

Enhancing English Proficiency through Level-Based Flipped Learning: Insights from a First-Time Implementation in a Computing Faculty

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Abstract

This study reports on the first implementation of a flipped English module at the Faculty of Computing, Sri Lanka Institute of Information Technology (SLIIT), designed to improve students' speaking proficiency through a custom mobile application integrated with AI-driven tasks. The flipped approach encouraged learners to engage with video lessons, quizzes, and practice activities before class, while classroom sessions were reserved for interactive assessments and communicative practice. Data were collected from 266 first-year undergraduates using a structured online survey consisting of Likert-scale items and open-ended questions. Quantitative data were analyzed using descriptive statistics, and qualitative responses were thematically coded to capture student perspectives in depth. The findings demonstrate high levels of engagement, particularly with quizzes and instructional videos, which students described as helpful in consolidating knowledge and preparing for class. Many participants reported improvements in pronunciation, confidence, and overall communication skills, indicating that the flipped model effectively supported oral language development. In-class sessions were also viewed positively, with students valuing the opportunities for practice and feedback, and recognizing the strong alignment between app-based tasks and classroom activities. Nonetheless, several challenges were identified, including technical glitches, loss of progress due to the lack of an autosave function, heavy workloads, and the need for more interactive speaking opportunities. These results highlight both the strengths and limitations of flipped CALL approaches in STEM-based higher education. Overall, the study suggests that integrating flipped learning with AI-driven tools can significantly enhance English proficiency, provided that issues of workload, app design, and feedback practices are carefully addressed.

Keywords: *Flipped approach, Speaking skills, ESL, Custom app*

Introduction

The globalization of higher education has made English proficiency crucial, especially in countries where it is not the dominant language but serves as the medium of instruction in STEM disciplines. In Sri Lanka, English proficiency strongly influences academic success and employability (Wijesinghe & Gunawardena, 2021). Yet, large student cohorts, limited instructional time, and varied proficiency levels often reduce the effectiveness of traditional teaching. Flipped learning offers a promising

alternative by shifting content delivery outside class and reserving classroom time for active, higher-order learning (Bergmann & Sams, 2014). In English language education, flipped models have proven effective for building communicative competence, as they allow more time for interaction and practice in class (Vygotsky, 1978; Teng, 2021). The integration of artificial intelligence (AI) in Computer-Assisted Language Learning (CALL) further enhances this model, particularly through AI-based speaking tasks that provide immediate feedback and extended oral practice opportunities (Zou et al., 2023).

Although flipped learning has been increasingly applied in higher education, little is known about its effectiveness when tailored to proficiency levels in English language modules within computing faculties in Sri Lanka. Existing studies largely focus on general EAP contexts, leaving a gap in understanding how a level-based flipped model may support undergraduates in technical disciplines where English is often a secondary concern.

The methodological design of the flipped classroom was underpinned by constructivist and sociocultural learning theories, which emphasize scaffolding, interaction, and learner autonomy (Vygotsky, 1978; Piaget, 1970). Drawing on Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001), pre-class activities targeted lower-order cognitive skills, while in-class sessions were designed to promote higher-order application and analysis. In terms of second language acquisition, Krashen's Input Hypothesis (1985) informed the provision of comprehensible input through pre-class materials, while Swain's Output Hypothesis (1995) shaped the design of in-class speaking and writing activities. This theoretical grounding provided the rationale for adopting a level-based flipped model, ensuring that both weaker and stronger learners benefited from differentiated input and interactive practice.

This study reports on the first implementation of a flipped English module at the Faculty of Computing, SLIIT, designed to strengthen first-year students' speaking proficiency. The objective of this study was to examine how a level-based flipped English module could enhance student engagement, participation, and perceptions of learning in a computing faculty. Specifically, the study aimed to evaluate the integration of app-based lessons and AI-driven tasks as tools to support speaking proficiency. Using a custom mobile app for pre-class lessons and AI-driven tasks, the course maximized class time for interactive assessments and communication. The study addresses three research questions:

- (a) How did students engage with the app-based course?
- (b) How did they participate in in-class sessions?
- (c) What were their perceptions of the flipped model?

