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Exploring the Impact of Multi-Mode Presentations on Communication Skills Development in the Introduction to Engineering Course

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ABSTRACT

BACKGROUND & CONTEXT

The Introduction to Engineering (ITE) course, offered to first-year chemical engineering students at Universiti Teknologi Malaysia, aims to introduce engineering principles and ethics through structured learning, including Cooperative Problem-Based Learning (CPBL). This innovative approach involves solving real-world problems, in this case, Non-Communicable Diseases (NCD), progressing through three stages of increasing complexity. The CPBL model, incorporates diverse learning styles to enhance students' communication and problem-solving skills. For the first time, the course implemented multiple presentation modes: class presentations, a video presentation, a novel walking presentation, and an exhibition-style e-poster presentation, each designed to simulate different real-world scenarios engineers may encounter.

PURPOSE OR GOAL

This study aimed to evaluate the impact of diverse presentation modes on students' communication skills, confidence, and overall learning experience, identifying their effectiveness and areas for improvement.

APPROACH OR METHODOLOGY

A survey was administered to gather students' feedback on their experiences with each presentation style and the overall CPBL framework. The research sought to explore whether these varied approaches improved students' ability to articulate technical ideas in different settings; an essential skill for future engineers. Data collection involved analyzing students' responses to surveys and reflections, focusing on their perceptions of the presentation modes, their level of confidence, and the challenges they faced. The study also assessed how the structured progression of the CPBL stages facilitated skill development. Observations from instructors and feedback from peers were used to complement the analysis.

OUTCOMES

The findings indicated that students highly valued the variety of presentation experiences, with many appreciating the unique challenge of the walking presentation, a novel experience for all participants. While most students still preferred traditional class presentations, they acknowledged significant improvements in their communication skills and confidence. The walking presentation, though challenging, provided valuable lessons in concise and impactful

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communication, while the exhibition-style e-poster presentation allowed students to simulate professional engineering scenarios.

CONCLUSIONS

In conclusion, incorporating multi-mode presentations into the ITE course effectively enhanced students' communication skills, adaptability, and confidence. These experiences prepared students for the dynamic environments they will encounter as professional engineers. Moving forward, further refinements to the presentation modes will be implemented to address feedback and improve the learning experience. This study underscores the value of experiential and adaptive learning in engineering education, equipping students with both technical knowledge and the soft skills essential for serving the nation effectively as future engineers.

KEYWORDS

multi-mode presentation, communication skills, walking presentation, e-poster presentation, CPBL.

Introduction

Effective communication is a cornerstone of engineering practice, enabling professionals to articulate technical ideas, collaborate across disciplines, and address real-world challenges. As engineering curricula evolve to meet the demands of a rapidly changing world, equipping students with robust communication skills has become increasingly crucial. This need is particularly evident in foundational courses such as Introduction to Engineering (ITE), which aims to nurture both technical competence and professional skills among first-year students.

At Universiti Teknologi Malaysia (UTM), the ITE course for first-year chemical engineering students integrates Cooperative Problem-Based Learning (CPBL), a pedagogy designed to foster active learning, problem-solving, and communication. The CPBL model, emphasizes incremental learning through the resolution of real-world problems, including complex issues (Yusof et al., 2016) such as non-communicable diseases (NCD). While CPBL has proven effective in enhancing problem-solving abilities, there remains significant scope to explore its impact on communication skills development.

Recognizing this gap, the ITE course incorporated a multi-mode presentation framework, introducing students to diverse formats, including traditional class presentations, a video presentation, a novel walking presentation, and exhibition-style e-poster presentations. These formats were designed to simulate the variety of communication scenarios engineers encounter in professional practice. By exposing students to these diverse modes, the course sought to cultivate adaptability, confidence, and the ability to convey technical concepts effectively in varied contexts. This aligns with research emphasizing the importance of experiential learning strategies in developing essential soft skills for engineers (Matsumoto et al., 2021; Zapalska, 2021, Chan et al., 2019, Nguyen et al., 2021).

