ACCURATE ONLINE E-MODULE IN COMPUTER ACCOUNTING COURSE

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ABSTRACT

This study aims to develop valid, effective, accurate online e-module teaching materials as an alternative solution to the problem of limited resources for accurate online computer-based subject learning in the accounting field. This research and development utilized the 5-stage ADDIE model. The data collection techniques used were interview guides, expert validation forms, and restricted users and testing. The participants of this study include several accounting teachers and students, one media expert, two material experts, eight limited-user students, 35 students in the experimental class, and 33 students in the control class. The results show that the precise online electronic module received 98% from media experts, 95% from material experts, and 95% from limited users. Therefore, the E module is suitable for use in teaching. The significance of the T-test result indicating that the E module effectively improves accounting computer learning effects.

Keywords: E-Module; Computer accounting; Accurate online (AOL)

ABSTRAK

Studi ini dimaksudkan untuk mengembangkan bahan ajar e-modul Accurate Online sebagai alternatif solusi atas permasalahan keterbatasan sumber belajar pada mata pelajaran komputer akuntansi berbasis Accurate Online yang tervalidasi dan efektif. Penelitian dan pengembangan ini menggunakan model pengembangan ADDIE dengan 5 tahapan penelitian. Teknik pengumpulan data yang digunakan yakni pedoman wawancara, lembar validasi ahli dan pengguna terbatas, serta tes. Subjek penelitian ini terdiri atas beberapa guru dan siswa jurusan Akuntansi, seorang ahli media, dua orang ahli materi, delapan siswa sebagai pengguna terbatas, 35 siswa bertindak sebagai kelas eksperimen dan 33 siswa sebagai kelas kontrol. Hasil penelitian diperoleh bahwa e-modul Accurate Online mendapat nilai 98% dari ahli media, 95% dari ahli materi, dan 95% dari pengguna terbatas. Sehingga e-modul dikatakan layak untuk digunakan dalam pembelajaran. Sementara hasil uji T menunjukkan bahwa e-modul efektif untuk meningkatkan hasil belajar komputer akuntansi.

Kata Kunci : *E-modul; Komputer akuntansi;* Accurate online (AOL)
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INTRODUCTION

Blended learning is a form of technological advancement that has begun to be widely implemented in learning activities (Istiningsih & Hasbullah, 2015). This model connects synchronous and asynchronous learning by integrating technological developments (Anis Chaeruman et al., 2018). Blended learning claims not only to enrich the learning process in schools but also to design a learning atmosphere with more freedom for learners (Lai et al., 2016; Kim et al., 2016; Smith & Hill, 2019). Learners can decide what, when, how, and where they learn (Anis Chaeruman et al., 2018; Bond et al., 2018; Çakır & Bichelmeyer, 2016). However, students are also required to be able to learn independently, from managing time to determining learning resources (Widiara, 2018). Çakır & Bichelmeyer (Çakır & Bichelmeyer, 2016) stated that it must also be supported by the ease of accessing learning materials rich in information to support learners' independence. Thus, implementing learning requires diverse teaching materials with convenient online and offline access for students (Gusty et al., 2020, p. 48; Widiara, 2018).

However, more diverse teaching materials must be improved in implementing learning activities (Purnama, 2020; Putri Astuti et al., 2018; Safi'i et al., 2021; Triyono, 2021). The problem regarding the teaching materials is relevant to the results of the needs analysis carried out through interviews with several teachers and students at SMKN 1 Turen, SMK Widya Dharma, SMKN 1 Pujon, and SMKN 1 Gedangan that Accurate Online (AOL)-based accounting computer teaching materials are still limited and less varied. The teaching materials used are PowerPoint and manual books. PowerPoint's use in learning needs to be reconsidered in light of the weaknesses of these teaching materials. First, using PowerPoint in learning requires an explanation from the teacher, making the learning activity process still focus on the teacher (Muthoharoh, 2019; Rosyid et al., 2021; Wahyuni & Ananda, 2022). Firstly, teacher-centered learning can reduce students' curiosity about the material and allow them to rely only on information from the teacher (Sibarani et al., 2019). Furthermore, it is challenging to manage the different learning paces of each student using PowerPoint. (Pratiwi, 2022). Additionally, it does not support students' independence in building their knowledge (Amalina & Inayati, 2021; Sibarani et al., 2019). Finally, PowerPoint cannot present actual transaction recordings in accounting computer learning. (A. R. Wulandari & Listiadi, 2018).

The manual book provided by the Accurate Online developer has several weaknesses that need to be considered. First, the manual book containing practical instructions for Accurate Online could be more appealing and can only be accessed online. Furthermore, the content included is different from the curriculum. Therefore, students need to find and sort out the material used in learning. Moreover, the Accurate Online manual book only explains the features available on Accurate Online and only covers the psychomotor domain. The explanation is presented in pictures and brief explanations in written form. In addition, the manual book does not show transaction illustrations and video tutorials; hence, it cannot demonstrate the actual use of Accurate Online. Video tutorials are suitable for accounting computer learning (Giovani et al., 2018) because they can present a particular process precisely and in more detail (A. R. Wulandari & Listiadi, 2018).

In Accurate Online Accounting Computer Learning, teachers provide a few alternative learning resources for students to support the primary learning resources. Meanwhile, students only rely on learning resources from the teacher. Only offering one learning resource tends to limit students' choices by encouraging the assumption

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that the learning resource is crucial and covers all learning content (Chiu, 2021). If the issue of teaching materials is not resolved, it can negatively affect student learning outcomes (Dewi & Lestari, 2020; Yulia et al., 2019). The current instructional resources utilized in the learning process consist of PowerPoint presentations and printed manuals. There are limitations in using PowerPoint for learning that should be emphasized.

