Ibis Paint X Module Development to Improve Students' Competency in Digitally Designing Daily Wear Fashion Designs for the Gen Z Era

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Article Info

Abstract

Development digital technology has become imperative in the world of industry and education, demands adaptation curriculum School Intermediate Vocational (SMK) to be able to produce source Power human beings who have competence in accordance the needs of the world of work, especially in fashion design field. Learning conventional which tends to theoretical need innovation with utilise technology digital -based for create a more effective learning process active, creative, and relevant with style life of Gen Z. Therefore that, research This focus on four objectives main: (1) Produce module-based Ibis Paint X application with draft mood board for design fashion digital ready-to-wear; (2) Analyze level eligibility module; (3) Analyze level practicality module in context of learning model Problem-Based Learning (PBJL); and (4) Analyzing effectiveness module in increase ability increase competence student in manufacturing design fashion daily wear era gen z digitally.

Study This use approach Research and Development (R&D) with adopting the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). Subject study is vocational school students in the subject lesson design fashion. Data analysis includes feasibility tests, practicality tests, and effectiveness tests. use N-Gain Score and statistical test t-Test N-Gain Score. N-Gain is related with increase competence student in manufacturing design fashion Daily wear in the Gen Z era digitally. Reliability test results to evaluation eligibility modules by experts' material get mark of 0.898. Validation results expert show that developed modules is in the very appropriate category, confirms suitability content and construction module in a way academic. Practicality test in PBJL implementation shows very practical category. More further, the results of the effectiveness test prove that Ibis Paint X module is very effective in increase competence student in manufacturing design fashion daily wear era gen z digitally. This is supported by the acquisition N-Gain value of 81% (category effective) and the results of the t-test show Sig. value (2-tailed) of $0.000 < 0.001$, which is far smaller from level significance of 0.05. This result confirms existence improvement competence student in manufacturing design fashion daily wear era gen z digitally significant after use module.

INTRODUCTION

School Intermediate Vocational (SMK) is level education medium vocational For coaching skills life or skills life in formal education in Indonesia. Schools Intermediate Vocational (SMK) has different characters with other formal schools . The aim of vocational schools is prepare participant educate to be ready Work with expertise in the field certain . Therefore that , vocational school graduates are ready entering the world of work with acquired skills during the learning process at school .

Quality learning is one of the effort in improvement quality of educational programs . Emphasis main For repair quality education namely in the learning process teaching at school . Teachers need prepare for the learning process good teaching with utilise technology information and communication so that capable awaken motivation Study students . Conditions This also targets teachers who teach at schools. Intermediate Vocational (SMK), especially moment This vocational school is under shade Directorate Directorate General (Directorate General) of Vocational Education .

Existence Directorate Director General of Vocational Education aim For prepare source Power ready man use facing the era of the Industrial Revolution 4.0 which requires forces skilled expert in his field . In order to be able to Work in a way effective and efficient as well as capable develop expertise and skills , participants educate must control field his skills and fundamentals knowledge knowledge and technology , have ethos high and capable work communicate in accordance with demands work as well as own ability develop self .

Change following material morality curriculum , encourage student more integrity in prepare self will growing industry in line with development technology . Therefore that , ability control learning materials design fashion or make design fashion with use something digital tools as a medium for can visualize existing ideas application - based drawing , where the design process clothes , now more Lots use digital devices based on application drawing on digital . Interesting use of media in the learning process can can facilitate the process of understanding

Study so that achievement of goals teaching (Iryani, 2020).

One of teaching materials that can assist teachers in the learning process teach is in the form of module learning . Teaching materials in the form of designed modules For assist teachers in give experience learning that involves mental and physical processes through interaction between participant students , participants educate with teachers, environment , and resources Study other in frame achievement expected competencies . (Anggraini & Sukardi, 2016:24-30) .

Module is one of the form packaged teaching materials in a way complete and systematic , in it load a set experience planned and designed learning For help participant educate control objective specific learning (Rahdiyanta , 2016). Learning module is A designed and written book with the aim is for students can Study in a way independent without or with guidance lecturer Because module can studied anywhere . In addition , according to (Abi Hamid, 2017:149-157) the module learning is a series activity systematic learning based customized curriculum with desired competencies achieved .