This study aimed to evaluate the effectiveness of multi-mode presentations in enhancing students' communication skills within the CPBL framework. Data were collected through student surveys, instructor observations, and peer feedback, focusing on students' perceptions of the presentation styles, their confidence levels in presenting, and the challenges they encountered. Special attention was given to the walking presentation, a novel format that required concise, impactful communication while moving, and the e-poster presentation, which mimicked professional engineering exhibitions.

The findings contribute to a growing body of literature on adaptive learning strategies in engineering education, particularly in the ASEAN region, where innovative pedagogies are gaining traction (Abdulwahed et al., 2017; Supriyadi et al., 2023). By examining the impact of these diverse presentation modes, this research underscores the potential of experiential and

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context-driven learning approaches to prepare students for the multifaceted demands of engineering practice.

Literature Review

In the context of rapid globalization, digitalization, and Industry 4.0, communication skills have emerged as a core professional competency for modern engineers. The employability of engineering graduates now extends beyond technical mastery to include abilities such as oral, written, visual, intercultural, and interdisciplinary communication skills essential for effective professional practice, career progression, and global collaboration (Nguyen, 2021; González-Pérez, 2022; Thornhill-Miller, 2023). Wu et al. (2023) affirm that in today's digital and remote work environments, communication is indispensable for engineering employability, with engineering programs urged to integrate comprehensive, authentic communication training. This aligns with frameworks like the Partnership for 21st Century Skills and Education 4.0 models, which prioritize communication alongside teamwork, leadership, and innovation in increasingly complex, technology-mediated workplaces (González-Pérez, 2022).

Historically, engineering curricula prioritized technical competencies, often neglecting communication skills. This gap became evident in the 1990s, as both industry leaders and educators began identifying deficiencies in graduates' communication abilities. Winsor et al. (1997) revealed widespread consensus on the need to strengthen teamwork and communication among engineering graduates, while Parvis (2001) emphasized public speaking and technical communication as indispensable for technical professionals. Theoretical foundations for integrating communication training are grounded in Kolb's (1984) Experiential Learning Theory, which advocates for learning through active participation, reflection, and iteration; a principle well suited for presentation-based tasks in engineering education.

By the early 2000s, accreditation bodies institutionalized communication training requirements. ABET's Engineering Criteria 2000 formally mandated graduates demonstrate "an ability to communicate effectively" (ABET, 2017), signalling a shift to outcomes-based education. International frameworks followed: JABEE (2015) and Malaysia's MQA (2017) both embedded communication within engineering program criteria. This led to the increased incorporation of communication-intensive, presentation-based assessments aligned with authentic, context-based learning strategies (Herrington and Oliver, 2000).

Numerous studies confirmed the persistent communication skills gap. The SPINE survey by Bodmer et al. (2002) involving 1,372 engineers in Europe and the U.S. identified communication, leadership, and teamwork as critical deficiencies. Similar findings emerged from Martin et al. (2005) and Male et al. (2010), while in Malaysia, Kassim and Ali (2010) noted that English oral communication remained underdeveloped despite strong technical preparation. These findings collectively underscored the need for curricula that provide consistent, practical opportunities for communication skills development.

In response, presentation-based assessments became common in engineering education, initially dominated by conventional slide presentations. However, educators soon recognized limitations with dense, text-heavy slides. Applying Cognitive Load Theory (Sweller, 1988), Mayer and Moreno (2003) advocated for simplified visuals and focused narration to reduce overload and improve clarity. This shift enhanced both visual design and oral communication clarity (Mackiewicz, 2008).

Seeking greater engagement and brevity, educators introduced alternatives like poster presentations in the late 2000s. Posters encouraged clarity, coherence, and interactive discussion, with Cianflone (2011) and El-Sakran et al. (2013) demonstrating that poster sessions improved technical explanation, confidence, and question-and-answer skills in multidisciplinary engineering teams. DeWitt and Alias (2017) further confirmed that poster-based tasks enhanced written, graphic, oral communication, and active listening through presentations and peer feedback.