Dewi & Lestari (Dewi & Lestari, 2020) define e-modules as structured learning support with material, process, evaluation, and packaged digitally to achieve goals. E-modules are considered feasible in learning activities (Kantun, 2016; Logan et al., 2021; Pramana et al., 2020; Putra & Susilowibowo, 2021; Tania, 2017; Zamhari et al., 2021). E-modules can display information in the form of text and graphics (Komikesari et al., 2020), organize student responses (Laili et al., 2019), and support student learning independence (Mamun et al., 2020). E-modules are also considered more attractive, innovative, and interactive (Prinstin & Handayati, 2018) and facilitate students when studying the teaching materials provided (Laili et al., 2019). The application of e-modules can increase learning motivation (Hamzah & Mentari, 2017; Putri & Purmadi, 2020) and student learning outcomes (Hamzah & Mentari, 2017; Lestari & Parmiti, 2020; D. D. Wulandari et al., 2020).

This research seeks to achieve three objectives: 1) create precise and reliable online e-modules for accounting computer subjects, 2) assess the feasibility of the generated e-modules, and 3) evaluate the usefulness of the developed e-modules. The e-module to be developed in this study specializes in Accurate Online accounting software and is equipped with a video of the steps to use Accurate Online. Tutorials and practice questions are packaged as transaction evidence in trading companies, so students are taught to understand and analyze transaction evidence to be inputted into Accurate Online. Furthermore, the forthcoming e-module can be accessible offline via a computer using an Excel file and online through a link on a smartphone or computer.

METHOD

This study employs a development research design. The research and development procedure was adapted from the ADDIE development model (Dick et al., 2005). The research model is systematically organized to solve the problem of learning resources based on learning needs. This model consists of 5 stages: Analysis, Design, Development, Implementation, and Evaluation. The research and development model was modified according to the researcher's objectives. (1) The analysis stage consists of preliminary studies conducted by needs analysis, learner analysis, and analysis of learning objectives to explore problems in learning. (2) The design stage comprises product design preparation, media selection, material collection, and research instruments. (3) The development stage involves creating and modifying products depending on the outcomes of feasibility validation conducted by media experts, material experts, and a small group of users. (4) In the implementation stage, teaching materials created during learning activities are tested in real-world settings. (5) Evaluation stage: the final stage of assessing the product that has been made. The research stages are shown in Figure 1.

This research and development of teaching material products is carried out using an experimental trial design consisting of two trial stages: product validation test (feasibility trial) and effectiveness test. A pilot study assessed the feasibility and appropriateness of instructional materials for the specific requirements. Simultaneously, the effectiveness test is employed to ascertain the efficacy of utilizing e-modules in learning. An experimental study design, namely the Non-Equivalent

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Control Group Design model, was used to conduct the test on the field trial group. This study employed two distinct groups: the experimental and control groups. The experimental group refers to a specific group of individuals who receive treatment by distributing e-modules. A control group is a group that is not distributed e-modules but is given printed teaching materials containing a summary of Accurate Online material. Table 1 is the design of the experimental research conducted.

