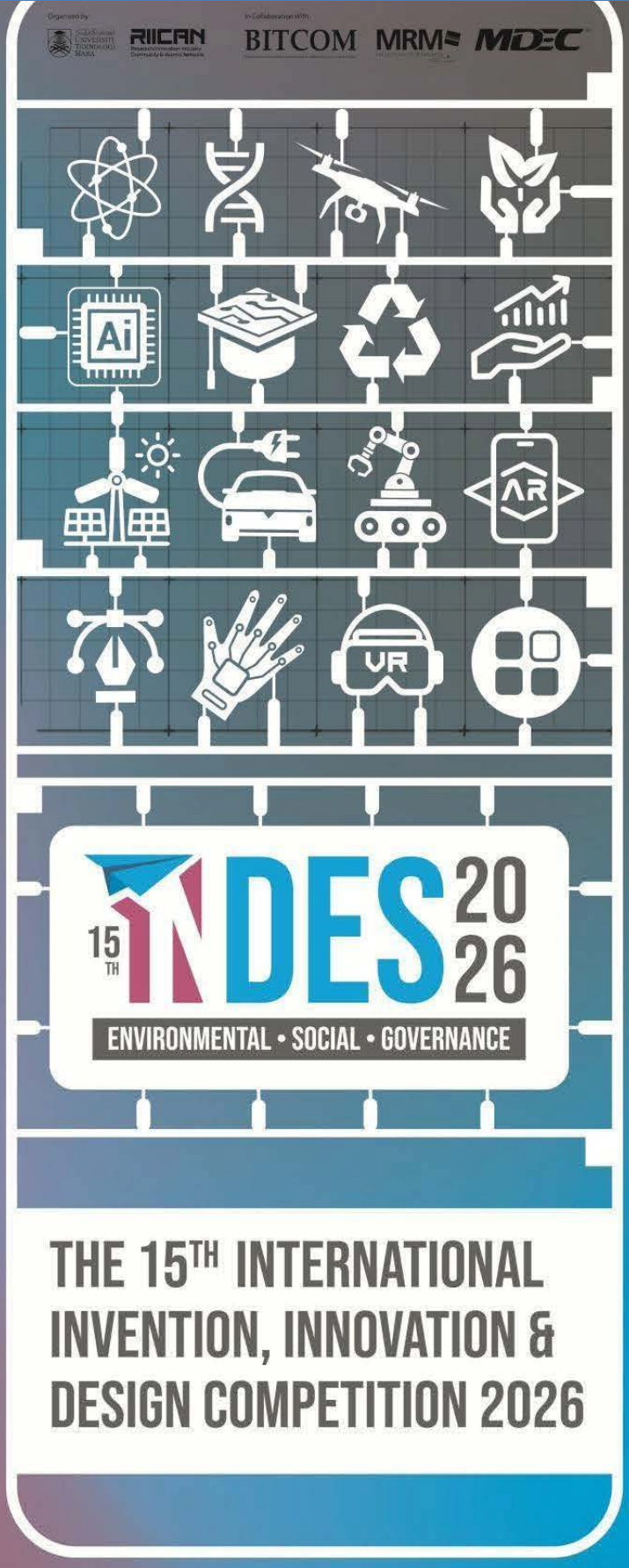

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THE 15th INTERNATIONAL
INVENTION, INNOVATION &
DESIGN COMPETITION 2026

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Office of Research, Industry,
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FAR-LAADS (FINANCIAL ACCOUNTING READINESS & LEARNING ANALYTICS DIAGNOSTIC SYSTEM)

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ABSTRACT

FAR-LAADS (Financial Accounting Readiness & Learning Analytics Diagnostic System) is a data-driven learning diagnostic and decision-support system designed to revolutionise accounting education. Traditional accounting pedagogy often relies on intuition and post-exam post-mortems, leaving a critical gap in real-time understanding of student readiness. This innovation systematically measures student readiness before class and learning outcomes after class to automatically calculate learning gains. By identifying specific topic weaknesses and providing actionable teaching recommendations, FAR-LAADS transforms raw survey data into institutional intelligence. Results from pilot implementations indicate significant potential for enhancing teaching effectiveness, meeting accreditation requirements, and improving student performance through targeted interventions.