By the 2010s, instructors adopted more active, participatory formats like the gallery walk, where students circulate around multiple displays, engaging in informal peer-to-peer communication. Tan and Perrault (2025) showed this approach promoted continuous peer engagement, audience adaptation, and reflection, aligning with experiential and constructivist learning principles.

Concurrently, time-constrained formats such as PechaKucha, with its strict 20 slides × 20 seconds structure, gained traction. Studies by Soto-Caban et al. (2011), Beyer (2011), and Klentzin et al. (2010) demonstrated PechaKucha's effectiveness in improving clarity, preparation, and audience engagement. These benefits aligned with cognitive load reduction principles, fostering succinct, structured storytelling (Anderson & Williams, 2012; Nguyen, 2015). Similarly, the Three Minute Thesis (3MT) format, originally for postgraduate research communication, was adapted into engineering education to train students in brevity, audience engagement, and accessible language. Fife (2021) and Kathpalia (2024) highlighted 3MT's effectiveness in cultivating concise, persuasive messaging aligned with modern workplace communication demands and ABET's graduate outcomes.

The proliferation of digital media and blended learning environments, particularly during the COVID-19 pandemic, accelerated the use of video presentations. Phan and Qi (2022) found video tasks enhanced students' preparation for live oral exams, while Clark and Andrews (2017) reported improvements in fluency, confidence, and asynchronous presentation skills and now a standard in engineering practice.

Reflecting on this trajectory, the evolution of presentation modes in engineering education mirrors shifting pedagogical and industry expectations. From foundational slide talks to posters, gallery walks, PechaKucha, 3MT, and video-based formats, each method addresses specific communication needs: clarity, conciseness, interactivity, or technological fluency. The literature strongly advocates for a multimodal, experiential approach to communication skills development in engineering curricula (Kolb, 1984; Herrington and Oliver, 2000).

At UTM, the SETK1523: Introduction to Engineering course exemplifies this progressive approach through a structured multimodal presentation framework. First-year chemical engineering students engage in varied formats, from traditional slide talks to walking presentations (informal, elevator pitch-style without presentation aids) and e-p oster sessions designed to simulate authentic, diverse engineering communication scenarios. Grounded in Kolb's experiential learning model and embedded within a CPBL framework (Yusof et al., 2013), the course emphasizes active participation, feedback, and teamwork to cultivate communication competence across oral, visual, and digital platforms. The program's alignment with ABET (2017) and MQA (2017) standards ensures its graduates develop communication skills relevant to contemporary, multicultural, and technology-rich workplaces. Recognized by UTM's Award of Excellence in Active Blended Learning (2020), SETK1523 represents a model for integrating multimodal, experiential communication training in engineering education.

However, despite growing interest in presentation-based pedagogies, few studies have systematically compared the distinct contributions of multiple presentation modes to specific communication competencies within a single program. Most research remain confined to individual formats without insights into skill development. This study addresses these gaps by exploring how a multimode presentation framework in SETK1523 supports the acquisition of diverse communication skills, offering practical implications for future engineering education design. Hence, the objective of this study is to explore the impact of multi-mode presentations on communication skills development in the ITE course.

Design and Implementation

The study was conducted within the framework of the ITE course, which adopts a CPBL model built around the project theme CheME4Health 2024. CheME4Health 2024 project is about an effort to proactively seek the students to address and reduce NCDs through sustainable, engineering-based solutions that target root causes before they escalate into serious public

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health burdens, conducted in the semester ITE is being taught to students (14 weeks). This course was designed to enhance students' communication and professional skills by engaging them in multidisciplinary team-based projects supported by a structured sequence of multi-mode presentation tasks. Each phase culminated in a distinct communication activity using a specific presentation mode to gradually scaffold students' communication skill development. The course was organized into an introduction to engineering overview and three major CPBL stages as tabulated in Table 1.