Methodology

This study used a survey-based descriptive design to examine student engagement and perceptions of a flipped, app-supported English course. The aim was not to test hypotheses but to document students' experiences during its first implementation (Cohen, Manion, & Morrison, 2018). Participants included 266 first-year computing undergraduates out of a total enrolment of about 1,200, representing roughly 22% of the cohort. Although not exhaustive, this response rate was sufficient to capture key patterns and insights (Fowler, 2014). Data was collected through a structured online questionnaire containing Likert-scale items on engagement, usefulness, and challenges, as well as open-ended questions that allowed students to provide qualitative reflections beyond numerical trends.

Quantitative survey items were examined using descriptive statistics (frequencies, percentages, and averages) to identify participation patterns and general attitudes. Qualitative responses were analyzed thematically, with comments coded under recurring themes such as benefits, challenges, and suggestions. This mixed approach provided both broad trends and deeper insights, consistent with Patton's (2015) view that numbers alone cannot capture the complexity of human experience.

The study followed standard ethical practices in the collection and handling of data. Participation in the survey was entirely voluntary, and students were informed of the purpose of the study prior to completing the questionnaire. No email addresses or personally identifying information were collected, ensuring the anonymity of all responses. The survey was circulated online, and students were free to withdraw by simply choosing not to respond. The data was used solely for research purposes and reported in aggregate form, thereby safeguarding confidentiality and protecting participants' privacy.

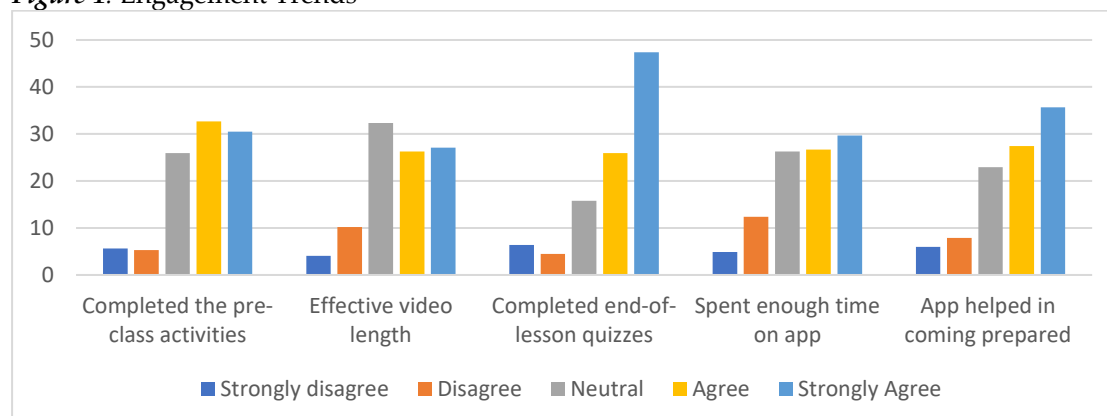
Results

This section reports findings from the student survey on the flipped English module. Quantitative results from Likert-scale items (Sections A–E) are presented using descriptive statistics and charts to show patterns in engagement, speaking improvement, in-class practices, and app usability. Qualitative responses (Section F) are analyzed thematically to capture students' views on strengths, challenges, and suggestions for improvement.

The survey included 266 first-year undergraduates: 59 from Group A (high proficiency), 75 from Group B, 59 from Group C, and 73 from Group D (low proficiency). Almost all participants (265/266) used the app, indicating strong engagement potential for the flipped learning model. The balanced representation across proficiency levels allows analysis of how different learners interacted with app-based preparation and in-class activities.

