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Contextual Teaching and Learning (CTL) Module to Improve Conceptual Understanding and Practical Skills in Vocational Accounting

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ABSTRACT

Accounting learning in vocational high schools requires innovative strategies that enable students to master both conceptual understanding and practical skills. The use of a structured and systematic teaching module offers an effective alternative to achieve this goal, especially when designed to support self-directed learning. This study aims to develop a Contextual Teaching and Learning (CTL)-based teaching module through the Research and Development (R&D) approach using the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The research involved eleventh-grade students of SMK Negeri 2 Trenggalek as participants. The results of this study indicate that in terms of learning media, the module obtained an average score of 4.54; the material aspect 4.56; and the benefits aspect 4.38. All three are in the "very appropriate" category, with an overall average of 4.53. The findings of this study demonstrate the consistency of the module's quality, as indicated by all aspects obtaining the "very appropriate" category. This confirms that the CTL-based teaching module for the Productive Accounting subject has met high standards of appropriateness from the students' perspective.

A. INTRODUCTION

Contextual Teaching and Learning (CTL) encourages students to be active and helps connect academic lessons to their lives (Taufik, 2019). Challenges faced in the Contextual Teaching and Learning (CTL) method include limited resources, particularly in terms of teacher mastery of technology. Possible solutions include increasing teacher training and professional development in the use of technological media and the application of the CTL method. Teachers need to be trained on how to operate and integrate learning media with a context-based approach into the curriculum (Suryadi, 2024).

According to Maya (2025), it was reported that less than 50 students had difficulty understanding theory and application, which ultimately affected the limitations of curriculum evaluation, so this was very important and required attention in order to improve students' skills and competencies in facing the world of work. Limited contextual and digital-based resources hinder students' ability to apply accounting principles in tasks such as preparing financial statements or analyzing company performance. Consequently, their conceptual and practical skills remain weak (Ginting et al., 2025). The Contextual Teaching and Learning (CTL) approach offers a promising solution to bridge this gap between theory and practice (Ayuningtias & Widiyohening, 2025). Hasibuan (2014) CTL is a holistic learning approach that encourages students to connect theoretical knowledge with real-life contexts personal, social, and cultural. It transforms learning into a meaningful process where knowledge becomes part of students' real experiences. By relating academic concepts to authentic problems, CTL helps

students understand what they learn, why it matters, and how to apply it in real-life situations (Nababan & Sipayung, 2023).

Similarly, Setiawan (2020) CTL positions academic content within real-life contexts, bridging the gap between classroom learning and reality. Through contextual activities like projects, simulations, and case studies, students actively engage, process information, and apply their knowledge to authentic situations. This approach aligns with vocational education goals, emphasizing practical performance over rote memorization. Furthermore, Amalia and Rasiman (2019) CTL enables students to generate ideas, express creativity, and engage in reflective learning that fosters autonomy, imagination, and critical thinking.

Putra and Rochmawati (2020) found that CTL-based learning materials enhance students' comprehension in banking and microfinance accounting, while Pratiwi and Listiadi (2021) Contextual e-learning modules have been shown to enhance students' understanding of governmental accounting. These findings indicate that contextualized materials significantly boost students' engagement, analytical reasoning, and confidence in problem-solving.

Based on preliminary observations at SMK Negeri 2 Trenggalek, it was found that CTL-integrated teaching modules remain scarce despite the growing awareness of their pedagogical value. A module, as defined by Magdalena et al. (2020), is learning module is a structured resource that provides guided and comprehensive learning experiences through explanations, examples, exercises, and reflection. Ideally,

Based on research from Yoseptry et al. (2022), in the case study of Entrepreneurial Vocational School and PGRI 3 Vocational School in Cimahi City, it was stated that students were unprepared to enter IDUKA, lack of student competency in productive expertise, IDUKA's lack of seriousness in accommodating vocational school students and lack of funds to support the program to improve the quality of learning. Another problem is the lack of teacher competency, vocational school teachers are required to have the ability to produce graduates who are ready to use, but most vocational school teachers are not people who have vocational skills but more normative skills, there is still a great lack of teachers because teachers do not come from IDUKA.

The limited integration of modules with the Contextual Teaching and Learning (CTL) approach makes it difficult for students to perform practical tasks such as preparing financial reports or analyzing company performance. This research gap is evident in the scarcity of modules that facilitate digital self-directed learning while linking the material to real-world business cases within the student's environment.

The urgency of this research is driven by low student engagement and weak conceptual understanding due to the teacher-centered (conventional) learning process. Without innovative, contextual teaching materials, students' practical skills will remain low and out of step with the demands of a dynamic workplace. The novelty of this research lies in the development of a CTL-based productive accounting module systematically designed using the ADDIE model and packaged in an interactive digital format.

