EVALUATING LEARNING GAINS IN FINANCIAL ACCOUNTING EDUCATION: A PRE-POST LEARNING ASSESSMENT AMONG FAR210 STUDENTS

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Abstract. Financial accounting courses are one of the courses that require students to have a deep level of understanding and the ability to solve technical problems at a very high level. It is a big challenge for educators, especially at the university level, to determine whether students have mastered the skills required in this course. This study assessed the level of student skills related to understanding in the financial accounting course by looking at the results before and after learning for the course code FAR210, which is Financial Accounting 3 at the Diploma level. The study on 236 students wanted to see the extent of their strategies and level of understanding before and after the strategies was used in class by the lecturers. This assessment included their level of readiness and understanding of accounting concepts and their confidence in solving problems related to financial accounting calculations based on accounting standards. Reliability tests, descriptive statistics, and paired sample t-tests were conducted to assess whether there were significant differences between students' pre- and post-learning views. The results of the study proved that students felt their confidence level increased and higher understanding could be achieved after completing this course especially in solving accounting problems based on calculations. The results of the study also proved that the teaching techniques used by lecturers which were more systematic and continuous practice contributed to positive results among students. This study also highlighted the value of pre-learning assessment as a realistic diagnostic tool for lecturers to track student progress and evaluate teaching performance in financial accounting education.
Keywords: *accounting education, financial accounting, learning assessment, pre–post evaluation, undergraduate students*

Introduction

Financial accounting is an essential component of most accounting curricula in higher education (Derrouich et al., 2025; Almagtome et al., 2019). This course teaches students about financial reporting, accounting standards, and how to formulate financial statements in accordance with those standards. Students must attain these accounting abilities before pursuing professional employment in accounting, auditing, or finance. Despite its importance, financial accounting is typically deemed as one of the most difficult subjects for university students. This course necessitates conceptual comprehension and the capacity to apply technical rules to numerical computations. Many students battle to harness accounting ideas to real-world problems. Recognition, measurement, and categorisation of financial transactions can be confusing concepts for students new to accounting (Lubbe and Bardien, 2025). At the same time, accounting exercises sometimes entail intricate computations that need thorough interpretation of data. These problems underscore the need of excellent teaching strategies that help students understand throughout the learning process. Goss (2022) and Mejía-Rodríguez and Kyriakides (2022) emphasise the need of systematically assessing learning

outcomes at the university level. Final exams, while a common way to gauge what students know at the end of a class, don't always show how much they've learned as they went along. Because of this, teachers might not really know how much attending classes, working in groups, and doing other learning activities has helped students grasp the material. It may be too late to assess the level of students' skills and understanding if we only wait for the final exam results to implement effective teaching strategies.

When educators want to figure out if students are learning, they often use a method called pre-post learning evaluation (Wykowski and Starks, 2025). This involves the process of reviewing what students know, think and feel confident about before and after they go through the learning experience in the classroom. Lecturers can see and know whether the teaching and learning process practiced is effective and brings a significant difference through the answers students give from one point to another. Through this method, lecturers can identify those among the students who need help and then think of the best strategies to improve students' skills and understanding. In this particular study, a pre-post-test was used to assess student performance in the Financial Accounting course, FAR210, at Universiti Teknologi MARA (UiTM). This is a foundation course for accounting students in their third semester, and it covers the main ideas in financial reporting and how to solve related problems. It is also the first step towards understanding Accounting Standards. In addition, this course delves into the conceptual framework and Malaysian Financial Reporting Standards (MFRS). It is very important for lecturers to know whether students have really improved throughout the course to measure how well the teaching and learning process is working for everyone involved. The objective of this study is to see if students' views of comprehending financial accounting concepts and computations improve after taking the FAR210 course. These findings are intended to contribute to the accounting education literature by giving empirical data on the progression of learning in a financial accounting course using a variety of teaching approaches that are deemed acceptable for this topic.