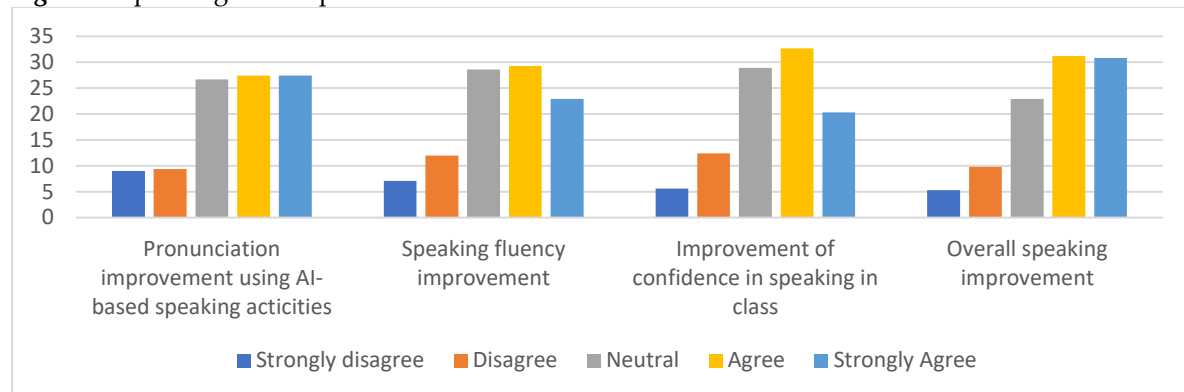
Most students reported regular pre-class lesson completion, with 168 agreeing or strongly agreeing. Video length was generally acceptable, and end-of-lesson quizzes had the highest engagement, with 126 strongly agreeing that they completed them. Students indicated spending sufficient time on the app and felt it helped them come prepared. Neutral and disagree responses suggest variability in engagement, emphasizing the importance of guidance and motivation strategies to ensure consistent participation.

Figure 1: Engagement Trends



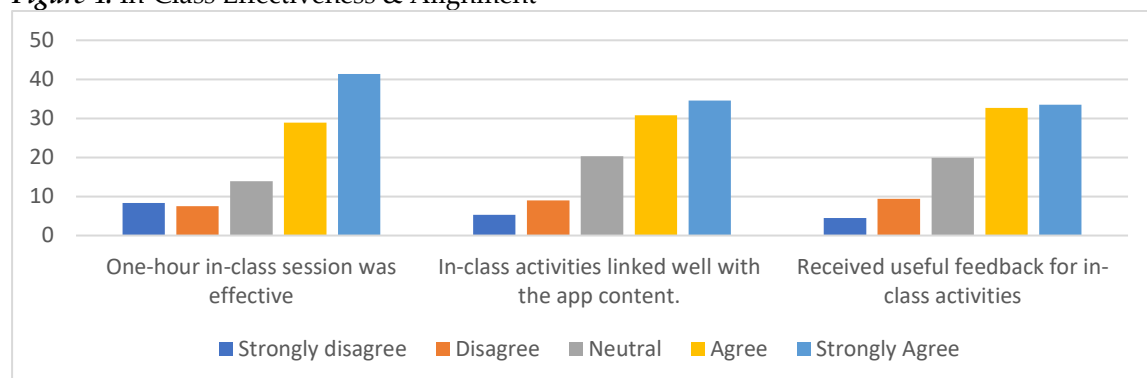
Responses indicate moderate to strong perceived gains in pronunciation, fluency, and confidence. While 73 students strongly agreed that AI-based activities improved pronunciation, neutral responses were substantial, highlighting that some learners may need additional scaffolding or personalized feedback. Overall, 165–170 students agreed or strongly agreed that speaking skills improved during the module, demonstrating that the app contributed to measurable development in oral proficiency.