The uniqueness of this research lies in the development of a Contextual Learning (CTL) module through the systematic application of the ADDIE model, which is designed to improve learning outcomes by bridging the gap between theoretical material and real-life contexts. This approach transforms the learning process into a more meaningful and applicable experience for students.

This module offers updated, contextual materials that encourage active participation, critical thinking, and real-world application. Furthermore, the study seeks to examine the effectiveness of the CTL (Critical Thinking and Learning)-based teaching module in enhancing the conceptual understanding and practical accounting skills of eleventh-grade vocational students.

B. METHODS

1. Research Subjects

This study involved Phase F (Grade XI) students of the accounting subject at SMK Negeri 2 Trenggalek. The site was selected based on preliminary observations showing limited availability of CTL-based teaching modules for productive accounting. Existing materials remain conventional and less relevant to real-life contexts, reducing learning effectiveness. The research was conducted in the first semester of the 2024/2025 academic year, following the school's academic calendar.

2. Research and Development Procedures

This study used a Research and Development (R&D) approach with the ADDIE model, consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation (Saputro, 2017).

Figure 1. Stages of the analysis procedure

Figure 1 shows that this study used the ADDIE model, which began with an analysis phase, namely observation at SMK Negeri 2 Trenggalek and analysis of the Accounting Phase F curriculum to determine learning outcomes. In the design phase, the researcher developed a Learning Objective Flow (ATP) based on a contextual approach and designed the module structure and evaluation instruments. Entering the development phase, the module draft was prepared and validated by language, material, and media experts, then revised based on expert input before being trialed on a limited basis with 10 students. In the implementation phase, the module was trialed on a large scale with 36 grade XI students using pre-test and post-test methods to measure its effectiveness. Finally, the evaluation phase was carried out by analyzing questionnaire response data and test results to determine the final feasibility of the module and provide recommendations for future improvements.

Table 1. Syntax CTL

No	Phase	Activities
1	Implementation of the Learning Process	• The teacher poses questions that lead to problem identification. • The teacher delivers theoretical instruction using the developed module. • Students engage in group discussions based on the assigned tasks. • The teacher monitors and facilitates the learning process, providing support when difficulties arise.
2	Students' Responses to the Learning Media	• Students conduct learning activities using the module. • Students carry out practical exercises related to the learning material. • The teacher instructs students to record and reflect on all ideas gained from the module.
3	Students' Learning Outcomes	• The teacher administers a pre-test to assess initial understanding. • The teacher administers a post-test to evaluate students' learning improvement after using the module.

In the development phase, the teaching module was created based on the design framework and validated by subject matter, media, and language experts through questionnaires, followed by revisions based on feedback. The implementation phase involved testing the module with 36 Grade XI students at SMK Negeri 2 Trenggalek, using pre- and post-tests to measure learning improvement. The evaluation phase analyzed questionnaire and test data to assess the module's feasibility and effectiveness in enhancing students' conceptual understanding and practical accounting skills.

3. Data Analysis

Descriptive analysis was used to examine data from the module development, consisting of feasibility and effectiveness analyses. Feasibility was assessed through expert validation by material, media, and language experts using a five-point Likert scale (1–5). The results were evaluated by calculating the average score for each aspect, with scoring criteria presented in Table 2.

The criteria for material experts were teachers or lecturers in accounting and had a minimum of 15 years of work experience. The criteria for media experts were teachers or lecturers in Informatics/Computer Engineering and had a minimum of 15 years of work experience in their field. The criteria for language experts were Indonesian language teachers with a minimum of 20 years of work experience. The validation questionnaire was created using a Likert scale (1-5).

Table 2. Likert Scale Categories

Score	Criteria
5	Higlhy Feasible
4	Feasible
3	Fairly Feasible
2	Less Feasible
1	Not Feasible

Source: (Ernawati & Sukardiyono, 2017)

After completing the eligibility questionnaire, the data was evaluated using the average formula in the manner shown below:

$$\chi = \frac{\sum x}{n} \quad (1)$$

χ : Mean score
n : Number of questionnaire items
Σx : Total score of questionnaire items

The results of the data analysis on the average score were used to evaluate the feasibility of the developed module based on specific categories, as presented in Table 3 below.

