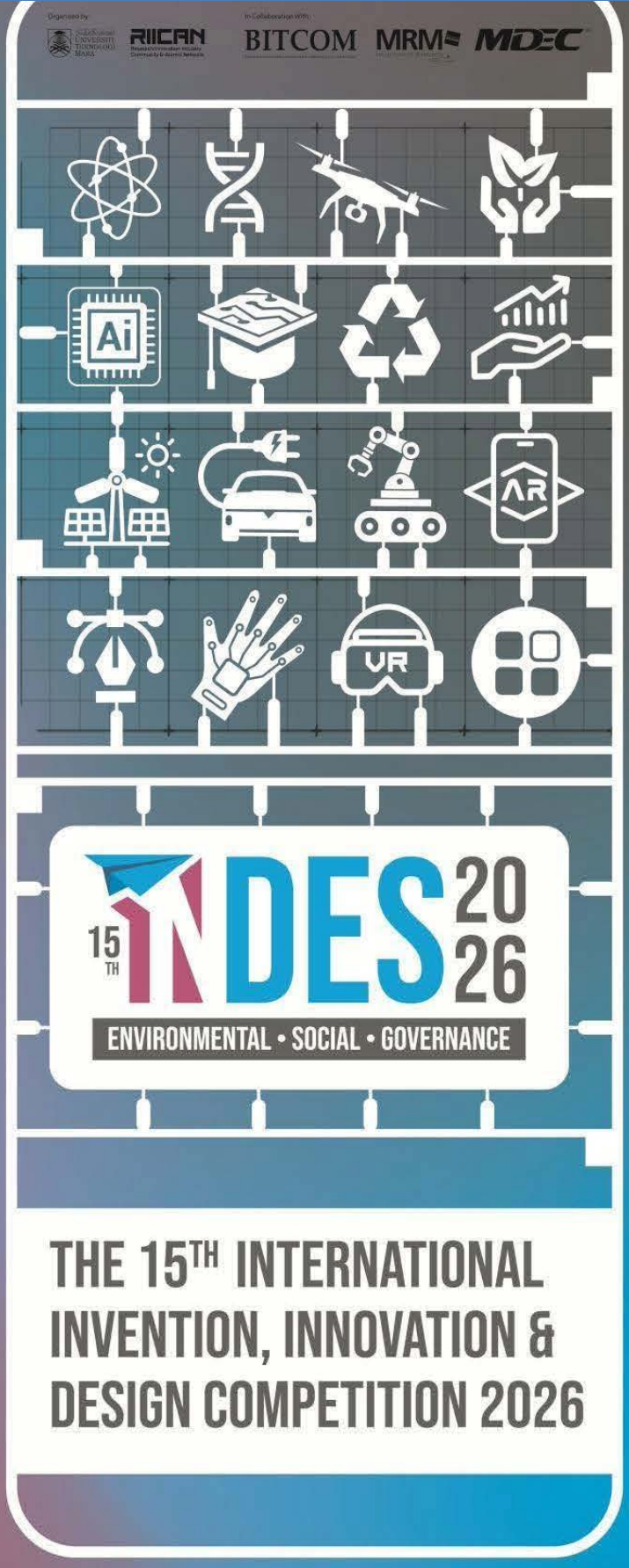


E-BOOK OF

EXTENDED ABSTRACT

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THE 15th INTERNATIONAL
INVENTION, INNOVATION &
DESIGN COMPETITION 2026

Organized by:
Office of Research, Industry,
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UiTM Perak Branch

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ENHANCING STUDENT ENGAGEMENT THROUGH AI-ASSISTED ANALYSIS OF PAST-YEAR QUESTIONS USING CANVA WHITEBOARD

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ABSTRACT

Student participation is vital for effective learning, especially in technical fields like Construction Technology. Current revision techniques, which often rely on old exam papers, tend to make students passive. This study investigated how incorporating AI tools and digital collaboration platforms would boost student engagement. Using a mono-method approach, the study involved undergraduate Construction Technology students. AI tools analyzed past exam questions to pinpoint key concepts and helped structure answers. These insights were then used in interactive learning sessions on Canva Whiteboard, where lecturers guided students through brainstorming, discussions, and Questions and Answer (Q&A). Data were gathered via subjective answers, classroom observations, and academic performance reviews. The expectation was that this approach would lead to increased student engagement, higher participation, and a deeper grasp of concepts and question's verbs towards students' readiness facing the Final Examination. Ultimately, the study suggests that AI-supported collaborative learning effectively transforms traditional revision into a more active, student-focused experience.