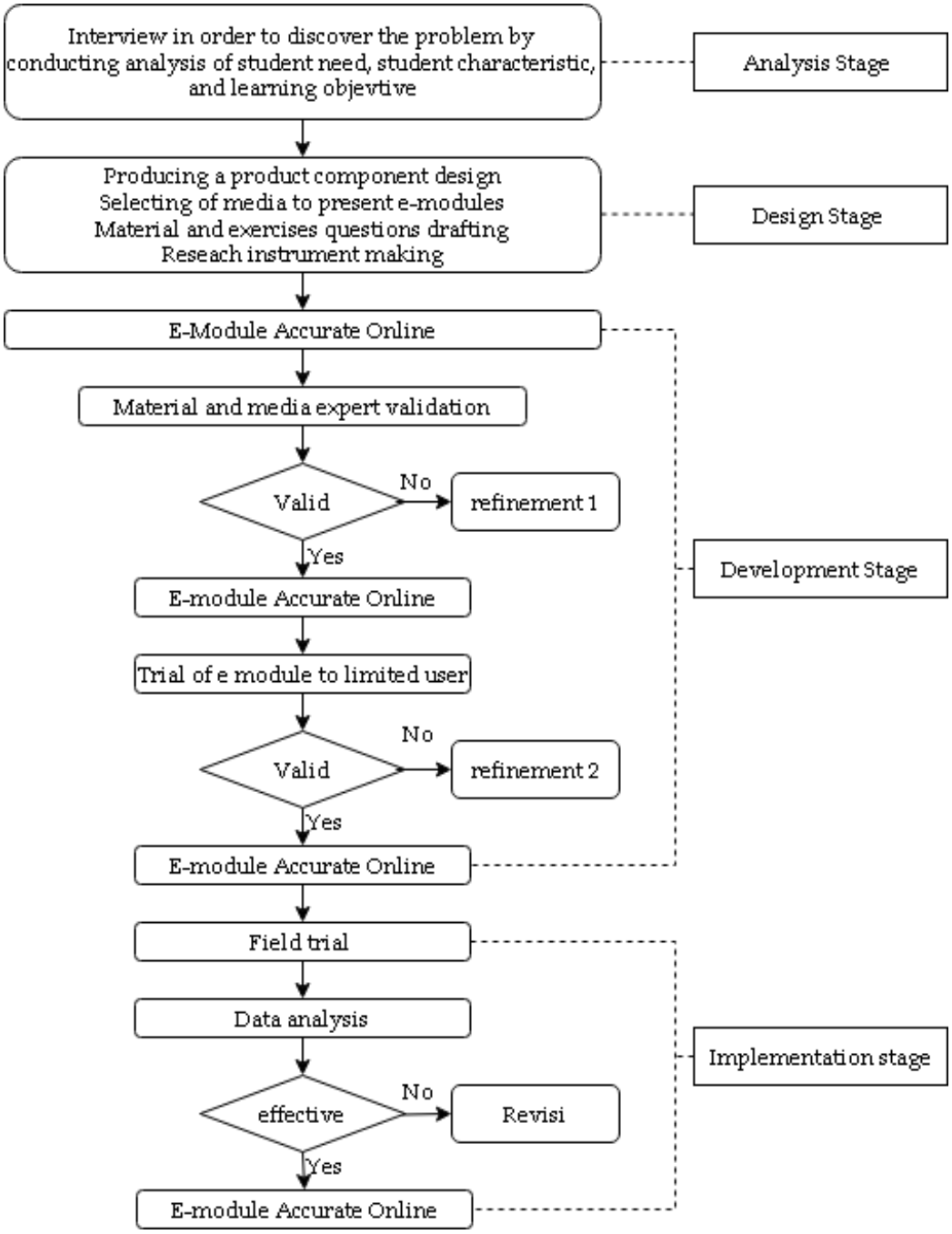

Figure 1. Stages of Product Development

Table 1. Experimental Research Design

O_1	X	O_2
O_3		O_4

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Description:
O_1 = pretest in the experimental class
O_2 = Post-test in the experimental class
X = Treatment in the form of giving e-modules
O_3 = Pretest in the control class
O_4 = Post-test in the control class

SMKN 1 Turen, SMK Widya Dharma, SMKN 1 Pujon, and SMKN 1 Gedangan have been selected to perform needs analysis, student characteristics analysis, and curriculum analysis to gather information about the issues related to Accurate Online teaching materials. Meanwhile, the material validity test, limited user trial, and field trial were conducted at SMKN 1 Turen. The research subjects consisted of several teachers teaching accounting computer subjects and several students at SMKN 1 Turen, SMK Widya Dharma, SMKN 1 Pujon, and SMKN 1 Gedangan. The validity test subjects were two material experts (1 accounting lecturer and one accounting computer subject teacher), a media expert (Educational Technology lecturer), and eight class XII AKL 3 students at SMKN 1 Turen as a limited user trial. At the same time, the field trial subjects consisted of students of class XII AKL 1 and XII AKL 2 at SMKN 1 Turen, who were taking accounting computer subjects with a total of 35 and 33 students, respectively.

The instruments used in this research are interviews, questionnaires, and tests. Interview guidelines were used at the analysis stage for teachers and students to explore information on problems in learning computer accounting. The following guide modified the interview guidelines from Wati et al. (2020) and Yulianingsih et al. (2023).

Table 2. Interview Guidelines

	Indicator	Questionnaire
1.	Need Analysis	1.1. Learning sources used
		1.2. Intensity to use learning material or resource
		1.3. Obstacle in using the learning material
		1.4. Expectations in the development of teaching materials
2.	Curriculum Analysis	2.1. Curriculum that is being applied
		2.2. Learning method used
		2.3. Learning topics or chapters that need to be developed more
3.	Student Characteristic Analysis	3.1. Student learning interest
		3.2. Student learning outcome
		3.3. Learning problem
		3.4. Expectations for problem-solving

Source: modified from Wati et al. (2020) and Yulianingsih et al. (2023)

The questionnaire tool validated materials experts, media experts, and limited users. Questionnaire research tools are used to obtain data on product feasibility as material for improving the products being developed. The data obtained from the questionnaire are materials expert evaluation, media expert evaluation, and limited user evaluation. To get this data, a questionnaire instrument was utilized, which was obtained and adapted from Yana et al. (2019), Rohman & Lusiyana (2017), Yulianto (2022), Kosasih (2022), and Winarno et al. (2009) as can be seen in Table 3.

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Table 3. Material Expert Assessment Indicator

Assessment Aspect	Indicator	Item Questionaire
1. Content Feasibility	1.1. Compliance with essential competencies and indicators.	1
	1.2. Compliance with student needs.	2
	1.3. Compliance with the need for teaching materials.	3
	1.4. The correctness of the material substances.	4, 5,6
	1.5. Benefit to add insight into knowledge.	7,8
2. Linguist	2.1. Readability	9
	2.2. Information clarity	10
	2.3. Compliance with Indonesian language rules	11
	2.4. Effective use of language	12,13
3. Presentation	3.1. Purpose clarity	14
	3.2. Presentation order	15, 16
	3.3. Information completeness	17, 18
4. Graphic	4.1. Use of font (type and size)	19, 20, 21
	4.2. Layout and display	22, 23, 27
	4.3. Illustration and pictures	24, 25, 26,

Source: Modified from Rohman & Lusiyana (Rohman & Lusiyana, 2017), Yana et al (Yana et al., 2019)