Table 3. Feasibility Criteria

Score	Interval Score	Category
5	>4,2	Very Feasible
4	3,4 < χ ≤ 4,2	Infeasible
3	2,6 < χ ≤ 3,4	Fairly Feasible
2	1,8 < χ ≤ 2,6	Feasible
1	≤ 1,8	Highly Feasible

Description: χ = average score

The module's effectiveness was tested during the implementation and evaluation stages of the ADDIE model through pre-tests and post-tests consisting of 10 multiple-choice questions given to the same class. The results served as the basis for identifying necessary revisions. Effectiveness was analyzed by examining the significance of score differences using the N-gain test to measure students' learning improvement. The N-gain formula is as follows:

$$n - gain = \frac{Post\ Test\ Score - Pre\ Test\ Score}{Ideal\ Score - Pre\ Test\ Score} \quad (2)$$

Description:

Post-test score : Final test score

Pre-test score : Initial test score

Ideal score : The highest possible score in the N-gain category (The ideal score in this study is 100)

The calculated N-gain score is then interpreted according to the effectiveness classification presented in Table 4.

Table 4. N-gain Effectiveness Interpretation Categories

Interval Score	Category
g > 0.7	High
0.3 ≤ g ≤ 0.7	Medium
0 < g < 0.3	Low
1,8 < χ ≤ 2,6	Less Feasible
g ≤ 0	Failed

Source: Wahab et al., 2021.

Based on Table 4, if students' learning outcomes improve between the pre-test and post-test and the N-gain value reaches a minimum of 0.3 (medium category), the module is considered effective.

C. RESULT AND DISCUSSION

1. Module Design

In the analysis stage, observations and interviews showed that learning materials were limited, most references were in English, and no module specifically met students' needs. The learning process remained lecture-centered, causing low student engagement and difficulty in independent study. These findings supported the need to develop a CTL-based digital module (PDF format) accessible via mobile and computer devices. Each chapter included pedagogical components such as a concept map, apperception, learning objectives, student activities, assessments (multiple-choice, essay, and case study), reflection, and enrichment. The module was designed as a CTL-based digital resource that integrates analytical thinking through coding-related activities. Visually, it featured an illustrative cover, accounting-themed icons, and a consistent layout, as shown in Figure 1.

Figure 1. CTL Teaching Module Cover Design

2. Implementation and Evaluation Stage

Feedback suggested adding more practice questions, answer keys, larger images, and consistent fonts. The evaluation stage included expert validation and student feedback analysis, yielding average scores of 78 (material), 63 (media), and 47 (language). These results indicate that while the content was adequate, visual and linguistic aspects required further improvement. Student feedback confirmed these results, recommending the addition of contextual exercises, a clearer glossary, and enhanced visual design. These findings align with Rohmawati (2015), Nasution (2016), and Suci (2020), who emphasized that learning effectiveness depends on the achievement of learning objectives, active student engagement, and optimal resource utilization. Therefore, evaluation was conducted to ensure the module's feasibility for classroom implementation with continuous improvement (Bhakti, 2017 ; Muryadi, 2017 ; Safitri et al., 2020)

3. Feasibilty Analysis

The feasibility test was conducted through expert validation. The validation process of the CTL-based module for the productive accounting subject at SMK Negeri 2 Trenggalek involved material, media, and language experts, as well as 36 students as end users. The involvement of multiple evaluators aimed to assess the module from content, linguistic, media, and practical perspectives. This is consistent with Handayani et al. (2018), who stated that validation serves to gather constructive feedback from multiple parties, and Astawa and Permana (2020), who emphasized that validation ensures learning media meet quality standards.

The material validation results showed an average score of 78, categorized as highly feasible (Table 1). The methodological aspect scored 38 (average 4.22), and the evaluation aspect averaged 3.63, both within the highly feasible range. Overall, the average material validation score of 3.9 indicates that the module aligns well with learning objectives and supports competency achievement. This finding supports Nida et al. (2020), who state that effective instructional materials must align with learning goals and learners' needs. Thus, the CTL-based module developed in this study is considered an effective learning medium that meets key criteria of instructional design, relevance, and contribution to students' conceptual and practical skill development.

Table 5. Results of Material Expert Validation

No	Validator	Evaluated Aspects		Total Score
		Method	Evaluation	
1	Validator 1	36	40	76
2	Validator 2	40	40	80
	Average	38	40	78

The material expert validation produced highly positive results across three aspects: module organization (average 4.44, "feasible"), text design (3.75, "fairly feasible"), and image design (4.00, "feasible"). The overall average score of 4.2 categorized the module as "feasible." These findings indicate that the module demonstrates good quality in structure, content presentation, and visual design, making it suitable for classroom implementation to test its effectiveness in enhancing students' conceptual and practical accounting skills..