The use of Ibis Paint X media is expected can add ability design and creativity student Class XI Fashion Design, State Vocational School 1 Pringapus . The results of the study (Rachmawati, 2020: 540-550) also prove that that use of learning media interactive effective web- assisted in develop ability think creative . One of the how to make the material taught by the lecturer No easy forgotten by students that is with using media as tool help learning . Modules used as a learning medium in eye studying Application Fashion Design Computer provides impression positive in learning (Irmayanti, 2020:38-48). From both study the so researchers try For combine between utilization of digital- based media that uses guide learning in the form of module .

A number of problems faced in the learning process design fashion is : the minimum approach personalized learning in design fashion digital ; Feed come back in the design process that is lacking deep and not specific ; Teacher limitations in monitor the development process design in

terms of ; teacher limitations or instructor in mastery technical Ibis Paint X application .

Based on description background behind above , then the problem you want revealed in study This is : 1) How develop Ibis Paint manufacturing design digital daily wear fashion of the Gen Ze era ; 2) How eligibility Ibis Paint manufacturing design daily wear fashion of the gen z era; 3) How practicality Ibis Paint X module in manufacturing design digital daily wear fashion of the Gen Z era in the design subject fashion with the Project - Based Learning (PJBL) learning model ; 4) How effectiveness Ibis Pint X module in manufacturing design fashion with daily wear of the Gen Z era digitally for increase skills student through the Project-Based Learning (PJBL) learning model .
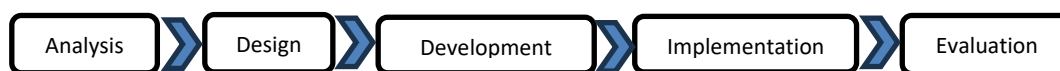
Figure 1. Stages of the ADDIE development model

METHOD

Research methods used in study This use type study development or Research and Development (R&D). Research development is approach study Which used For produce product certain and test effectiveness product (Sugiyono , 2016). Research and development model (*research and development R&D*) functioning For help produce product new in the form of module Which used as guide Study student in use application *Ibis Paint X* on eye lesson design fashion competence base make fashion *Daily Wear in the Gen Z Era* in a way digital with draft collage .

Media development design in study This adapted from the development model *ADDIE* which consists of of five stages development that is *Analysis , Design, Development, Implementation, Evaluation* (Alodwan, 2018:43.) Research development education covering development process , validation product , trial product , and evaluation . The ADDIE model is a product development model oriented class . Development model ADDIE identical with development system learning . The development process sequentially However interactive , namely evaluation every stage can used For development to stage next . Stages development module with the ADDIE development model

The ADDIE model is used as procedure development of learning media in the form of module use application Iibis paint x on the eyes lesson design fashion For material manufacturing design fashion *Daily Wear in the Gen Z Era* digitally . Research This conducted at State Vocational School 1 Pringapus with subject study class XI Fashion Design 1 totals 34 students . Instrument trial response student taken in class XI Fashion Design 2 while for trial evaluation *The performance test* was conducted at SMK Negeri 1 Widya Praja Class XI Fashion Design 1 consists of 34 students . Engineering collection data is step Which most strategic in study , Because objective main from study is gather data (Sugiyono, 2014). Study This use sheet evaluation as technique data collection , namely instrument eligibility module , questionnaire practicality module , sheet evaluation *performance test* For measure effectiveness module , sheet evaluation creativity students and questionnaire For evaluate practicality module

As for stages in study development model ADDIE that is analysis needs , design , development , implementation And evaluation explained following :

Stage Analysis

Analysis is step beginning in carry out study Which used as reference in formulation problems and sharpening focus study based on empirical data in the field with carry out activity observation and interviews . Activities carried out in stage *analysis* Which covers analysis need And analysis need module learning For student student in use Ibis Paint X application on competency base make fashion *Daily Wear Era Gen Ze* in a way digital with draft mood board;

Stage Design (Design)

In this design stage researchers start learning that will developed . There are 4 steps in

the stage design This , among them compilation framework collection And election reference design module and preparation of instruments with module . At this stage This prepare the lesson plan used as guidelines in implementation module in learning . The results of the design that has been made consulted with expert in the fashion sector, if design Already approved so step next that is realization design module Which has approved ;

Stage Development (Development)