Literature review

Accounting education and student learning

Over the last few decades, accounting education has changed a lot because universities want to give students both the book smarts and the hands-on abilities, they need to stay current and meet what businesses are asking for (Giang, 2024; Tavares et al., 2023). The business world has become more complex, and accounting work has changed, pushing accounting professionals away from old ways of learning and toward new ones. As a result, teaching and learning have been updated to include not only technical accounting topics but also skills that can be applied anywhere, such as critical thinking and problem-solving. Recent researchers have found that in order to learn accounting, students need to be able to think critically about financial information (Sargent and Winton, 2023; Terblanche and De Clercq, 2021). Unlike many other business courses, accounting requires students to think critically about accounting concepts. In addition, they also need to deal with numbers, which is a unique challenge for those who are not interested in calculations, especially at the university level. Studies from before having shown that lots of things can impact how well students learn in accounting classes, such as the study materials, how much students participate, and how the teachers teach (Uygur, 2025; Precourt and Gainor, 2019; Jackling, 2015). The teacher's role has been pointed out as important for making sure students have a good

learning experience. Using student-involved teaching methods, such as problem-based learning and guided exercises, has been shown to help students understand complex accounting concepts (Darling-Hammond et al., 2020). This approach dynamically retains students and permits them to use what they have learned in the classroom in a more practical way. Similarly, organized help sessions allow students to try out accounting ideas in real-life scenarios, which helps them better understand and remember key topics.

Students often complain that they struggle to understand financial accounting courses. Previous studies have shown that subjects such as financial accounting are technical subjects and require a high level of understanding in line with the level of difficulty in the university syllabus. Previous researchers have found evidence that students have difficulty applying theoretical knowledge gained in class to the real world of business (Sargent and Winton, 2025; Myers, 2016). Lack of confidence when doing accounting mathematics, especially when they are faced with complex and unexpected problems, has also been found by previous researchers. This only goes to show how important it is for lecturers to continuously review whether their teaching methods in the classroom are helping students learn and change things if not faster.

Pre-post learning assessment

A normal practice is by giving the students a test before and after they have learned something and through that way we can determine whether they learn anything new, like knowledge and skills or not. This is often done in studies about education to track changes (Qiu et al., 2025; Castaneda et al., 2023). You gather information before and after a learning activity and then compare the two sets of results to see if there's a real difference. Through the methods used, lecturers will be able to identify whether the teaching strategies used lead to optimal learning. Lecturers need to know the ability level of their students and adapt appropriate methods to produce high-quality and effective teaching. Lecturers can assess the changes before and after students in terms of their understanding and competence in taking an accounting course (Norwani et al., 2025; Ahmad Tarmizi et al., 2023; Omar et al., 2023; Abou-El-Sood and Ghoniem, 2022). For example, students may feel less confident in understanding financial accounting concepts or performing financial accounting calculations. After attending a class and receiving appropriate assistance, they may feel more confident because they have a better handle on the course. This, in turn, will help them to apply the knowledge gained in class to answer upcoming exam questions. The use of pre- and post-assessment has several advantages (Wykowski and Starks, 2025). For one, it is a simple and systematic way to check how well students have learned a certain content in a financial accounting course. Second, it helps lecturers determine which topics students most often find difficult in the course material. Finally, the results of the study can be used to improve teaching methods or strategies that are more effective. Through this method, lecturers can determine what makes students struggle in learning a financial accounting course.

Learning gains in accounting couses

Learning gains refer to the improvement in students' knowledge, skills, or confidence that occurs because of educational experiences. Measuring learning gains is important because it provides evidence about the effectiveness of teaching practices and

course design. In accounting courses, learning gains may be reflected in students' improved ability to understand financial reporting concepts, analyse accounting information, and perform technical calculations. These improvements are important to prepare students for both academic achievement and future professional careers in accounting and related professions. Additionally, assessing learning outcomes allows educators to identify areas where university students may need additional assistance or intervention. Teaching and learning outcomes will be measured in terms of students' competence and the changes they perceive themselves to have. In addition, performance will be measured periodically to determine the effectiveness of a teaching and learning method or process. While examination scores provide an objective indication of learning outcomes, self-perception measures can also offer valuable insights into students' confidence and readiness to use accounting knowledge. Assessing student progress and how they develop during the course can be assessed through a combination of perspectives applied in the classroom. Cognitive and emotive aspects in the teaching and learning process can be generated by lecturers through the methods used. With this, it can strengthen the validity of data results about student growth and teaching effectiveness.