Figure 3: Speaking Development Outcomes



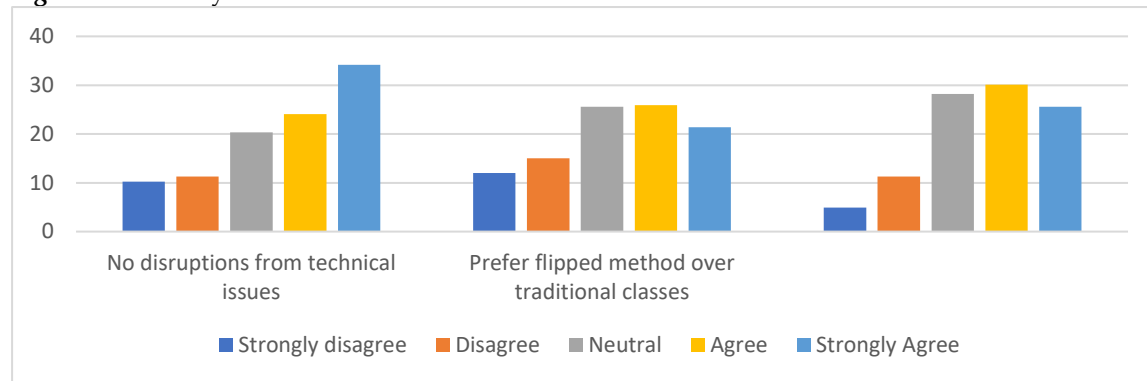
Students generally viewed the one-hour face-to-face sessions as effective, with 70% agreeing or strongly agreeing. Classroom activities were largely aligned with app content (65% agreement), and feedback was valued by 66% of students. Neutral and disagree responses highlight variability in engagement or clarity of activity alignment. The findings suggest that while the flipped approach effectively translated to classroom practice for most learners, refinement may enhance consistency and maximize learning for all proficiency levels.

Figure 4: In-Class Effectiveness & Alignment



The app was largely perceived as user-friendly (58% agreement), though 21% reported difficulties, indicating room for improved interface design and technical support. Technical issues moderately affected learning for nearly one-third of students, emphasizing the need for reliable infrastructure. More than half of the cohort preferred the flipped model over traditional classes, yet a notable neutral group suggests adjustment challenges. Overall, usability was a strength, but technical and workload considerations remain critical to sustained engagement.

Figure 5: Usability & Workload Trends



Students highlighted quizzes, video lessons, and AI-based speaking activities as the most helpful features of the flipped model. One student noted, *“The quizzes were very useful; they helped me understand what to focus on in class,”* while another commented, *“Talking with the AI assistant improved my pronunciation and boosted my confidence.”* Ease of access and structured progression were also appreciated. Technical issues, such as progress resetting (*“Sometimes the app resets my progress, which is frustrating”*), and workload concerns were common suggestions for improvement. Overall, students valued interactive learning but recommended smoother functionality and lighter tasks.

Discussion

The results indicate that the level-based flipped learning approach was largely effective in enhancing English proficiency among first-year computing students. High engagement with pre-class lessons, quizzes, and video content suggests that students valued structured, interactive learning outside the classroom. AI-mediated speaking activities contributed to improved pronunciation, fluency, and confidence, although some learners remained neutral, highlighting differences in individual readiness and experience.

In-class sessions were generally well-received, with most students noting effective use of time, alignment with app-based preparation, and useful feedback. Yet, a minority reported inconsistent experiences, suggesting that more personalized guidance and active participation strategies could further enhance outcomes. While the app was mostly user-friendly, technical glitches and navigation issues were noted, affecting a subset of learners. Despite this, a majority preferred the flipped model over traditional classes, appreciating its flexibility and active learning focus.

Open-ended feedback reinforced these findings, with students emphasizing the value of quizzes, structured content, and AI speaking practice, while recommending improvements in technical reliability, workload, and expanded speaking opportunities. Overall, the study confirms that well-integrated pre-class preparation and interactive classroom components support language development, though attention to technical and pedagogical support is essential for consistent learner benefit.

Conclusion

This study demonstrates that level-based flipped learning can effectively enhance English proficiency among first-year computing students. High engagement with app-based lessons, quizzes, and AI speaking activities, coupled with structured in-class practice and feedback, contributed to improvements in speaking skills, confidence, and overall classroom readiness. While most students favoured the flipped model, technical issues, navigation challenges, and workload concerns highlight areas for refinement. Overall, the findings suggest that a well-integrated flipped approach—combining

interactive pre-class preparation with active, feedback-rich classroom sessions—supports both autonomous learning and practical language development.

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