Table 1: Course structure showing where the 4 modes of presentation types were embedded

Phases Across Semester	Description of Phase	Presentation Type
Engineering Overview 5/10/2024 to 15/10/2024	Understanding what is engineering and its critical aspects.	Video
CPBL Stage 1 15/10/2024 to 12/11/2024	Familiarisation with sustainable development, NCD issues and local and international benchmarking	Walking Pitch
CPBL Stage 2 12/11/2024 to 17/12/2024	Audit of factors contributing to NCDs in relation to university students and Malaysian families, and development of a MATLAB program to identify a root cause of NCDs	Slides
CPBL Stage 3 17/12/2024 to 16/1/2025	Proposal of engineering solution to mitigate NCDs	Poster

The sequencing of presentation modes was carefully designed to align with the students' progress in problem-solving and project development. In the first phase, that is Engineering Overview, students are required to prepare an Engineering Overview Report by conducting a write up on what they understood about engineering, perform literature review and interviewing two practicing engineers to explore the definition, roles, and ethical aspects of engineering, as well as a specific assigned topic. The main task is to integrate insights from both sources into a well-structured, analytical report that demonstrates critical understanding and relevance.

Subsequently, students were introduced to the CPBL project and began exploring CPBL Stage 1 real-world problems under the CheME4Health 2024 umbrella, they prepared and delivered a walking pitch. This informal, mobile presentation was delivered in or outside classroom (depending on instructor's preference), and required students to explain their team's problem framing in under five minutes to the instructor while walking. This format emphasized verbal clarity, audience engagement, and peer feedback in a low-pressure environment. Once in a while, the instructor may pose unexpected questions, disrupting the flow of the students' presentation. This challenges students to stay alert, be well-prepared, and respond effectively to unforeseen situations during their walking pitch, while at the same time conveying the message they are supposed to do.

After refining their problem statements and conceptualizing solutions, in CPBL Stage 2, students developed a formal PowerPoint-based presentation. This mode allowed them to practice structured, technical communication with emphasis on logical flow, data integration, and visual support.

At the final stage (CPBL Stage 3), students presented their complete solutions using academic e-posters. This mode encouraged concise, high-impact visual communication and mimicked professional engineering conference settings. The posters were showcased in a classroom exhibition where students presented to peers and invited panels.

Student Support and Scaffolding

To ensure fair assessment and to effectively support student learning, several scaffolding strategies were implemented throughout the course. Each presentation mode was accompanied by a standardized rubric that clearly outlined expectations in terms of content clarity, communication effectiveness, visual design, and audience engagement. These rubrics were shared with students in advance to guide their preparation and to promote transparency in assessment. Prior to each presentation, respective instructors briefed on the specific mode they were preparing for. These sessions provided practical guidance on content structuring, delivery techniques, and effective visual communication. To build confidence and improve quality, students were encouraged to rehearse their presentations within their teams and to engage in peer feedback activities. After each presentation, students submitted reflection notes to foster self-awareness and metacognitive development regarding their communication skills.

Rationale for Sequencing

The presentation sequence was designed to move from individual expression (video) to informal team communication (walking pitch), then to formal structured delivery (slides), and finally to professional technical presentation (poster). This progression helped build confidence, foster collaboration, and support communication skill development in increasingly authentic and complex formats.

Data Collection and Analysis

This study utilized a mixed-method research design to investigate how multi-mode presentation activities contributed to the development of students' communication skills in the ITE course. Data were collected through reflective journals and a structured end-of-course survey.

A total of 317 student reflection journals were collected from three sections of the course, submitted at the end of each stage of the semester-long project. These reflections were guided using Gibbs' Reflective Cycle, allowing students to describe, analyze, and evaluate their learning experiences. Notably, students were not explicitly prompted to reflect on presentation activities to avoid bias and encourage authentic responses.