Stage development in research this , the first one will developed module use application Ibis Paint X in Vocational School Country 1 Pringapus , stage This aim For see to what extent eligibility module Which Already designed ; Then after module developed furthermore module submitted on validator Which consists of from expert media, expert material , And response users module (teacher and student). The validator consists of from Media Experts and Material Experts consisting of from teachers and practitioners design ;;

Stage Implementation

Activities carried out in stage This in the form of implementation module used as guide Study student in use application Ibis Paint X on competence base make fashion *Daily Wear Gen Ze Era* digitally with mood board concept . At this stage This module learning applied in the learning process that has been designed such appearance in accordance at the stage development . Trial reliability and practicality . At this stage This obtained data about practicality product according to criticism , suggestion, and input as well as data results observation Which used For base revision product media learning in the form of module . *Respondents is student class XI Tata Fashion Vocational School Country 1Pringapus with give pretest* before given treatment And *posttest* after given treatment .

Stage Evaluation

Stages evaluated in stages This is differentiated into two evaluations , namely evaluation formative and evaluation summative (Selegi , 2017). Evaluation formative in research This that is related test eligibility And practicality

module And evaluation summative relation with test effectiveness module . In stage evaluation , data Which obtained analyzed For know lack from module Which want to made , data results evaluation in the form of suggestion And questionnaire .

RESEARCH RESULTS AND DISCUSSION

Research result

Study This using the *Research and Development* (R&D) model with ADDIE (*Analysis, Design, Development, Implementation, and Evaluation*) procedures for generate *Ibis Paint X* Module based *Project-Based Learning* (PJBL). Research results covers three stages Main : (1) Module Feasibility Test , (2) Module Practicality Test , and (3) Module Effectiveness Test in increase competence student .

1. Module Development Results

Products produced in study This is digital module based Ibis Paint X application . The modules are arranged with integrate draft *mood board* as step beginning design fashion *daily wear* . Material in module covers introduction feature applications , techniques digital coloring , up to manufacturing proportion body and clothing details . This module designed visually to fit with characteristics Gen Z's modern and minimalist aesthetic .

2. Module Feasibility Test Results (Expert Validation)

Feasibility test module done by experts materials and media experts for ensure suitability content and construction module before implemented in the field . The results of the feasibility test show that developed modules own high quality .

a) Subject Matter Expert Validation Obtained The average score was 4.62 (Very Eligible Category). The expert emphasized that depth material Already in accordance with Fashion Design Vocational School curriculum .

Calculation Results	4.42	4.47	4.50
Average	4.462		
Criteria	Very Feasible		

b) Media Expert Validation : Getting The average score is 4.78 (Very Adequate Category). Assessment covering aspect readability , quality images , and convenience navigation digital module.

Calculation Results	4.8	4.8	4.7
Average	4.7		
Criteria	Very Feasible		

c) Reliability Test : Reliability test results to evaluation eligibility modules by experts material obtained mark of 0.898. This value indicates that instrument evaluation eligibility own excellent internal consistency .

With results this , it is concluded that in a way academic and construction , Ibis Paint X Module Gen Z Era has fulfil required standards as appropriate teaching materials used in Digital Fashion Design learning .

3. Practicality Test Results of Module (PJBL Implementation)

Practicality test done at the time module implemented in learning with the Project-Based Learning (PJBL) model in class experiments , which involve response from teachers and students as users module .

Practicality test results show that very practical module in implementation of PJBL. This supported by various response positive users (teachers and students) who assess that module: Implementation Results (Practicality Test). Own clear and coherent material , very relevant with need industry creative , especially design fashion digital, use Ibis Paint X application is enough practical Because can accessible through mobile devices (smartphones), allowing student learn and practice When anywhere and anytime . with characteristics Generation Z tends to be visual and digital-native.

a) Reproducibility Coefficient Test Results

Scale of Reproducibility coefficient (Kr) of the results analysis in study This is 0.899 which can be rounded to 0.9, which is the category considered good , because Kr score =>0.90 (Singirimbun et al (2014).

b) Scalability Coefficient Test Results

This value show that module This own level sufficient scalability good . This is in accordance with Likert's theory (1932), which states that effective instruments must can handle difference level ability participant with give appropriate questions with various level existing capabilities . A value of 0.779 indicates that instrument This can differentiate participant with ability low , medium , and high with Enough well , though Still There is room For repair discrimination question For participant with ability low .