Financial accounting, which is technical in nature, can assess learning gains through structured assessment tools (Susanti and Yuhendri, 2024; Motsoeneng and Moreeng, 2022). It can help lecturers determine whether students have achieved the required competencies. Therefore, this study used pre-post learning assessments to examine how students' perceptions of their knowledge and readiness in financial accounting courses changed after completing the FAR210 course. This technique allows for a systematic comparison of student learning before and after exposure to course content in the accounting subject (Ahmad et al., 2025). Furthermore, it provides empirical evidence to determine the success of the teaching strategies used by lecturers during the course and the level of student understanding and can be practiced in all accounting-related subjects.

Materials and Methods

This study adopted a quantitative research design with a pre-post-learning assessment approach among FAR210 students (Wykowski and Starks, 2025). The main objective of this study is to assess the improvement in students' understanding of the financial accounting course in accounting concepts and calculations after completing this course. This survey was given to students taking the FAR210 course because this was the first subject they were exposed to learning related to Accounting Standards which challenged the level of understanding and critical thinking required. The questionnaire was conducted at two different points in the semester, namely before the course began and after the course ended. The first survey to identify students' initial perceptions of their understanding was distributed at the beginning. The second survey was conducted after the course ended to find out students' perceptions of the results throughout the course. The respondents consisted of undergraduate students enrolled in the FAR210 Financial Accounting course at a Malaysian public university. This study involved 236 students. To ensure confidentiality in this survey, the survey was conducted on a voluntary basis, and no names were collected in this response. The questionnaire was distributed via an online platform via WhatsApp. This allowed

students to complete the survey easily using their personal devices. The use of online surveys also facilitated efficient data collection and compilation (Putranto, 2019).

A structured questionnaire designed to measure students' perceptions before and after was the instrument used to determine their learning experience in the FAR210 course. The questionnaire included items assessing three main dimensions that contributed to the study results: (1) Readiness for teaching methods, which examined students' perceptions of the learning approaches used during the course. (2) Understanding of theoretical accounting topics, which measured students' confidence in their conceptual knowledge of financial accounting. (3) Understanding of calculation-based accounting topics, which assessed students' confidence in performing accounting calculations and solving numerical problems. All items in this study were measured using a five-point Likert scale ranging from strongly disagrees to strongly agree.

Data collected from a survey of 236 students will be analyzed using statistical techniques in SPSS version 30. This is commonly used in educational research. First, reliability analysis will be conducted to examine the internal consistency of each questionnaire item. To determine whether the instrument show's reliability, Cronbach's alpha value will be calculated. Second, to summarize the student responses in the pre-learning and post-learning surveys, descriptive statistics will be conducted. Each construct will be evaluated through mean score values and standard deviations. Finally, to determine whether there is a significant difference between the pre-learning and post-learning scores, a paired sample t-test will be conducted. This analysis will prove whether there is a significant and meaningful increase in the perception of student understanding before and after completing the course. This statistical approach is very suitable for comparing two samples at different times, namely pre-learning and post-learning (Wykowski and Starks, 2025). Furthermore, the results of the study can provide overall empirical support for the success of the teaching techniques used by the lecturers in the course.

Results and Discussion

Reliability analysis

Reliability analysis was conducted to examine the internal consistency of the questionnaire items. The instrument showed acceptable reliability through the measurement of student perceptions with Cronbach's alpha values for the construct exceeding the recommended threshold of 0.70. These results confirmed that the measurement items in this study for all five variables showed excellent internal consistency. This indicated that the respondents, namely the students of the FAR210 course, interpreted the items consistently for each set of items to reliably represent their respective constructs. As a result, the scale used in this study was deemed robust and suitable for further statistical analysis (Qiu et al., 2025; Susanti and Yuhendri, 2024; Goss, 2022) (*Table 1*).