Table 4. Media Expert Assessment Indicator

Assessment Aspect	Indicator	Item Questionaire
1. Subject matter	1.1. Completeness of e-module elements.	1
	1.2. Material order.	2
	1.3. Clarity of language used.	3
	1.4. Compliance of material with the learning objective.	4
	1.5. Availability of information or explanation of certain term.	5
2. Auxiliary information	2.1. Availability of information in the form of usage instruction.	6
	2.2. Clarity of usage instruction.	7
3. Affective considerations	3.1. Attractiveness.	8, 9, 10
	3.2. Ability to guide students in learning activities.	11, 12
4. Interface	4.1. Text readability.	13
	4.2. Font type, size, and color selection.	14, 15
	4.3. Color combination in e-module.	16, 17
	4.4. Images, animations, and videos are presented in accordance with material.	18, 20
	4.5. Combination of images, animations, and text presented harmonious.	19
5. Navigation	Ease of users to be able to move around the page according to their wishes	21
6. Robustness	6.1. Ease of use	22, 23
	6.2. Durability of the program	

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Source: Modified form Yulianto (Yulianto, 2022), Winarno et al (2009) and Kosasih (Kosasih, 2022)

Table 5. Limited User Assessment Indicator

Assessment Aspect	Indicator	Item Questionaire
1. Material Presentation Aspect	1.1. Material order.	2
	1.2. Easy to understand the material.	1,3
	1.3. Presentation of learning activities to make it easier to learn in stages.	4
	1.4. Use of sentences and terms that are easy to understand.	5,6
	1.5. Compliance with question exercises and evaluation of the material.	7
2. Presentation Aspect	2.1. The presentation of the cover is clear and describes the contents of the module	8, 9
	2.2. Appropriateness of font usage (type and size)	10, 11, 12
	2.3. Appropriateness of pictures and illustrations	12, 13
	2.4. Clarity of the introduction	14
	2.5. Clarity of learning activities	15, 16
	2.6. Clarity of summary	17
	2.7. Clarity of evaluation, glossary, and bibliography	18, 19, 20
3. Learning Aspect	3.1. Attract students to use it as a learning resource.	21
	3.2. Ease of understanding the material.	22,23,24
4. Benefit Aspect	Usefulness in learning computer accounting	25,26, 27, 28

Source: Modified from Rohman & Lusiyana (Rohman & Lusiyana, 2017), Kosasih (Kosasih, 2022)

The test instrument was utilized to gather data regarding disparities in learning results between the control and experimental classes. The tests used consisted of pretests and post-tests in the form of skill questions containing case studies of computerized accounting of trading companies. The test instrument was taken and modified from Suyono (2013). The test was prepared by considering the competencies that students must achieve and reviewed by two material experts before being tested on students.

This research utilizes two different types of data: qualitative and quantitative. Qualitative data was collected through interviews, comments, and suggestions on expert validation sheets and from a select group of users. Quantitative data was obtained from specialist validation sheets, limited user questionnaires, and pretest and post-test learning outcomes. Qualitative data analysis techniques use inference techniques. Meanwhile, quantitative data obtained from expert questionnaires and limited users were analyzed using the validity calculation formula for each validator, adapted from Akbar (2016) (Equation 1).

$$\text{Validity} = \frac{\text{TSe}}{\text{TSh}} \times 100\% \quad \text{.....(Equation 1)}$$

(Source: Akbar, 2016)

Description:

TSe = Total score of respondent's answer

TSh = Total maximum score in 1 item

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100% = Constant

The calculation of combined validity is done using Equation 2. The validity calculation results will be used to determine the feasibility of the media developed, using the meaning according to Table 6.

$$V = \frac{\text{V-ah1} + \text{V-ah2} + \text{V-pg}}{3} = \ldots\% \qquad \text{(Equation 2)}$$

(Source: Akbar, 2016)
Description:
V = Validation (combined)
V-ah1 = Expert validation 1 (media expert)
V-ah2 = Expert validation 2 (material expert)
V-pg = User validation (student)

Table 6. Assessment Result Interpretation

Percentage	Description
81-100%	Highly valid, can be used without correction
61- 80%	Moderately valid and usable but needs minor improvements
41- 60%	Less valid, needs significant improvement, and recommended not to be used
21- 40%	Invalid, cannot be used
0-20%	Highly invalid, should not be used

(Source: Akbar, 2016)

Quantitative data collected from the pretest and post-test will be analyzed using the N-gain score test to assess the disparity in student learning outcomes improvement between the control class and the experimental class. Using the formula and criteria provided (Equation 3 and Table 7), the test evaluates the actual gain score against the maximum gain score.

$$\langle g \rangle = \frac{\text{post test score} - \text{pretest score}}{\text{ideal score} - \text{pretest score}} \qquad \text{(Equation 3)}$$

(Source: Hake, 1999)
Description:
$< g >$ = Normalized gain

Table 7. Normalized Gain Score Interpretation

Value < g >	Description
$-1,00 \leq g < 0,00$	There is a decrease
$g = 0,00$	No improvement
$0,00 < g < 0,03$	Low
$0,03 \leq g < 0,07$	Moderate
$0,07 \leq g < 1,00$	High

(Source: Hake, 1999)

A T-test must be conducted to determine whether the difference in learning outcomes between the two classes is significant. However, before conducting the T-test, performing a normal test is essential. The selected statistical test is the independent sample t-test. The implications of performing a T-test using SPSS are as follows: if the significance value (2-tailed) is less than 0.05, it indicates no significant

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disparity in the mean student learning outcomes between the experimental and control groups. Conversely, if the significance value (2-tailed) is more than 0.05, it indicates a substantial disparity in the average student learning results between the experimental and control classes.