Thematic analysis followed Braun and Clarke's (2006) six-step approach, conducted inductively and mapped against Bandura's Social Learning Theory to explain learning behaviors through cognitive, behavioral, and environmental factors. Two researchers independently extracted and coded relevant excerpts from the journals. Initial codes were generated based on recurring elements such as content structuring, audience adaptation, self-efficacy, and environmental factors. These codes were grouped into broader themes reflecting the students' evolving communication skills. Themes were continuously refined to ensure alignment with both the data and theoretical framework, enhancing trustworthiness through inter-rater comparison.

To complement the qualitative findings, a structured survey was conducted to assess students' perceptions of each presentation mode, which are Online Video, Walking Pitch, Conventional Slides, and e-Poster. A total of 78 responses were collected across three course sections. The survey employed a 5-point Likert scale to assess five key aspects for each presentation mode: overall experience, confidence during delivery, ease of preparation, audience engagement, and ease of conveying key information.

Descriptive statistics were used to summarize response distributions. The data were analyzed to identify trends and variations in students' preferences and performance across the different modes. Additionally, open-ended questions were included to gather suggestions for improvement and to identify which mode students found most beneficial and enjoyable for developing their communication skills.

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The combination of reflection journals and survey data provided a comprehensive view of students' experiences, capturing both deep, self-reflective insights and quantifiable perceptions. This mixed-method approach enabled triangulation of data and strengthened the validity of the findings on the effectiveness of multi-mode presentations in enhancing communication competence.

Results and Discussion

The integration of multi-mode presentations in the ITE course significantly contributed to the development of students' communication skills. This section presents findings from two sources: (1) qualitative data from student reflection journals and quantitative data from an end-of-course survey; and (2) qualitative data from the survey given to participating students. Together, these findings offer insights into how each presentation format uniquely influenced students' communication competency, confidence, and adaptability.

Thematic analysis of 317 reflection journals revealed strong evidence of cognitive development. Table 2 summarizes representative student subcodes, grouped into emerging codes and corresponding themes. These findings illustrate students' growing ability to focus on core messages, adapt to audiences, and structure content effectively, supporting both content mastery and real-time communication adaptability. Students often explained how they learned to focus on "key points," "clearly structure the presentation," and "use examples instead of facts," demonstrating their growing ability to distill complex content into clear, audience-appropriate messages. The walking pitch, in particular, challenged students to internalize their material due to the absence of visual aids, as reflected in journal entries that mentioned needing to "really understand the data" and "think more critically about what information was most important."

Table 2: Thematic coding of students' reflection journals on communication skills across presentation modes

Sample of Subcodes	Codes	Themes
central idea and anchor our discussion	Central idea	Delivery of knowledge is the aim in effective presentation (Cognitive)
to remember what point I going to say	Content expert	
focus on the key points that easier to understand	Key points	
connect the content with practical outcomes to create an impactful video.	Sample of example	
using examples instead of facts, intonation and using simple words.		
force me to think more critically about what information was most important and how to express it succinctly.	Selecting content critical aspect of content	
focus on the most critical aspects of a project.		
more than just delivering prepared content; they require adaptability and a deep understanding of the material.	Understanding of material	
main topic, cover the key points, and conclude with a clear takeaway, all within a few minutes.	Structure of presentation	
audience keep nodding their head which shows that they can understand about our presentation well	Audience response	Expectation of the presentation outcome

adapt my message based on the audience and context.	Message to audience	matches the audience's acceptance or needs (Behaviour)
mental picture for my audience.	Mental picture	
more audience-centered mindset, teaching me how to tailor my message to meet the needs of the listener.	Audience-centered mindset	
Distilling complex information into a short, clear presentation is crucial, especially when working with stakeholders or non-technical audiences.	Audience needs adaptation	
ensure that each part of the presentation contributes to the overall message.	Overall message	
responses to potential questions.	Potential questions	
practiced this presentation on the previous day.	Practice	Self-efficacy in skill development in presentation (belief and attitude towards behavior change)
Prepare slide summary before record a video presentation	Preparation	
used appropriate tones and body language to grab our audience's attention	Body language	
presenting clearly and effectively while walking	Voice projection	Skills that need to be developed to enhance presentation outcomes (Behavior)
smooth transitions while switching presenters between points.	Transitions/team coordination	
keeping eye contact with the audience	Eye contact	
feedback on each presentation	Constructive feedback	
without using any digital tools; (pitching style)	Unsupported media	
handling technical tools (online conference/video editor)	Technology use	
explain our findings in a short amount of time	Time constraint	Environmental factors are a medium for the learning process
simulate a scenario where we were presenting our findings to a professor; requires a volunteer as a CEO to listen to our presentation while walking.	Stakeholder simulation	
feel like just talking to friends; more relaxing than formal presentation (pitching style)	Presentation setting	
The presentation was not too satisfying for me, because we did not prepare some data to show for the audience so that everyone also understands what we present about	Supporting materials	