Table 1. *Cronbach's alpha values.*

Category	No	Items	Cronbach's Alpha
Pre	1	Readiness for teaching methods	.754
	2	Initial understanding of theory-based topics	.969
	3	Initial understanding of calculation-based topics	.950
	4	Prior exposure & readiness for real-world learning	.821
	5	Initial performance confidence	.810
Post	1	Effectiveness of teaching methods	.852

2	Understanding of theory-based topics	.941
3	Understanding of calculation-based topics	.906
4	Performance after learning	.920
5	Learning gain & method impact	.851

Descriptive statistics

The descriptive statistics revealed that students reported moderate levels of understanding before the course began. After completing the course, the average scores increased across all measured dimensions. The improvement was particularly noticeable in items related to calculation-based accounting topics. Descriptive statistics were used to provide an overall view of the respondents' responses for each variable measured in this study (Goss, 2022). *Table 2* summarises the minimum, maximum, mean, and standard deviation for the dependent variable, Learning gain and method impact, and the four independent variables.

***Table 2**. Descriptive statistics.*

No	Variables	Minimum	Maximum	Mean	Standard deviation
1	Readiness for teaching methods	1	5	3.7472	.77954
2	Initial understanding of theory-based topics	1	5	3.8750	.96550
3	Initial understanding of calculation-based topics	1	5	3.9314	.88709
4	Prior exposure & readiness for real-world learning	1	5	3.6091	.79894
5	Initial performance confidence	1	5	3.5523	.80577
6	Effectiveness of teaching methods	1	5	4.0418	.55671
7	Understanding of theory-based topics	1	5	4.1144	.65529
8	Understanding of calculation-based topics	1	5	4.1949	.55900
9	Performance after learning	1	5	4.0240	.66659
10	Learning gain & method impact	1	5	4.2585	.59692

All variables recorded minimum values of 1 and maximum values of 5, indicating that respondents generally provided low to high ratings across all questionnaire items. Regarding central tendency, the mean values for all variables ranged from 3.6091 to 4.2585, suggesting that respondents generally agreed with the statements for each construct. In terms of pre-learning conditions, the mean scores for readiness and initial understanding were moderately high. Specifically, readiness for teaching methods recorded a mean of 3.7472 (SD = 0.77954), while initial understanding of theory-based topics and calculation-based topics showed slightly higher means of 3.8750 (SD = 0.96550) and 3.9314 (SD = 0.88709), respectively. However, prior exposure and readiness for real-world learning (M = 3.6091, SD = 0.79894) and initial performance confidence (M = 3.5523, SD = 0.80577) were comparatively lower, suggesting that respondents had moderate confidence and exposure before the intervention. Following the learning intervention, all post-learning variables showed noticeable improvement. The effectiveness of teaching methods achieved a high mean score of 4.0418 (SD = 0.55671), indicating that respondents generally perceived the teaching approaches as effective (Ahmad et al., 2025; Norwani et al., 2025; Susanti and Yuhendri, 2024; Ahmad Tarmizi et al., 2023; Omar et al., 2023). Similarly, understanding of theory-based topics (M = 4.1144, SD = 0.65529) and calculation-based topics (M = 4.1949, SD = 0.55900) both improved, with the latter showing slightly higher comprehension (Lubbe and Bardien, 2025; Sargent and Winton, 2023; Myers, 2016).

In terms of performance outcomes, performance after learning recorded a mean of 4.0240 (SD = 0.66659), reflecting improved student performance. Notably, the highest mean was observed for learning gain and method impact (M = 4.2585, SD = 0.59692), suggesting that the teaching methods had a strong positive impact on students' overall learning experience. The standard deviation values across all variables ranged from

0.55671 to 0.96550, indicating relatively low variability and suggesting consistent responses among participants. In summary, the findings demonstrate that while students began with moderate readiness, understanding, and confidence, the teaching methods applied in this study significantly enhanced their comprehension, performance, and overall learning gains. This indicates the effectiveness of the instructional approach in improving both theoretical and calculation-based learning outcomes (Ahmad et al., 2025; Norwani et al., 2025; Susanti and Yuhendri, 2024; Houghton, 2023).