RESULT AND DISCUSSION

Analysis Stage

The interviews gathered valuable information regarding the curriculum for Accurate Online Accounting Computers, which is KD 3.11-3.19 and 4.11-4.19. In addition, computer-based accounting courses based on Accurate Online software are still new, so the learning materials need to be expanded and more diverse. The modern instructional resources utilized in education comprise PowerPoint presentations and printed manuals. Some restrictions need to be emphasized regarding the use of PowerPoint in learning. PowerPoint is considered monotonous, less attractive, cannot adjust the different study agility of each student, requires an explanation from the teacher, causing lessons to only focus on the teacher, and needs to be more robust to support students' self-learning.

The manual book is impractical, does not correlate with the essential competencies of computer accounting, does not have a real transaction example, and only focuses on the psychomotor aspects. On the other hand, students do not have other learning materials and only rely on learning materials provided by the teacher. Students also need help following the teacher's instructions, so many have yet to reach the minimum competency criteria. These learning problems require the right solution. This is because limited learning materials can interfere with student understanding and lead to boredom in learning (Saidah & Nugroho, 2015). Upon reviewing the results of the analysis, the researcher aims to create practical e-modules for teaching purposes. These modules will focus on the specific competencies that students are expected to acquire, including real-life transaction examples, and effectively demonstrate the natural utilization of Accurate Online.

Design Stage

Researchers compile e-modules by determining the essential competencies and learning objectives related to the Accurate Online e-module. Next, gather the necessary materials, such as reference materials and practice questions, to be incorporated into the e-module. The e-module focuses on computerized accounting in trade enterprises, covering the necessary skills and knowledge with essential competencies 3.11-3.19 and 4.11-4.19. The e-module has nine contents: 1) preparing the company's business data; 2) Compile a list of accounts; 3) Creating a trading company auxiliary card; 4) Purchase transactions; 5) Sales transactions of trade goods; 6) Transactions of cash disbursements and receipts outside the business; 7) Adjustment transaction entry; 8) Presenting financial statements; 9) and Backup of business data. Content is collected from various sources, while practice questions are prepared by adjusting the essential competencies and examples from around the students.

At this step, the researcher also engaged in the task of identifying the content or components within the e-module. The e-module will be available in the introductory section, primary material, and concluding paragraph. The introduction has a cover, table of contents, preface, list of photographs, general description, glossary, instructions for utilizing the module, prerequisites, ultimate objectives, and pre-assessment. The content section includes nine learning activities, each containing essential competencies, learning objectives, learning videos, learning materials,

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learning activities summary, group assignments, and formative tests. Then, the closing section includes an evaluation, answer key, and bibliography. At the same stage, media selection was also performed to present all e-module components, prepare research instruments, and make storyboards to facilitate researchers in developing Accurate Online e-modules. The following storyboard was prepared at the design stage.

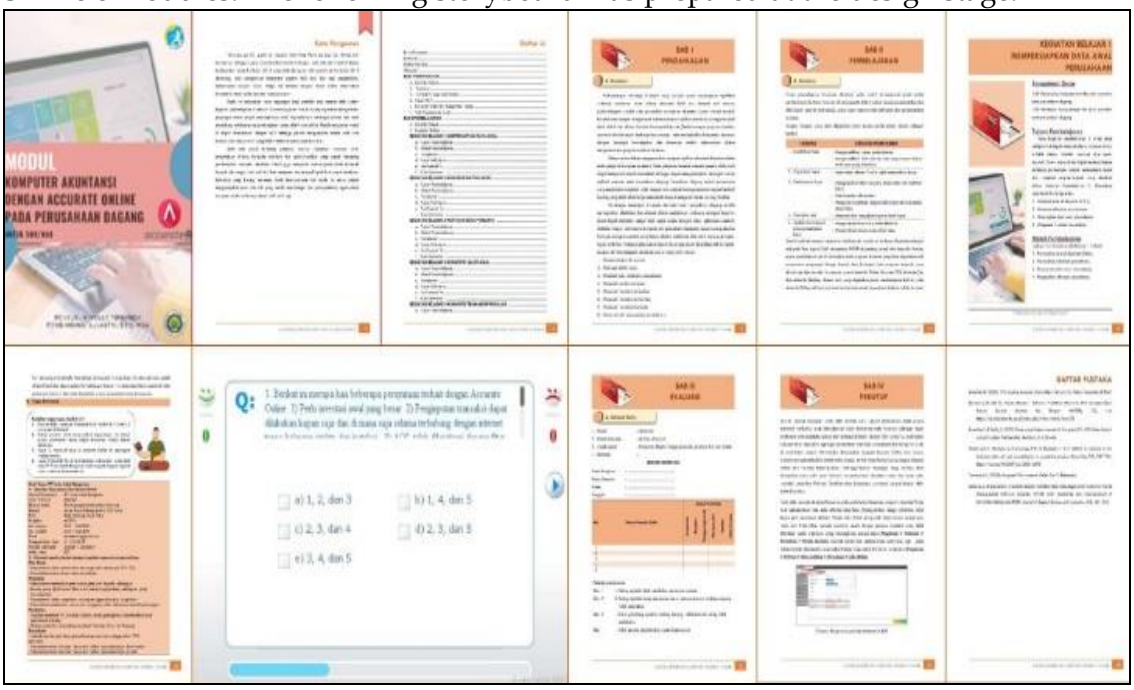

Figure 2. E-module Accurate Online Storyboard

Development Stage

The development stage is implemented by producing a product in the e-module form and testing the module's feasibility and revision by experts and limited users. Accurate Online e-modules are created by combining all product components at the design stage through the Flipbook maker software. The Accurate Online e-module is produced with exe storage format and links that can be accessed offline through computers and online through cellphones and computers.