Survey data supported these findings, as shown in Table 3. For example, over 85.9% of students rated the conventional slides and e-Poster formats as effective in helping them convey key information (rated 4 or 5), while 79.5% said the online video presentation also facilitated clear delivery. The walking pitch, though lower at 52.5%, still demonstrated value, especially considering the format's inherent challenge of delivering while moving without slides.

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Table 3: Student Ratings for Each Presentation Mode

Presentation Mode	Overall Experience (%)	Confidence (%)	Audience Engagement (%)	Ease of Conveying Information (%)
Online Video	87.2%	88.5%	73.0%	79.5%
Walking Pitch	78.2%	67.9%	70.5%	52.5%
Conventional Slides	88.5%	86.0%	80.7%	85.9%
e-Poster	88.5%	84.6%	85.9%	79.4%

These results align with the cognitive component of Bandura's Social Learning Theory and Kolb's experiential learning cycle, where active engagement leads to deeper learning and improved conceptual clarity. Across the reflection journals, students frequently mentioned how they began to tailor their messages based on audience expectations. Phrases such as "create a mental picture for the audience," "adjust tone and language," and "present like we're talking to a CEO in a hurry" indicate growing behavioral awareness and adaptability. The walking pitch was frequently cited as a key driver of this growth, pushing students to simplify, engage spontaneously, and speak with purpose. Survey responses reinforced these observations. 70.5% of students rated the walking pitch as engaging for the audience, while 85.9% of students rated the e-Poster presentation as highly engaging. These results suggest students were not only mindful of content but also of how it was received by different audiences, simulating real-world engineering communication scenarios such as stakeholder briefings, poster exhibitions, and informal pitching.

This shift aligns with the behavioral dimension of Bandura's theory, demonstrating how students adjust their actions based on observed effectiveness and situational demands. Students' journal entries reflected a steady increase in confidence, with many citing that "rehearsals helped calm my nervousness," or that "preparing summary slides before video recording made me more confident." The increase in confidence among students was particularly evident during discussions about new presentation formats, such as walking pitches and videos. Although these formats initially caused some anxiety, they ultimately improved the students' delivery skills. Survey results confirmed this trend, where 88.5% of students felt confident presenting their online videos, 84.6% felt confident during the e-poster presentations, and 86% felt confident using conventional slides. While walking pitch had lower confidence (67.9%), it was still seen as the most beneficial presentation mode for communication skill development by 41% of respondents in open-ended responses. As shown in Figure 1, walking pitch was perceived as the most beneficial for communication skill development but also reported as the least enjoyable (28 mentions), illustrating the dual role of challenge and growth.

Qualitative data from student reflection journals indicate that self-efficacy improved as students engaged with diverse and progressively challenging formats. These findings reinforce the value of offering a balanced range of presentation experiences, as such variety contributes to mastery-based self-efficacy development, which is an essential element of communication skill building (Marshall-Wheeler, Meng, & Worker, 2022). Various environmental factors, such as time constraints, available resources, and physical movement, also had an impact on the students' learning experiences. For instance, in the walking pitch exercise, students noted challenges such as "managing their pace," "the lack of visuals," and "distractions from the venue." In contrast, during video presentations, they appreciated the "freedom to edit" and felt "less pressure due to pre-recording."

