecting references, designing the e-module layout, and composing response instruments.

c) Development

This phase aims to assess the feasibility of the designed media. As a follow-up to the design conducted in the design phase, the development steps are as follows: (1) Development of the e-module for creating party attire using CLO3D software, utilized in the creation of party attire patterns and designs; (2) Validation by media experts, subject matter experts, and user feedback (teachers and students), as well as validation of the e-module's effectiveness. This stage is performed to determine the feasibility of the developed e-module. The media feasibility test is conducted to gather suggestions and critiques from validators regarding the developed product. This is evidenced by the completion of response questionnaires that indicate the media's suitability for the research; (3) E-module revision. The media that has been validated by validators, including media and subject matter experts, is subsequently revised according to the notes, critiques, and suggestions provided in the supporting statements. In this case, the supporting statements are provided solely by media and subject matter experts, with each group consisting of 3 experts; (4) Development of validation, practicality, and effectiveness assessment instruments for using the CLO3D software e-module for creating party attire. The development of scoring instruments will be based on the criteria for a good e-module media tool. Additionally, user response questionnaires will be developed. These user response questionnaires will be tailored to the criteria for a good e-module media, drawing from several validated feasibility, practicality, and effectiveness questionnaires.

d) Implementation

The fourth stage of the ADDIE research and development model is the implementation stage. (1) Pre-test for the experimental and control groups. The first step in implementation is administering a pre-test to both the experimental and control groups to assess the initial condition of the respondents before any treatment is applied; (2) Conditioning. In this research, conditioning refers to preparing the respondents (experimental and control groups) after the pre-test. Respondent conditioning involves providing treatment in the form of using the CLO3D digital party attire design e-module, which is currently being developed, to the 11th-grade Fashion 1 students after they have taken the pre-test, constituting the experimental group. Meanwhile, the 11th-grade Fashion 3 students serve as the control group and are not given the treatment involving the use of the CLO3D digital party attire design e-module; (3) Post-test for the experimental and control groups. The final step in testing the effectiveness of the CLO3D digital party attire design e-module is by administering a post-test.

e) Evaluation

The final stage in this research and development process is the evaluation stage. In this stage, improvements will be made to achieve a better system by processing the data obtained from the previous stages that have been carried out. This evaluation takes place after the completion of the previous four stages in the ADDIE model. (1) The formative evaluation stage aims to determine the feasibility of the media created and assess the extent to which the designed CLO 3D digital party attire design e-module can function. It also identifies obstacles. By understanding the obstacles and factors that hinder the smooth implementation of the CLO 3D digital party attire design e-module, early decision-making can support the smooth achievement of research objectives; (2) The summative evaluation stage aims to determine the effectiveness of using the CLO 3D digital party attire design e-module. Summative evaluation leads to decisions regarding the achievement of the statement that the CLO 3D digital party attire design e-module improves learning outcomes. Summative evaluation is also used to determine the continuation of the research, whether to stop or proceed with the research, adopt, and further endeavors.

2. The Feasibility of the E-Module

Based on the data analysis, it can be observed that the overall average is 4.40 with a criterion of very feasible. Therefore, the CLO3D digital party attire design e-module is deemed

valid and highly suitable for enhancing learning outcomes.

3. The Practicality Test of the E-Module

Based on the data analysis, with a score of $\bar{x}$ = 92%, as the overall average score corresponds to the practicality level tabulation, user responses fall within the range of 75%-100%. This indicates that the CLO3D digital party attire design e-module is considered very practical for enhancing learning outcomes.

4. The Effectiveness Test of the E-Module

Based on the data analysis, the significance score (Sig) in Levene's Test for Equality of Variances is 0.773 > 0.05, indicating that the variance of the N-Gain (%) data for the experimental group and the control group is equal or homogeneous. From the calculation, the calculated T-value for N-Gain_Persen is 7.737, and the critical T-value for (df(n-k) = 34; α = 5%) is 1.69092. As the calculated T-value is greater than the critical T-value, it can be concluded that prior to being treated with the use of the CLO 3D digital party attire design e-module, there was no difference in the conditions between the two classes, XI Busana 1 and XI Busana 3, at State Vocational High School 1 Pringapus.

CONCLUSION

The final product of developing the CLO3D digital party attire design e-module using the R&D approach with the ADDIE model has been achieved. After a series of testing, it can be concluded that the e-module for CLO3D digital party attire design has become the final product. In the expert validation phase, it was determined that the e-module is highly suitable for student use in improving learning outcomes. In the N-Gain test, it was concluded that the CLO3D digital party attire design e-module is moderately effective for students to enhance their learning outcomes. The t-test also indicated a significant difference in using the e-module to improve learning outcomes for students.

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