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The Implementation Of The Drill And Practice Method To Improve Students' Learning Activities And Learning Outcomes In Computerized Accounting Spreadsheet Subject Among Grade X Students Of Smkn 14 Jakarta

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Abstract

This classroom action research aimed to improve students' learning activities and learning outcomes in the Computerized Accounting Spreadsheet subject through the Drill and Practice method. The study was conducted in class X AKL 1 at SMK Negeri 14 Jakarta and focused on spreadsheet formulas and functions, including IF, nested IF, AND, OR, VLOOKUP, and HLOOKUP. The research was implemented in two cycles, each consisting of planning, action, observation, and reflection. Data were collected using a learning activity questionnaire, practical spreadsheet tests, and documentation. The questionnaire consisted of 20 Likert-scale items covering attention to learning, activeness in following exercise stages, seriousness, independence, initiative to ask questions, discipline, and response to feedback. The data were analyzed using quantitative descriptive analysis. The results showed that students' learning activity increased from 67.4% in Cycle I, categorized as active, to 82.0% in Cycle II, categorized as highly active. Learning mastery also increased from 40.0% in the pre-cycle to 66.7% in Cycle I and 88.0% in Cycle II. The average score increased from 72.4 in the pre-cycle to 78.7 in Cycle I and 85.0 in Cycle II. These findings indicate that structured, repeated, and feedback-based practice helped students understand spreadsheet procedures, improve accuracy, and develop more consistent working habits. Therefore, the Drill and Practice method can be used as an alternative instructional strategy for procedural and practice-based spreadsheet accounting learning.

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1. INTRODUCTION

Vocational education is expected to develop not only conceptual understanding but also practical skills that can be applied in workplace-related contexts. In the Accounting and Financial Institution program, the ability to process data using spreadsheet software is an important competency because it is closely related to recording, processing, calculating, and presenting financial information. In the Computerized Accounting Spreadsheet subject, students are required to read instructions, enter data, determine appropriate formulas, select cell references, and check calculation results accurately.

Learning activities and learning outcomes are two essential indicators of instructional success. Learning activity reflects the extent to which students are involved in the learning process, while

learning outcomes reflect the achievement of predetermined competencies. Student engagement is considered important because students who pay attention, ask questions, discuss, practice, and correct their work tend to have better opportunities to achieve the expected competencies (Ahmadi et al., 2023; Fitrianti & Hidayati, 2025). In spreadsheet learning, low activity is often visible when students hesitate to try formulas, wait for teacher directions, or do not recheck formula errors independently.

The Computerized Accounting Spreadsheet subject has procedural, technical, gradual, and accuracy-oriented characteristics. The material cannot be mastered only through theoretical explanation; it requires direct and repeated practice. Pangestuti and Asmawan (2025) found that students' difficulties in accounting spreadsheet learning were related to computer operation and memorizing spreadsheet formulas. This condition indicates that students need an instructional strategy that provides systematic practice, immediate feedback, and opportunities to correct mistakes.

The Drill and Practice method is relevant to these needs because it emphasizes repeated, directed, and continuous exercises to strengthen students' procedural mastery. Habibi and Ginting (2025) explained that Drill and Practice requires students to carry out structured and consistent exercises so that the stimulus-response relationship becomes stronger. Similarly, Raksanegara, Nurjanah, and Dahlan (2023) emphasized that repeated practice accompanied by feedback helps students identify errors and improve their skills. In accounting-related learning, Yarisma and Suci (2023) and Hardianti (2023) also reported that Drill and Practice contributed positively to students' activity and achievement. These empirical findings are consistent with the results of the present study, which likewise confirm that structured, repeated practice accompanied by immediate feedback strengthens students' engagement and achievement in procedural, practice-based subjects such as computerized accounting spreadsheets.

Based on the preliminary condition of class X AKL 1 at SMK Negeri 14 Jakarta, students' practical spreadsheet achievement had not reached the expected level. Of 35 students in the pre-cycle, only 14 students, or 40.0%, achieved the minimum mastery criterion of 80, while 21 students, or 60.0%, had not achieved it. This condition showed the need for an instructional action that could improve both students' learning activity and practical learning outcomes.