Keywords: accounting education, financial accounting, learning assessment, pre-post evaluation, undergraduate students

1. INTRODUCTION

Current accounting education faces systemic challenges in which lecturers lack real-time insight into student preparedness, often identifying learning gaps only after high-stakes assessments (Hu et al., 2025). This reliance on "post-mortem" evaluation means teaching improvements are frequently driven by intuition rather than empirical data, leaving a void in structured systems designed to measure actual learning gains (Dixon et al., 2025). Students often struggle to bridge the gap between theoretical principles and real-world application, particularly regarding the recognition, measurement, and categorisation of financial transactions (Siti et al., 2023). These complexities underscore the need for excellent teaching strategies that support students throughout the entire learning process. While final exams are common, they do not always reflect incremental progress or show how classroom activities helped students grasp the material (Kavanagh & Drennan, 2008). Relying solely on results to implement remedial strategies is often too late for effective intervention (Watson et al., 2011).

To address these deficiencies, **FAR-LAADS (Financial Accounting Readiness & Learning Analytics Diagnostic System)** positions itself as a comprehensive, data-driven diagnostic and decision-support system. Unlike general Learning Management Systems (LMS) that focus on content delivery, FAR-LAADS provides specialised learning analytics and accounting-specific diagnostics, such as identifying difficulties in complex standards like MFRS 116 Property, Plant, and Equipment. The system utilises a pre-post learning evaluation method to review student knowledge and confidence before and after the classroom experience. This allows lecturers to automatically calculate learning gains and identify specific weak accounting topics to provide actionable recommendations. Implemented in the FAR210 course at Universiti Teknologi MARA (UiTM), FAR-LAADS enables lecturers to shift from intuition-based teaching to evidence-based performance tracking, ensuring the educational process is effective and meets accreditation requirements.

2. METHODOLOGY

The methodology of FAR-LAADS is anchored in a specialised four-stage system architecture designed to transform raw educational data into actionable institutional intelligence. The process begins at Stage 1: Data Input, where pre- and post-learning questionnaires and student profiles are collected via web-based tools. This data is funnelled into Stage 2: Processing Engine, which serves as the core innovation by automatically calculating learning gains, detecting topic-specific weaknesses, and generating a readiness index score. The results are then visualised in Stage 3 and ultimately reach Stage 4: Decision Support Output, which generates automated reports and specific teaching recommendations for at-risk students.

This study adopted a quantitative research design utilising a pre-post-learning assessment approach among 236 undergraduate students enrolled in the FAR210 Financial Accounting course at a Malaysian public university. The primary objective was to assess improvements in students' understanding of accounting concepts and calculations, particularly as this course introduces challenging Accounting Standards that require high-level critical thinking. Data collection was conducted at two distinct intervals, at the beginning and the end of the semester, using an anonymous, voluntary online survey distributed via WhatsApp to ensure efficiency and ease of access. This systematic timing allowed the researchers to identify initial perceptions and compare them against the final outcomes to measure the effectiveness of the learning experience.

The research instrument consisted of a structured questionnaire measuring three dimensions: readiness for teaching methods, understanding of theoretical topics, and proficiency in calculation-based accounting. All items utilised a five-point Likert scale and were analysed using SPSS version 30. The analysis included a reliability test via Cronbach's alpha to ensure internal consistency, followed by descriptive statistics (mean and standard deviation) to summarise student responses. Finally, a paired sample t-test was conducted to determine if a significant difference existed between pre-learning and post-learning scores. This statistical approach provides empirical evidence of learning gains and the overall success of the teaching techniques employed throughout the course.

3. FINDINGS

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. These findings suggest that the learning activities implemented in FAR210 contributed positively to students' perceived learning outcomes.

NO	VARIABLES	MEAN	STD DEVIATION	STD ERROR MEAN	95% CONFIDENCE INTERVAL OF THE LOWER
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. 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.

4. CONCLUSION

The results of this study show that FAR-LAADS is a powerful tool for improving how accounting is taught by transforming raw data into clear evidence of progress. By measuring the growth of 236 students in the FAR210 course, the data confirms that students reported higher levels of understanding and confidence after the course was completed. This improvement proves that the combination of structured lectures and step-by-step problem-solving activities effectively helps students master difficult standards like MFRS 116 Property, Plant, and Equipment. By comparing scores from the start and end of the semester, lecturers can see exactly how much students have learned, allowing them to fix mistakes and provide feedback before the final exam.

Looking ahead, FAR-LAADS has great potential as a platform for other business subjects and higher education institutions. It helps universities meet MQA accreditation requirements by providing hard data on teaching effectiveness and student learning gains. Future updates will include AI-powered features to predict student performance and suggest personalized learning paths to further bridge the gap between student struggle and academic success. Ultimately, this system moves accounting education toward a smarter, data-driven future where teaching quality is not just assumed but proven through real-time insights.

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