Paired sample T-test

The results of the paired sample t-tests indicated that there were statistically significant differences between the pre-learning and post-learning scores. Students reported higher levels of confidence in their understanding of financial accounting concepts and calculations after completing the course (Sargent and Winton, 2025; Giang, 2024; Zieber and Sedgewick, 2018). These findings suggest that the learning activities implemented in FAR210 contributed positively to students perceived learning outcomes (Ahmad et al., 2025; Norwani et al., 2025; Houghton, 2023) (*Table 3*).

Table 3*. Paired-sample comparison.*

No	Variables	Mean difference	Standard deviation	Standard error mean	95% confideence interval: Lower bound
1	Readiness for teaching methods & Effectiveness of teaching methods	-.29415	.66412	.04323	-.37932
2	Pre & post understanding of theory-based topics	-.2394	.9288	.0605	-.3585
3	Pre & post understanding of calculation-based topics	-.2636	.8819	.0574	-.3767
4	Prior exposure & readiness for real-world learning & performance after learning	-.41487	.83673	.05447	-.52218
5	Initial performance confidence & Learning gain & method impact	-.70602	.84485	.05499	-.81436

A paired sample t-test was conducted to evaluate the effectiveness of the teaching methods by comparing pre-learning and post-learning measures across selected variables (Wykowski and Starks, 2025; Persky et al., 2020). The analysis focused on identifying significant differences in students' readiness, understanding, performance, and perceived learning outcomes. The results revealed that all paired variables exhibited negative mean differences, indicating that post-learning scores were consistently higher than pre-learning scores. This pattern suggests that the instructional intervention had a positive effect on students' learning experiences. Specifically, the comparison between readiness for teaching methods and effectiveness of teaching methods yielded a mean difference of -0.29415 (SD = 0.66412, SE = 0.04323), with the 95% confidence interval indicating a consistently negative range (lower bound = -0.37932).

This finding implies that students perceived the teaching methods to be more effective after experiencing them, compared to their initial readiness. For understanding of theory-based topics, the mean difference was -0.2394 (SD = 0.9288, SE = 0.0605), with a lower confidence interval of -0.3585. This suggests a statistically meaningful improvement in students' conceptual understanding following the instructional intervention. Similarly, understanding of calculation-based topics showed a mean difference of -0.2636 (SD = 0.8819, SE = 0.0574), with the confidence interval lower bound at -0.3767, indicating enhanced comprehension in quantitative aspects after learning. The comparison between prior exposure and readiness for real-world learning and performance after learning demonstrated a larger mean difference of -0.41487 (SD

= 0.83673, SE = 0.05447), with a lower bound confidence interval of -0.52218. This result indicates that although students initially reported moderate readiness for real-world application, their performance improved significantly after the learning process.

Notably, the largest mean difference was observed between initial performance confidence and learning gain and method impact (-0.70602, SD = 0.84485, SE = 0.05499), with a lower confidence interval of -0.81436. This substantial difference highlights a pronounced increase in students' confidence and perceived learning gains, underscoring the strong impact of the teaching methods. Importantly, all reported confidence intervals are entirely below zero, suggesting that the differences are statistically significant at the 95% confidence level. This indicates that the improvements observed are unlikely to be due to random variation. As summary, the findings from the paired sample t-test provide strong empirical evidence that the teaching methods employed in this study significantly enhanced students' understanding, performance, confidence, and overall learning outcomes (Ahmad et al., 2025; Norwani et al., 2025; Susanti and Yuhendri, 2024; Houghton, 2023). Therefore, the null hypothesis (H_0), which assumes no significant difference between pre-learning and post-learning measures, is rejected. Conversely, the alternative hypothesis (H_1) is supported, confirming the effectiveness of the instructional approach.