Although previous studies have discussed the effectiveness of Drill and Practice in several subjects, classroom-based evidence in the context of vocational computerized accounting spreadsheet learning is still limited. Specifically, most prior studies examined Drill and Practice in subjects emphasizing memorization or single-step procedures, such as language learning or basic arithmetic, whereas empirical evidence on its application to multi-step, logic-based spreadsheet tasks that require combining several functions simultaneously, particularly within vocational accounting education, remains scarce. The novelty of this study lies in applying Drill and Practice to spreadsheet accounting tasks that require the combined use of logic and lookup functions. Therefore, this study aimed to analyze the implementation of the Drill and Practice method to improve students' learning activities and learning outcomes in the Computerized Accounting Spreadsheet subject among grade X students of SMK Negeri 14 Jakarta.

2. METHOD

This study used Classroom Action Research because the main purpose was to improve the ongoing learning process in the classroom through planned action, observation, and reflection. The action research was conducted in two cycles. Each cycle consisted of four stages: planning, action,

observation, and reflection (Sary & Dina, 2023). The approach was supported by quantitative descriptive analysis to measure the increase in learning activity and learning outcomes.

The research was conducted at SMK Negeri 14 Jakarta in class X AKL 1. The research subjects consisted of 36 students. In the pre-cycle, the analyzed data involved 35 students. During the study, one transfer student joined the class, so the number of subjects became 36 students. In Cycle I, 33 students attended and took the practical test, while in Cycle II, 25 students attended and took the practical test. The difference in attendance was recorded as part of the classroom condition and was considered when interpreting the results. This decrease in the number of participants between cycles, caused by unresolved student absences, means that the mastery percentages for Cycle I and Cycle II were calculated from different denominators (33 and 25 students, respectively) rather than from a fixed cohort. Consequently, the reported increase in learning outcomes reflects both the effect of the Drill and Practice intervention and, to some extent, a smaller and more consistently participating group being assessed in Cycle II; this limitation was taken into account when interpreting the magnitude of the improvement.

The learning action was the implementation of the Drill and Practice method on spreadsheet logic and lookup functions, including IF, nested IF, AND, OR, VLOOKUP, and HLOOKUP. The learning process was carried out through brief explanation, demonstration of working procedures, guided practice, repeated practice, independent practice, immediate feedback, and evaluation. The teacher demonstrated how to analyze the problem, select the appropriate function, write the formula syntax, determine cell references, and check the final results.

Table 1. Research Design and Instruments

Component	Description	Data Source
Research type	Classroom Action Research in two cycles	Planning, action, observation, and reflection
Learning action	Drill and Practice through guided, repeated, and independent exercises	Spreadsheet learning activities
Learning activity	20-item Likert questionnaire covering seven indicators	Students at the end of each cycle
Learning outcomes	Practical spreadsheet test with a minimum score of 80	Pre-cycle, Cycle I, and Cycle II
Analysis	Quantitative descriptive analysis using percentages	Questionnaire scores and practical test scores

Source: processed by the author (2026).

The data were collected using a learning activity questionnaire, practical spreadsheet tests, and documentation. The learning activity questionnaire consisted of 20 items with a four-point Likert scale. The indicators included attention to learning, activeness in following exercise stages, seriousness in completing exercises, independence in practice, initiative to ask questions, discipline in learning, and response to feedback. The practical test was used to measure students' ability to complete spreadsheet tasks based on formula accuracy, output accuracy, and neatness of the worksheet.

The questionnaire had been validated before use. The validity test showed that all 20 items were valid because the item-total correlation values were higher than the r-table value of 0.329. The reliability test produced a Cronbach's Alpha value of 0.899, indicating that the questionnaire had good internal consistency. The normality test on the total questionnaire score showed a Shapiro-Wilk significance value of 1.000, indicating that the data were normally distributed. These results showed that the questionnaire was appropriate for measuring students' learning activity.

Table 2. Summary of Questionnaire Validation

Instrument Aspect	Result	Interpretation
Item validity	20 items were higher than r-table = 0.329	All items were valid
Reliability	Cronbach's Alpha = 0.899	Reliable
Normality	Shapiro-Wilk Sig. = 1.000	Normally distributed

Source: processed by the author (2026).