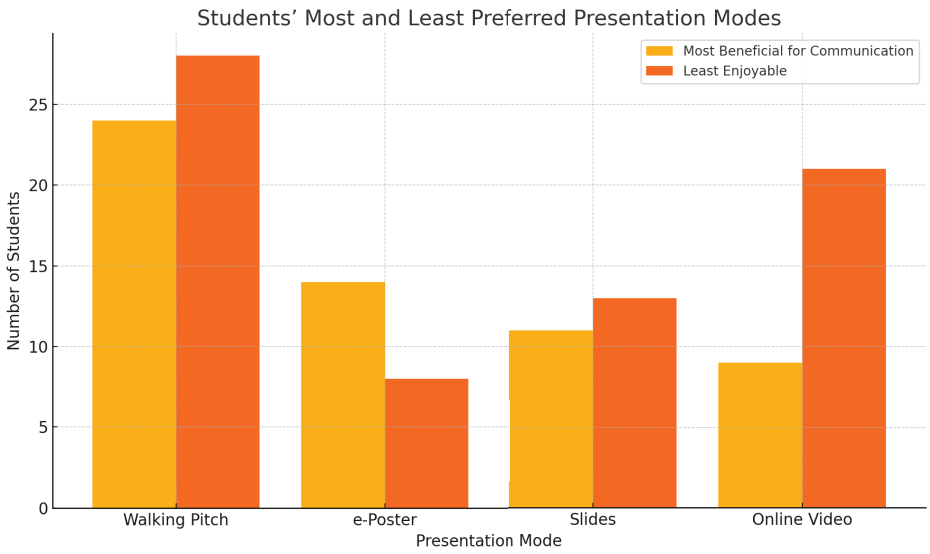


Figure 1: Students' most beneficial and least enjoyable presentation modes

The survey also highlights that conventional slides and e-poster presentations were the most well-received, with high ratings across all criteria, particularly in overall experience, audience engagement, and clarity of information, supporting earlier findings that poster-based formats can enhance learner interaction and reduce speaker anxiety (Prichard & Ferreira, 2014). Online video presentations also received a strong overall rating (87.2%), likely due to the flexibility and lower pressure of pre-recording, which is known to reduce performance anxiety among learners (Madzlan, Seng, & Kesevan, 2020). In contrast, the walking pitch format received a comparatively lower score (78.2%), reflecting the greater challenge it posed—yet its inclusion remains valuable for exposing students to real-life, spontaneous communication contexts. These findings reinforce the value of offering a balanced range of presentation experiences, combining comfort with challenge to holistically develop students' communication skills.

These collective insights from student reflections and survey data demonstrate that each presentation mode offered distinct contributions to communication skill development. While structured formats enhanced clarity and confidence, more challenging modes fostered spontaneity, critical thinking, and adaptability. The integration of multiple presentation types not only diversified the learning experience but is also aligned with the intended outcomes of the CPBL framework, preparing students for the varied and dynamic communication demands of real-world engineering practice.

Conclusions

This study demonstrated that the integration of multi-mode presentations within the ITE course significantly enhanced students' communication skills, adaptability, and confidence. By engaging with varied presentation formats ranging from video and walking pitch to slide-based and e-poster presentations, students were exposed to a spectrum of real-world communication scenarios that required both technical clarity and audience awareness. The combination of reflective journals and survey data revealed that each presentation mode contributed uniquely to communication skill development. Structured modes such as slide and poster presentations improved students' clarity, confidence, and visual communication, while more challenging formats like the walking pitch fostered spontaneity, critical thinking, and verbal articulation without reliance on visual aids. The carefully sequenced presentation tasks, embedded within the CPBL framework, supported progressive learning and promoted deeper engagement with content and context. Overall, the study highlights the value of experiential, multimodal strategies in engineering education, reinforcing their role in preparing students for the diverse

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and dynamic communication demands of professional engineering practice. Future iterations of the course will continue to refine these modes based on student feedback, ensuring a balanced, inclusive, and impactful learning experience.

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