These findings confirm that the CTL-based learning module is suitable for use in accounting instruction, although the textual and visual design aspects still require refinement to ensure an optimal learning experience. This aligns with Fika and Sukmawarti (2022), who stated that the validation process determines whether a module aligns with learning objectives and learner characteristics, making it suitable for classroom implementation. The results of the media expert validation are presented in Table 6.

Table 6. Results of Media Expert Validation

Validator	Evaluated Aspects			Total Score
	Module Organization	Text Design	Picture Design	
Validator 1	38	15	8	61
Validator 2	42	15	8	65
Average	40	15	8	63

The language validation achieved a total score of 48, with an average of 4.36, categorized as "highly feasible." The module's language was considered clear, communicative, and suitable for the literacy level of vocational high school students. This indicates that the module not only conveys content effectively but also connects accounting concepts to real-world contexts. This finding aligns with Panjaitan et al. (2020) who stated that language validation assesses grammar, terminology, and sentence structure. The results of the language expert validation are shown in Table 7.

Table 7. Results of Language Expert Validation

No	Validator	Evaluated Aspect	Total Score
		Language Feasibility	
1	Validator 1	48	48
2	Validator 2	48	48
	Average	48	48

Student feedback showed consistent and highly positive responses. The module scored averages of 4.54 for learning media, 4.56 for material, and 4.38 for usefulness, with an overall average of 4.53—categorized as "highly feasible." These results confirm that the CTL-based accounting module meets high feasibility standards from students' perspectives, effectively enhancing both conceptual understanding and practical skills. The module's strong content, visual quality, and relevance make it ready for classroom use without major revisions. This

supports Masykur et al. (2017) who highlight that student perceptions and feedback are key indicators of media effectiveness.

The research findings indicate that the CTL-based Productive Accounting module is highly feasible in terms of material, language, and student response, and feasible in terms of media. With strong validation results and positive feedback, the module is considered effective, practical, and relevant for enhancing accounting learning at SMK Negeri 2 Trenggalek.

4. Effectiveness Test Results

The average pre-test score was 41.38 (range 10–70), indicating low to moderate initial ability. After using the CTL-based module, the average post-test score increased to 86.94 (range 60–100). The N-gain score of 0.774 indicates high effectiveness, showing that the module significantly improved students' conceptual understanding and practical accounting skills.

Effectiveness testing using N-gain analysis showed a significant improvement in student learning outcomes. The average N-gain score was in the High category, demonstrating that the CTL learning module was not only effective in strengthening theoretical understanding of accounting concepts but also had a direct impact on students' mastery of practical skills. This improvement occurred because the module's material was designed to connect theory with real-world work simulations, such as general ledger management and financial statement preparation.

The integration of CTL principles in the module effectively links learning materials with real-life contexts, fostering students' critical thinking, reflection, and learning motivation in accounting. These findings align with previous studies, such as Nurmeli and Idris (2024) who found CTL effective in improving entrepreneurship learning; Wiyono and Krisna Pramundita (2023) who reported that contextual media promote active and meaningful learning; and Jubhari et al. (2022) who confirmed that e-CTL enhances students' critical and creative thinking skills.

In the evaluation phase, 36 students assessed the module based on media, material, and usefulness aspects, obtaining average scores of 4.54, 4.56, and 4.38, respectively—all categorized as "highly feasible," with an overall mean of 4.53. Students expressed positive responses, noting the module's attractive design, clarity, and accessibility, while suggesting minor improvements such as consistent colors, additional case examples, and key notes.

Overall, the CTL-based digital module proved both effective and feasible, enhancing students' understanding and supporting self-directed learning. It also provides a practical alternative for teachers to facilitate project-based or problem-solving approaches, aligning with vocational education needs. This result supports Setiyorini et al. (2016) who emphasized that effective learning media clearly and systematically convey information.

D. CONCLUSION AND SUGGESTIONS

The development of the Contextual Teaching and Learning (CTL)-based productive accounting module using the ADDIE model has produced a highly feasible and effective digital learning resource for vocational students. Validation results from material, media, and language experts, as well as student responses, consistently place the module in the "very appropriate" category, with specific average scores of 4.54 for learning media, 4.56 for material, and 4.38 for usefulness. Beyond these qualitative perceptions, the module's effectiveness is objectively demonstrated by a significant increase in student learning outcomes; the average student score rose from a pre-test mean of 41.38 to a post-test mean of 86.94. This improvement is further validated by an N-gain score of 0.774, which categorizes the module's impact as "High".

Suggestions for future researchers are that they need to develop similar modules in other subjects so that the CTL approach can be applied more widely, not only using lecture methods, but also encouraging discussion, problem solving and contextual practice as well as linking the contents of the module with practical accounting experiences in the world of work.

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