The data were analyzed using quantitative descriptive analysis. The percentage of learning activity was calculated by dividing the obtained score by the maximum possible score and multiplying it by 100%. The percentage of learning mastery was calculated by dividing the number of students who achieved the minimum score of 80 by the number of students who took the test and multiplying it by 100%. The action was considered successful when students' learning activity increased and at least 80% of the students who participated in the test achieved the minimum mastery criterion.

3. RESULTS AND DISCUSSION

3.1 Initial Condition

The initial condition showed that students' learning activity had not been optimal. Some students did not fully pay attention to the teacher's explanation, tended to wait for direct guidance before trying exercises, and had limited initiative to recheck formula errors. Students also showed difficulty in determining appropriate formulas, selecting cell references, and checking the accuracy of outputs. The pre-cycle practical test results confirmed that the majority of students had not achieved the minimum mastery criterion.

Table 3. Pre-Cycle Learning Outcomes

Score	Criteria	Number of Students	Percentage	Category
>= 80	Complete	14	40.0%	Very low
< 80	Incomplete	21	60.0%	-
Total	-	35	100%	-

Source: pre-cycle test results processed by the author (2026).

3.2 Cycle I

In Cycle I, the Drill and Practice method was implemented through guided practice, repeated practice, independent practice, and feedback. Students began to follow the stages of practice more consistently. However, several problems remained. Some students were still inaccurate in writing spreadsheet formulas, determining the appropriate function, and selecting the correct range or cell reference. Frequent errors included formula syntax errors, incorrect range selection in lookup functions, and misunderstanding of true and false conditions in IF formulas.

The learning activity questionnaire in Cycle I obtained a total score of 1,780 out of a maximum score of 2,640, or 67.4%, which was categorized as active. The practical test showed that 22 of 33 students, or 66.7%, achieved the minimum mastery criterion, with an average score of 78.7. This result indicated improvement compared with the pre-cycle condition, but the classical mastery target of 80% had not yet been achieved. Therefore, the research continued to Cycle II.

3.3 Cycle II

Cycle II was designed based on the reflection of Cycle I. The improvements included clearer instructions, examples of common formula errors, stronger emphasis on nested IF, AND, OR, VLOOKUP, and HLOOKUP, and more direct feedback during practice. The teacher did not immediately provide final answers; instead, students were guided to locate errors and revise their

formulas. This strategy encouraged students to become more independent and more confident in completing spreadsheet tasks.

The learning activity questionnaire in Cycle II obtained a total score of 1,640 out of a maximum score of 2,000, or 82.0%, which was categorized as highly active. The practical test showed that 22 of 25 students, or 88.0%, achieved the minimum mastery criterion, with an average score of 85.0. These results indicated that the success indicators had been achieved.

Table 4. Comparison of Learning Activity Indicators

Learning Activity Indicator	Cycle I	Cycle II	Increase
Attention to learning	70.1%	84.0%	13.9%
Activeness in following exercise stages	68.2%	82.0%	13.8%
Seriousness in completing exercises	72.0%	86.0%	14.0%
Independence in practice	65.2%	80.0%	14.8%
Initiative to ask questions	62.1%	78.0%	15.9%
Discipline in learning	68.9%	83.0%	14.1%
Response to feedback	65.9%	82.0%	16.1%
Average	**67.4%**	**82.0%**	**14.6%**

Source: questionnaire data processed by the author (2026).

Table 5. Comparison of Learning Outcomes

Stage	Students Taking Test	Complete	Incomplete	Mastery Percentage
Pre-cycle	35	14	21	40.0%
Cycle I	33	22	11	66.7%
Cycle II	25	22	3	88.0%

Source: practical test results processed by the author (2026).

Table 6. Average Score Development

Stage	Average Score	Description
Pre-cycle	72.4	Below the minimum mastery criterion
Cycle I	78.7	Improved but not yet classically complete
Cycle II	85.0	Classically complete

Source: practical test results processed by the author (2026).

3.4 Discussion

The results showed that the implementation of the Drill and Practice method improved students' learning activities. The average learning activity increased from 67.4% in Cycle I to 82.0% in Cycle II. This increase indicates that structured and repeated exercises encouraged students to become more involved in the learning process. Students became more attentive to teacher explanations, more consistent in following exercise stages, more serious in completing tasks, more disciplined, and more responsive to feedback.