After the Accurate Online e-module was developed, validity testing and limited user trials were performed to test its feasibility—the e-module validation involved one media expert and two experts. Educational technology lecturers performed the media validation process with qualifications relevant to the product developed. Validation was performed using a questionnaire that reviewed aspects of navigation, subject matter, affective considerations, auxiliary information, interface, and robustness. The expert validation yielded a 98% success rate, indicating valid criteria. Table 8 is the specifics of these results.

Table 8. Validity Results by Media Experts

Assessment Aspects	TSe	TSh	%	Feasibility Criteria
Subject matter aspect	20	20	100%	Highly valid
Auxiliary information aspect	8	8	100%	Highly valid
Affective considerations aspect	16	16	100%	Highly valid
Interface aspect	30	32	94%	Highly valid
Navigations aspect	4	4	100%	Highly valid
Robustness aspect	8	8	100%	Highly valid
Overall aspect validity	86	88	98%	Highly valid

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Subsequently, the content underwent validation by two specialists who assessed its appropriateness, language, presentation, and graphics. Expert 1 is a lecturer specializing in accounting, whereas Expert 2 is a computer teacher specializing in accounting. The expert validation process had a 95% success rate, indicating highly valid eligibility requirements. However, there are some constructive suggestions from the experts for improving the e-module. The revisions include adding information about the target users of the e-module on the cover page, explanations related to the estimated account selected in the salary and electricity payment transactions, and practice questions. Consequently, the Accurate Online e-module is appropriate for learning, with specific information provided in Table 9 as outlined below.

Table 9. Expert Validity Result

Experts	Assessment Aspect	TSe	Tsh	%	Feasibility Criteria
Expert 1	Presentation aspect	19	20	95%	Highly valid
	Graphics aspect	32	36	88%	Highly valid
	Language aspect	19	20	95%	Highly valid
	Content feasibility aspect	30	32	93%	Highly valid
	Validity of all aspects	100	108	93%	Highly valid
Expert 2	Presentation aspect	20	20	100%	Highly valid
	Graphics aspect	34	36	94%	Highly valid
	Language aspect	20	20	100%	Highly valid
	Content feasibility aspect	31	32	97%	Highly valid
	Validity of all aspects	105	108	97%	Highly valid
	Material validity results	205	216	95%	Highly valid

The next feasibility test was performed on limited users, as many as eight students who took the AOL accounting computer course. The aspects reviewed are content delivery, presentation, learning, and benefits. The limited user test obtained a score of 95%, which means that the Accurate Online e-module product is very valid in that it is very feasible to use, engaging, interactive, and facilitates students to understand learning objects. The improvements based on the user trial were to increase the font size in the e-module. Table 10 is the details of the limited user trial results. The validation results from each validator are described in Table 11 below.

Table 10. Limited User Validity Results

No	Students Name	TSe	TSh	%	Feasibility Criteria
1	Annisa Jurrofiah	104	112	93%	Highly valid
2	Rania Alifiyah E	101	112	90%	Highly valid
3	Veti Nur Aisyah	109	112	97%	Highly valid
4	Dea Vasya N	111	112	99%	Highly valid
5	Nadia Nafisa	107	112	96%	Highly valid
6	Enggar Okta R	107	112	96%	Highly valid
7	Faradila Rahma	107	112	96%	Highly valid
8	Ahmad Farikhin	103	112	92%	Highly valid
	Limited User Validity Results	849	896	95%	Highly valid

Table 11. Validity and Feasibility Test Result

Validator	TSe	TSh	Percentage	Criteria
Media Expert	86	88	98%	Highly valid
Content Expert	205	216	95%	Highly valid
Limited Users	849	896	95%	Highly valid
Aggregate Validity			96%	Highly valid

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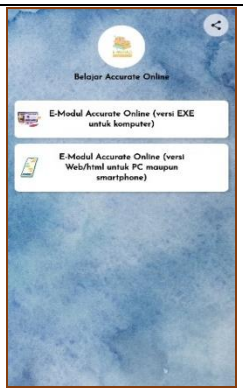
Table 12. E-Module Accurate Online Display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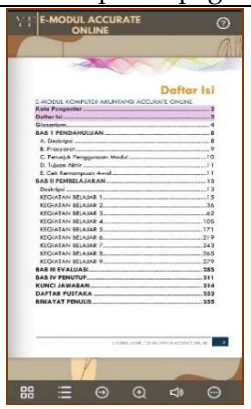
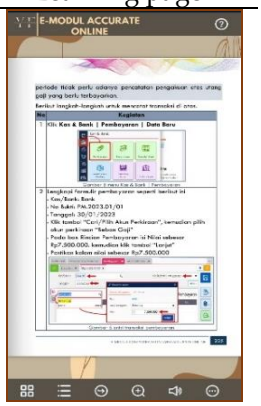
			
List of contents	Glossary	Introduction	Learning page
			
Learning activities page	Learning videos	Topics with transaction examples	Topic discussion
			
View chapter III evaluation	Key Answer	Bibliography	Author profile

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Based on Table 11, the assessment results performed by experts and limited users reached an average of 96%. Therefore, based on Table 6, the assessment criteria shown in the validation and feasibility test results table indicate that the Accurate Online e-module is in the first level with a very strong validity predicate and can be used in the effectiveness test without revision. This e-module teaching material was created in response to the demand for educational tools and materials for students. Accurate Online e-modules were developed by considering the criteria for suitable digital teaching materials according to Winarno et al. (2009), namely (1) subject Matters, the accuracy of the content structure and content; (2) auxiliary information, other information that is not correlated with the material such as user guides, (3) affective considerations, e-modules are interesting so students can afford to learn more, (4) interface, the e-module display is proper with text, animation, audio, and video, (5) navigation, e-modules are developed with the easy and straightforward operation, and (6) robustness, the endurance of the program is good from an error when used.