4. Results of the Module Effectiveness Test (Improvement Competence)

Effectiveness test done with Pre-test and Post-test methods for measure improvement competence student in manufacturing design Gen Z era daily wear fashion digitally after use module .

a) N-Gain Score Results

Average Value: Occurs improvement significant from average *pre-test* score by 65.4 to 86.8 in *the post-test* . The calculation results show that the average N-Gain of the experimental class is 81% **,** while the control class is 47% **.** Based on the N-Gain interpretation criteria (Hake, 1999), N-Gain values between 70%–100% are included in the high category **,** while values between 30%–70% are included in the medium category. Thus, the increase in learning outcomes in the experimental class is classified as high **,** while the increase in the control class is only moderate**.**

79.7	Effective	48.0	Less effective
79.7	Effective	52.1	Less effective
77.9	Effective	42.9	Less effective
85.1	Effective	48.9	Less effective
85.1	Effective	48.5	Less effective

Source: 2025 research data.

b) Statistical Test Results t-Test

A t-test was conducted to determine whether there was a difference in learning outcomes (N-Gain) between the experimental class using the developed learning module and the control class using conventional teaching materials. The test results were analyzed using SPSS version 30.0.

Table 4. t-Test Results

Group Statistics

x1		N	Mean	Std. Deviation	Std. Error Mean
y	eksperimen	33	81.1818	4.61962	.80417
	kontrol	33	46.6970	4.31194	.75061

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
y	Equal variances assumed	.166	.685	31.348	64	.000	34.48485	1.10005	32.28724	36.68245
	Equal variances not assumed			31.348	63.698	.000	34.48485	1.10005	32.28704	36.68265

Source: 2025 research data.

Based on results analysis in Table 4.10 above , obtained Sig. value (2-tailed) is 0.000 < 0.001, which means more small from level significance of 0.05. This is show that there is significant difference between results Study students in class experiments and classes control . With thus , it can concluded that use module learning in a way significant more effective in increase results Study participant educate compared to with learning use conventional teaching materials .

2. Discussion

Development module based this Ibis Paint X application is response to need digital transformation in the environment School Intermediate Vocational (SMK), especially in competency fashion design expertise . Research results show that integration digital technology through structured modules capable bridge gap between learning conventional with demands industry modern creative all-round fast . Usage Ibis Paint X application selected Because its high accessibility via smartphone, which allows student For Study in a way flexible without device dependency expensive computer .

Validation by experts materials and media provide justification academic that module This is in the very worthy category For implemented . The height score eligibility This driven by systematics coherent presentation , starting from introduction tools up to technique manufacturing complex design like draft *moodboard* . Findings This in line with principle development teaching materials that must be fulfil standard eligibility content , presentation , and language to support

effectiveness of knowledge transfer to participant educate .

Aspect practicality modules assessed by educators and students show very positive results , where the module considered make it easier instructions Work in the learning model *Project-Based Learning* (PjBL) . PjBL in context This give room for student For experiment with design fashion relevant daily *wear* with Gen Z trends , so the learning process become more contextual and meaningful . Practicality this is also visible from ability student in operate features application in a way independent only with follow guide step by step in module .

Analysis effectiveness through the *N-Gain* test prove existence improvement significant on competence student after use module . Improvement score between *pre-test* and *post-test* show that intervention through more digital modules superior compared to with method learning conventional which tends to theoretical . Success This indicates that digital visualization through application capable strengthen understanding cognitive and skills technical student in designing fashion in a way precision .

Response student to module This reflect Gen Z characteristics that are *digital-native* , where they feel more motivated moment Study use familiar device with daily life they . View modern and interactive modules capable maintain attention student longer than book static text . High motivation This in a way No direct impact on trust self student in produce work original and not just copy example from the teacher .

Although show superior results , research This take notes importance the role of teachers as facilitator in direct use features complex on Ibis

Paint The module works as guide main , but permanent teacher assistance required For give bait come back critical to aesthetics and anatomy the resulting design students . Collaboration between independent teaching materials and appropriate teacher guidance become key optimization competence design digital fashion .

Research result show that *the Ibis Paint X* Module was developed fulfil four indicator quality of learning media that is validity , practicality , effectiveness , and activity students —who are component important in development of educational media based on the ADDIE model. Fourth indicator This required For ensure that the media is worthy applied to learning vocational in vocational schools.