Keyword: Student Engagement, Artificial Intelligence, Past-Year Questions, Design Thinking Framework, Canva Whiteboard

1. INTRODUCTION

Student engagement is a crucial factor in ensuring effective teaching and learning in higher education. In technical disciplines like construction technology, students commonly use past examination papers for revision, but such traditional methods often result in passive learning and minimal interaction. With the rise of artificial intelligence (AI) and digital educational tools, there is growing potential to transform conventional revision practices into more dynamic and participatory learning experiences. This study explores how combining AI-driven analysis with collaborative digital platforms to improve student engagement.

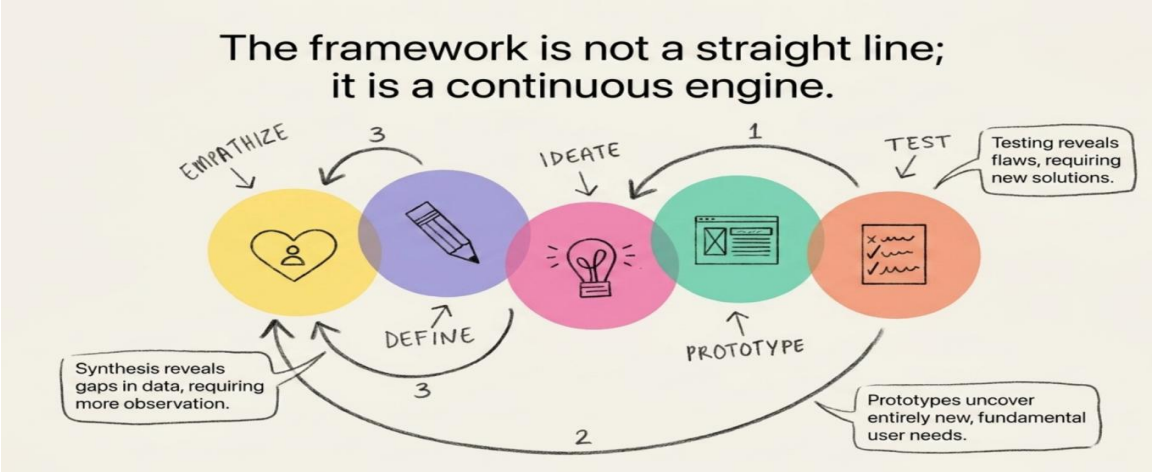


Figure 1 Design Thinking Framework

The framework shown in Figure 1 characterizes design thinking as a non-linear cycle focused on incremental enhancement rather than a rigid procedure. It involves linking five core stages, which are empathize, define, ideate, prototype, and test via active feedback loops. This iterative nature is specifically advantageous for construction technology education, which involves linking the gap between abstract theory and hands-on site application. In this educational context, the empathize phase allows instructors to pinpoint specific student hurdles regarding complex construction sequences and material properties. Next, these insights are refined into actionable learning objectives during the 'define' stage. Proceeding after this, the ideation phase encourages the exploration of diverse pedagogical tools, ranging from digital simulations to real-world case studies using video simulations for topics that have been learned. Prototyping then translates these concepts into physical learning aids, such as virtual site visits, which are subsequently scrutinized during the testing phase, resulting in student outcomes. Most importantly, the framework recognizes that testing and development often reveal knowledge gaps that were not apparent before, which leads to going back to earlier stages to make improvements to the question's verb. This cyclical progression ensures that instructional strategies remain dynamic and responsive. Ultimately, the model fosters a versatile, student-centered atmosphere that bolsters engagement, sharpens practical problem-solving capabilities, and fosters innovative ways of thinking strategies essential for the construction industry.