The final result of this development stage is the Accurate Online e-module with computerized accounting material in trading companies, which has been tested for feasibility and improvements based on expert validation and users. The findings of this study align with prior research, which affirms that the creation of e-modules is both achievable and reliable in facilitating accounting education (Denisa & Hakim, 2021; Gunawan, 2020; Tania, 2017). The e-module as a product of this research can be accessed via bit.ly/m/Belajar-Accurate-Online as follows (Table 12).

Implementation Stage

The implementation stage was performed after the product was categorized as feasible and valid. The effectiveness test is conducted at this step to assess the disparity in learning results between the control and experimental groups before and after implementing the learning process. The efficacy assessment was conducted on students from class XII AKL 1 SMKN 1 Turen as the experimental group and XII AKL 2 SMKN 1 Turen as the control group. The test was performed for 18 lesson hours or three meetings in each group. Experiment class learning was performed using e-modules, while control class learning was equipped with printed teaching materials containing a summary of Accurate Online material. During the efficacy test, every class underwent two rounds of testing: one before the pretest and another after the post-test after the learning activities. The test was a skills evaluation that included a case study on accounting computerization for trading organizations, explicitly covering the topics from KD 4.11-4.19. Subsequently, the N-Gain score was computed using the test outcomes, which were then presented.

Table 13. Student Performance

No	Group	Average		N-Gain	Category
		Pretest	Post-test		
1.	Experimental Group	65,11	93,75	0,82	High
2.	Control Group	60,08	85,45	0,64	Moderate

According to Table 13, the average learning outcomes of the experimental class surpass those of the control class, suggesting that students who utilize e-modules have a higher level of comprehension than those who do not. This may be seen by comparing the N-Gain scores of the experimental class with the control class. The experimental class scored 0.82, which falls into the high category, while the control class achieved a score of 0.64, which falls into the medium category. Hence, the e-module proves to be efficacious in enhancing student learning results. The subsequent

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analysis is a normality test conducted on data with a distribution that is expected to be average. The results of this test indicate a significance level of greater than 0.05, as presented in Table 14.

Table 14.Normality Test

Group		Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
N_Gain_Score	Experimental Group	0.133	35	0.120
	Control Group	0.113	33	.200*

The data follow a normal distribution, according to Table 14. Therefore, an independent sample t-test was used to assess the efficacy of e-modules in learning. The findings are presented in Table 15.

Table 15. Independent Sample T-Test Results

Group	N	Sig. (2-tailed)	Mean	Std. Deviation	Std. Error Mean
Experiment Group	35	0,000	0,8199	0.1452	0.02455
Control Group	33		0,6401	0.1755	0.03057

Based on Table 15, the results of the independent sample t-test show a significant value (Sig. (2-tailed) of 0.00 <0.05), indicating a significant difference in the average student learning outcomes between the experimental class and the control class. The Accurate Online e-module affects student learning outcomes and effectively improves accounting computer learning outcomes in trading companies. The Accurate Online e-module was created in response to the specific requirements of the pupils. The material provided is presented in simple language yet supported by illustrations and cases that are related to the general situation, thus helping students to understand it more easily (Jayasinghe, 2021; Kosasih, 2022; Luhsasi & Sadjiarto, 2017; Prabowo et al., 2016).

The Accurate Online e-module contains tutorials and case studies based on transaction evidence. The material and exercise questions are derived from transaction evidence, ensuring that students may quickly grasp the subject matter since the examples offered closely resemble real-world accounting procedures (Ambarwati & Rochmawati, 2020; Fauzi, 2016; Saruati & Susilowibowo, 2020; Stütz et al., 2022). In addition, students can learn to understand and analyze transaction evidence before recording it into Accurate Online (Fauzi, 2016). Meanwhile, the material is presented with tutorials that will encourage students to understand step by step the Accurate Online program (Putra & Susilowibowo, 2021), and students can learn while practicing directly (Rafianti et al., 2018).

E-modules include both theoretical and practical exercises to engage students in active learning. This includes tasks such as problem analysis, trial designs, and presentations. (Luhsasi & Sadjiarto, 2017). Singh et al. (2014) stated that practice questions would provide a better understanding of the material. Exercise will be a challenge that requires students to think and apply the concepts learned independently (Singh et al., 2014). The Accurate Online e-module also has a learning video connected to YouTube. Video presentation facilitates students' understanding of material concepts (D'Aquila et al., 2019; Gijsen et al., 2024; Pollock et al., 2023). It is because videos can demonstrate the operation of Accurate Online in detail and precisely (D'Aquila et al., 2019; Giovani et al., 2018; Rubiyati et al., 2022; A. R. Wulandari & Listiadi, 2018).