Conclusion

This study examined learning gains among students enrolled in the FAR210 Financial Accounting course using a pre–post learning assessment approach (Wykowski and Starks, 2025; Persky et al., 2020). Based on responses from 236 students, the findings indicate that students reported higher levels of understanding and confidence after completing the course. The results suggest that the teaching strategies implemented in FAR210 contribute positively to students' learning outcomes (Ahmad et al., 2025; Norwani et al., 2025; Houghton, 2023). The combination of lecture structure, tutorial exercises, and problem-solving activities provided throughout the semester (Houghton, 2023). Frequent exposure to accounting problems that occur in a business may have helped students gradually build confidence in applying accounting principles to practical scenarios (Giang, 2024; Sargent and Winton, 2023; De Villiers, 2021). The findings of this study indicate that students experienced measurable learning improvement after completing the FAR210 Financial Accounting course. The increase in post-learning scores suggests that the instructional strategies used in the course helped students develop a stronger understanding of both conceptual and computational aspects of financial accounting. This is in consistent with Nathenson and Henderson (2018) where they found improvement demonstrates the usefulness of matching course materials with appropriate teaching and learning activities. It also shows that students are better able to grasp important accounting ideas throughout the course.

One possible explanation for this improvement is the structured combination of lectures, tutorial exercises, and problem-solving activities provided throughout the semester. Regular exposure to accounting problems may have helped students gradually build confidence in applying accounting principles to practical scenarios (Giang, 2024; De Villiers, 2021). Furthermore, the step-by-step instruction techniques provided by the lecturers during the tutorials have helped students overcome initial challenges with complex topics (Lubbe and Bardien, 2025; Myers, 2016). To help students gain better knowledge and engage more actively in class, an organized learning environment needs

to be implemented (Darling-Hammond et al., 2020). This will to some extent help the teaching and learning process in the financial accounting course. The results also highlight the importance of continuous assessment and feedback in accounting education (Castaneda et al., 2023; Motsoeneng and Moreeng, 2022; Goss, 2022). Students are given the space and opportunity to ask questions to lecturers when they have problems in doing tutorial questions (Precourt and Gainor, 2019). With this, the learning process will be more effective and improve over time. Furthermore, the lecturers' direct response to the questions raised by students will allow students to clarify mistakes before they become entrenched (Nathenson and Henderson, 2018). As a result, it will not only improve their overall learning experience and academic achievement, but the learning sessions will also be more organized and interesting.

Furthermore, the use of pre-learning assessments provides lecturers with valuable insights into the progress of students' learning (Wykowski and Starks, 2025; Goss, 2022; Persky et al., 2020). By comparing responses collected at different stages of the course, i.e. before the start of learning and after the learning, lecturers can assess whether the teaching strategies employed have achieved the desired learning objectives. This technique also enables data-driven changes to be made in the design and delivery of courses, especially financial accounting courses (Motsoeneng and Moreeng, 2022; Goss, 2022). Ultimately, it will enable lecturers to more thoughtfully apply evidence-based teaching and learning approaches and techniques in financial accounting education, especially at the university level (Darling-Hammond et al., 2020). The results of this study have proven that there are several implications for lecturers in financial accounting courses. First, the results of the study prove that pre-post-learning assessments function as a useful diagnostic tool to monitor the level of understanding and readiness of students in learning financial accounting courses (Wykowski and Starks, 2025; Motsoeneng and Moreeng, 2022). Lecturers can use the assessment from the study results to determine which topics require additional explanation to students or appropriate exercises to strengthen their understanding of the course (Lubbe and Bardien, 2025; Myers, 2016). Second, based on the results obtained, students' confidence can be enhanced by combining structured exercises and tutorial discussions in solving accounting problems (Giang, 2024; De Villiers, 2021). This highlights the importance of interactive and comprehensive learning activities that encourage students to actively engage with accounting concepts (Ahmad et al., 2025; Norwani et al., 2025; Precourt and Gainor, 2019). Finally, the approach used in this study can be applied to other financial accounting subjects and also other courses or subjects to evaluate the effectiveness of lecturers' teaching and student learning outcomes, especially at the university level (Goss, 2022). This study also suggests that pre-and post-learning assessments can provide a clearer and more valuable picture of student learning progress, particularly at university level (Wykowski and Starks, 2025; Goss, 2022). A teaching structure based on workplace evidence can support lecturers in evaluating and improving their teaching approaches, as universities continue to emphasize evidence-based teaching practices (Giang, 2024; De Villiers, 2021). Future research could extend this study by incorporating objective performance measures, such as periodic examination scores, or by applying assessment models to other accounting courses (Persky et al., 2020).

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

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