The highest improvements occurred in students' response to feedback and initiative to ask questions. This finding is important in spreadsheet learning because students must be able to identify and correct errors in formulas, cell references, and data ranges. Immediate feedback helped students recognize mistakes quickly and prevented incorrect procedures from being repeated. This finding supports Raksanegara, Nurjanah, and Dahlan (2023), who emphasized that Drill and Practice becomes more effective when repeated exercises are accompanied by correction and feedback.

Students' learning outcomes also improved. Learning mastery increased from 40.0% in the pre-cycle to 66.7% in Cycle I and 88.0% in Cycle II. The average score increased from 72.4 in the pre-cycle to 78.7 in Cycle I and 85.0 in Cycle II. This improvement occurred because students repeatedly practiced using IF, nested IF, AND, OR, VLOOKUP, and HLOOKUP in a structured

sequence. Through repeated practice, students became more familiar with formula syntax, function arguments, cell references, and the process of checking results.

In the context of Computerized Accounting Spreadsheet, the Drill and Practice method is appropriate because the subject requires procedural accuracy and repeated application. Spreadsheet errors often arise from small mistakes such as incorrect cell references, missing parentheses, wrong separators, and inappropriate lookup ranges. The method provides repeated opportunities for students to correct such errors and develop accurate working habits. Therefore, Drill and Practice should not be viewed as mechanical repetition only, but as a guided practice process that strengthens procedural understanding, accuracy, and independence.

The findings are consistent with previous studies showing that Drill and Practice can improve learning outcomes and student engagement (Fahrurrozi et al., 2022; Mahmudah et al., 2022; Tlonaen, 2025; Triani, 2025; Yarisma & Suci, 2023). However, this study contributes a more specific classroom-based application in vocational spreadsheet accounting learning. The method was applied to tasks that combined logic and lookup functions, making it relevant for the development of practical accounting data-processing skills.

This study also has limitations. The number of students attending each cycle was different; 33 students attended Cycle I and 25 students attended Cycle II. Therefore, the findings were interpreted based on students who were present and completed the learning activities and tests in each cycle. Beyond this difference in attendance, the increase in learning outcomes across cycles can be attributed to several interacting factors, including the more explicit modeling of formula-writing procedures introduced in Cycle II, more frequent and targeted feedback that allowed students to correct errors before they became habitual, and a cumulative practice effect in which skills mastered in Cycle I provided a stronger foundation for the more complex tasks in Cycle II. Because these factors occurred simultaneously, this study cannot fully isolate the individual contribution of each one, and the observed gain should therefore be interpreted as the combined effect of the refined instructional design rather than of repeated practice alone. In addition, this study was conducted in one class and focused on selected spreadsheet formulas. Further studies may apply the method to more classes, more spreadsheet topics, or longer instructional periods to obtain broader evidence.

4. CONCLUSION

The implementation of the Drill and Practice method improved students' learning activities in the Computerized Accounting Spreadsheet subject among class X AKL 1 students of SMK Negeri 14 Jakarta. Learning activity increased from 67.4% in Cycle I, categorized as active, to 82.0% in Cycle II, categorized as highly active. This improvement was reflected in students' attention to teacher explanations, activeness in following exercise stages, seriousness in completing exercises, independence, initiative to ask questions, discipline, and response to feedback.

The Drill and Practice method also improved students' learning outcomes. Learning mastery increased from 40.0% in the pre-cycle to 66.7% in Cycle I and 88.0% in Cycle II. The average score increased from 72.4 in the pre-cycle to 78.7 in Cycle I and 85.0 in Cycle II. These results indicate that Drill and Practice can be used as an alternative instructional strategy for procedural and practice-based spreadsheet accounting learning, especially for the use of IF, nested IF, AND, OR, VLOOKUP, and HLOOKUP.

Teachers are encouraged to apply the method through gradual exercises, direct demonstration, immediate feedback, and independent practice. Schools may also support this method by providing adequate computer laboratory facilities and sufficient practice time so that students can develop accuracy and confidence in using spreadsheet formulas.

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