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Accurate Online e-modules are presented systematically with a focus on e-module implementation so that students can master competencies in a specific time depending on their conditions and potential (Kosasih, 2022). The structure of e-module components that are systematic and focus on individualized learning can enable learners to master one learning activity first before moving on to the next learning activity (Hamzah & Mentari, 2017; Putra & Susilowibowo, 2021) so that learners are free to set their learning pace (Sasmita & Fajriyah, 2018). A complete description of the material and elements, easy-to-understand learning stages, an attractive display, and presenting various images, audio, video, and text will encourage independent learning in students, thus having a positive impact on student learning outcomes (Hastiningrum & Haryanto, 2020; Hendri, 2018).

Based on the effectiveness test shows that learning outcomes in experimental classes that implement e-modules are better than classes that still implement print-based teaching resources. In the experimental class, the Accurate Online e-module was a tool provided by the teacher so that students could build their knowledge independently. Through the AOL e-module, the teacher only roles as a facilitator who provides facilities in The Accurate Online e-module teaching materials with materials and all content presented in it (Susanto, 2021), while students are more actively involved in building their knowledge (Luhsasi & Sadjiarto, 2017). So that students' learning experience is obtained through something other than the teacher. Instead, the teacher only plays a role in providing direction, guiding, and assisting students so that it can lead to achieving learning goals (Bada & Olusegun, 2015; Ee et al., 2023).

In the control class, students tend to be inactive (Premana et al., 2021; Yuanta, 2020). Teachers possess a greater degree of dominance in explaining than others because pupils encounter difficulties in comprehending the information independently (Sari et al., 2019; Hutagalung et al., 2019). The reason for this is that educational materials sometimes lack practicality, become boring, and fail to captivate the audience (Hastiningrum & Haryanto, 2020; Puspitasari, 2019; Yuanta, 2020), which leads to boredom and a lack of enthusiasm for learning (Delpech, 2010). The Accurate Online e-module is attractive, interactive, practical, and easily accessed (Prasetyo, 2020). Learning both in and outside school can offer pupils numerous advantages (Kurniati et al., 2018; Prasetyo, 2020). Therefore, creating precise online e-modules can enhance student engagement in constructing their knowledge and increasing academic achievements. Thus, this finding aligns with the findings of Gunawan (2020), Hamzah & Mentari (2017), Hendri (2018), Susanti & Sholihah (2021), Darpiyah & Sulastri (2023), indicating that e-modules have a positive impact on enhancing student learning outcomes.

Evaluation Stage

At the evaluation stage, researchers assessed each stage of development to identify the suitability of the product development performed with the expected product. Evaluation is performed at the previous four stages of development. The results are based on expectations at the analysis stage, such as problem studies, learner characteristics, and learning objectives. At the design stage, results were obtained based on the required specifications, such as product design, material details, exercise questions, expert validation sheets, and limited users. At the development stage, learning products have been developed using Accurate Online e-modules based on the design stage.

Furthermore, the e-module has undergone scrutiny by material specialists and media experts, who have confirmed its validity. The outcomes of limited user testing

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indicate that it is convenient for use in the learning process. At this juncture, enhancements have additionally been implemented based on recommendations provided by specialists. An evaluation was conducted during the implementation phase. E-modules assessed as feasible and valid are tested directly in learning activities with effective results to improve students' accounting computer learning outcomes.

Accurate Online e-module teaching materials with accounting computerization material in trading companies are obtained based on the five stages of developing teaching materials. These are feasible for learning and effective for improving accounting computer learning outcomes. The advantages of this learning media are: (1) Accurate Online e-module is easy to operate and understand; (2) Presents material that is relevant to the competencies that students must achieve; (3) Trading companies offer a series of nine accounting computerization sessions, allowing students to study logically and progressively based on their talents. (4) The material is delivered through tutorials and transaction evidence, aiming to build an engaging e-module that encourages students to comprehend the material through hands-on practice. (5) Accurate Online e-module can precisely and accurately illustrate the operation of AOL accounting computers through the presentation of transaction evidence, videos, and tutorials; (6) It has complete components and diverse practice questions. The weaknesses of this e-module are that it cannot be accessed offline using a smartphone, it only presents computerized accounting material for trading companies, and it needs to present Accurate Online material for advanced levels.

CONCLUSION

This research resulted in teaching material as an e-module of accounting computers based on Accurate Online software. Based on the results of expert validation, Accurate Online e-modules were successfully developed and are very feasible to apply in learning computer accounting. Experts assessed the feasibility of e-modules by 95%. Media experts assessed the e-module with 98% feasibility. Further, in the trial process, the e-module was rated 95% in the limited user test. The efficacy assessment demonstrates that the Accurate Online e-module has a substantial impact on enhancing student learning results. It is shown by using statistical tests such as the t-test and N-Gain, as well as the observation of an improved average learning outcome value following the implementation of the e-module. Precise online e-modules possess an aesthetically pleasing layout. They are accompanied by instructional videos, supplementary materials, and interactive exercises, all serving as compelling evidence to engage students in the subject matter.

Developing accurate e-modules online provides an alternative method for addressing issues with instructional materials. The e-module is a viable instructional resource for teachers and students studying computerized accounting for trading companies. A constraint of this research is that the e-module must still include lessons at an advanced level. Furthermore, this study solely examined the efficacy of learning outcomes, thus necessitating further investigation to assess the usefulness of other facets. By utilizing Accurate Online, this research could enhance the quality of accounting computer learning at the Vocational High School level.

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