2. METHODOLOGY

This research utilized a mono-method designed for preliminary research, integrating qualitative data to assess how AI-driven learning sessions impacted student involvement. The sample group comprised undergraduate students from UiTM specializing in construction technology and diploma level. A specific cohort was chosen to take part in the lecturer-led intervention. The study employed a teaching strategy that combined AI capabilities with Canva Whiteboard, with a set of questions provided for each topic. The procedural steps included using AI to deconstruct previous exam papers. The next step involved pinpointing core subjects and organizing response frameworks. Consequently, the next process was engaging in collective ideation via digital whiteboards. Then, answers were gathered in writing on sticky notes with participation through guided and interactive Q&A. Finally, shared group outcomes were presented through formal presentations. By benchmarking against the Design Thinking Framework, the answers on the whiteboard were gathered through primary channels to measure student levels of engagement, and it covered every topic in the syllabus. Meanwhile, observation techniques using checklists were used to track real-time interaction and participation to get more subjective answers to the questions per topic in the syllabus. Importantly, evaluation of performance shifts was also compared before and after the intervention from week 1 to week 14. Finally, qualitative feedback was carried out using thematic analysis to uncover recurring trends and insights within student responses, as shown in Figure 2.

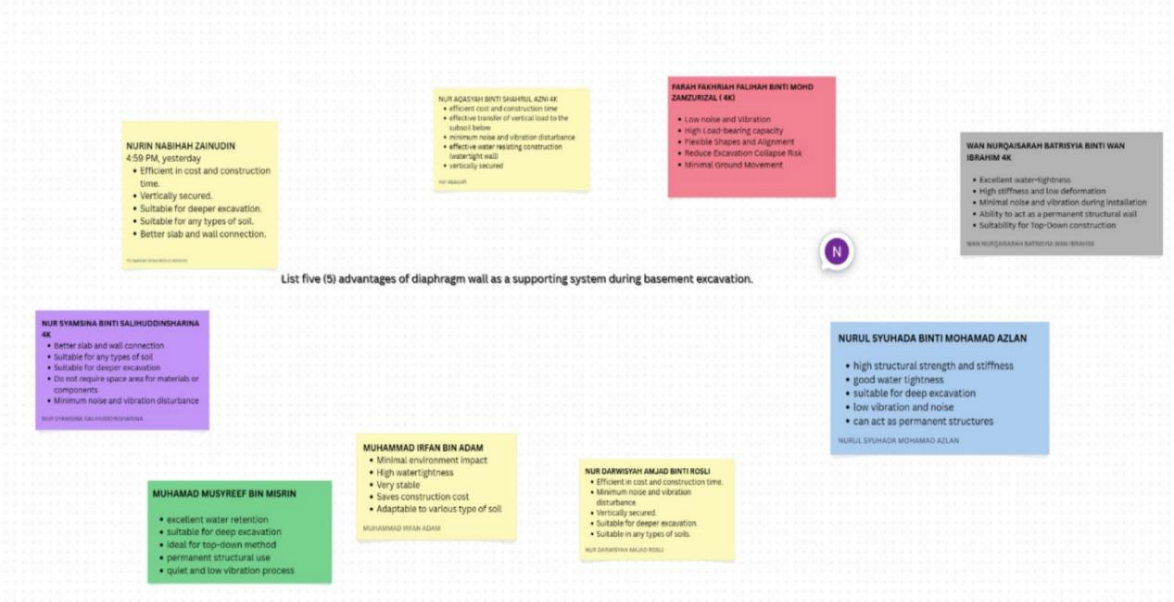


Figure 2 Overview of Cava Whiteboard Participated by Students

4. CONCLUSION

The study anticipates that merging AI-driven tools with collaborative digital environments will foster a more dynamic learning atmosphere, leading to heightened student participation and deeper engagement for the preparation of concurrent and ongoing revisions per topic for the final examination day. It is projected that this approach will improve students' grasp of exam-related material while boosting their intrinsic motivation and overall involvement during the revision process. By combining AI-supported instruction with collaborative platforms like Canva Whiteboard, educators can provide a contemporary and impactful framework for boosting student involvement. This strategy shifts conventional revision techniques, from week 1 until week 14, toward a design thinking framework, fostering interactive learning environments that are especially beneficial within technical disciplines.

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The author would like to thank the students in Semester 2026 who participated in this study and contributed valuable feedback. The author hopes that this Whiteboard Warrior will run in the upcoming semester and that the students will have positive comments and be well-prepared for their final examination.

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