1. Feasibility and Practicality of Modules as Digital Learning Solutions

Feasibility test (Very Feasible) and practicality (Very Practical) of the module confirm that module This can become the right solution For overcome problem Fashion Design learning in vocational schools. This module answer need urge will structured and adaptive teaching materials to development technology , according to with demands of the world of work in the Industrial Revolution 4.0 era . Selection Ibis Paint X application is proven appropriate Because considered user-friendly, has feature complete , and can accessible through smartphone devices , which are owned almost all over Gen Z students . Flexibility This facilitate student For learn and practice in a way independent (self-regulated learning) when anywhere and everywhere , which was previously constrained by limitations device computers and time studying in school . The use of digital media such as Ibis Paint proven effective increase creativity and results Study students in the field design fashion .

2. Effectiveness of Module in Improvement Competence Student

strongest evidence from study This is effectiveness test results , namely acquisition N-Gain value 81% (Category Effective) and Sig. value of 0.000 from the t-test. This figure prove that the Ibis Paint X Module is not merely a complementary medium , but rather tool very effective learning in increase competence practical student in designing digital fashion .

Improvement significant competencies This can associated with a number of factors :

- Structure and Model: This module integrated with the Project-Based Learning (PJBL) model which allows student involved active in project real , start from manufacturing mood board until design end . This process facilitate student Study in a way gradual and structured , overcoming habit copy images that occur during learning conventional .
- Focus : This module in a way specific focuses on Gen Z daily wear design . Segmentation material This make learning become more contextual , interesting , and relevant with style life as well as trend contemporary students , so that increase motivation and creativity they .

Findings This in line with study previously stated that Module development and use *Ibis Paint X* give contribution positive in increase quality learning and competence digital design of vocational school students . With Thus , the module This succeed bridge gap between competence vocational school graduates with demands industry increasingly digital fashion developing . In overall , development this Ibis Paint X module give contribution real for development adaptive curriculum at Fashion Design Vocational School to revolution Industry 4.0 . Research results This recommend use digital modules in wide For increase Power competition vocational school graduates in the job market creative . Innovation This prove that limitations facility laboratory computer can overcome with utilization intelligent and integrated mobile technology in learning .

CONCLUSION

Study development This has succeed validate , test practicality , and testing the effectiveness of the Ibis Paint X Module based on Project-Based Learning (PJBL) for increase competence student in manufacturing design Gen Z era daily wear fashion digitally . Key conclusions from study This is :

1. Research and development of Modules on the material this Ibis Pint X application using the ADDIE model. Stage development consists of of five stages , namely (1) stage analysis includes analysis curriculum , analysis teaching materials , analysis facility supporters , analysis condition educators , and conditions participant educate ; (2) stage design (design) loading framework module learning that contains specification modules , flowcharts , story boards, and compilation instrument validation module ; (3) stages development consists of from manufacturing module , validation modules by media experts and experts materials and repairs or revision module based on suggestions from media experts and experts material . In addition That tested practicality by friends colleagues educator colleagues from study program fashion design vocation ; (4) stages implementation includes giving pre-test in class experiments and controls , trials use module material Ibis Pint X application in class experiments , and giving post test in class experiments and controls ; and (5) stages evaluation consists of from evaluation formative used For know need participant educate to the latest teaching materials , module testing by expert validators , and practicality testing modules by educators on the material Ibis Pint X app ;

2. Modules on the material Ibis Pint X application which has developed worthy used , as well as can be implemented For participants educate in the learning process material application Ibist Paint X. Module on the material application Ibist Pint X which has been developed worthy used , as well as can be implemented For participant educate in the learning process material Ibis Pint X app ;

3. Modules on the material Ibis Pint X application which has developed practical used ; and can be implemented For participant educate in learning material Ibis Pint X app ;

4. N-gain on class control including category No effective , whereas in the group experiment including in category effective . With thus can it is said that module Ibis Pint X application implemented in learning its effectiveness tall

in increase ability cognitive on elements informatics Ibis Pint X app .

In a way Overall , the Ibis Paint X Module is solution innovative , valid, practical and effective For increase quality learning and competence design digital fashion in schools Intermediate Vocational (SMK), in particular in context relevant daily wear designs with Gen Z.

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