Empowering EFL Learners through AI—

Opportunities, Challenges, and the Human Element

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Abstract

Education at all levels has undergone radical changes in recent years, largely due to the rise of artificial intelligence (AI). Within Taiwanese colleges, collectivism and conformity often outweigh individuality and diversity. The information overload of the AI era, coupled with a cultural tendency toward conformity, has further complicated efforts to enhance English as a foreign language (EFL) students’ critical thinking and speaking proficiency. This nine-month mixed-methods study involved 40 first-year university students in Taiwan. Data were collected through surveys, reflections, teacher and TA observations, and speaking tasks. Qualitative data were analyzed using theme-based content analysis; speaking performance was evaluated with descriptive statistics. Preliminary findings reveal three trends. First, given time, students expressed their ideas more confidently, but struggled to critically analyze complex issues from diverse perspectives. Second, AI-generated critical-thinking questions provided an effective "learning path" for students, promoting a shared learning experience where individual voices were acknowledged. Third, technology-supported platforms optimized class time through non-linear sharing, efficient content delivery, and collaborative group work. AI advancements offer EFL teaching and learning a wide array of opportunities. With clear guidance, authentic materials addressing social and global issues, and AI-generated critical-thinking prompts, first-year university students’ speaking proficiency can be meaningfully strengthened. These benefits are most evident when learners have sufficient time to discuss, reflect, and articulate ideas. AI can quickly adapt content to match learners' levels and interests. However, effective implementation requires ongoing instructor guidance to ensure that the fundamental human elements—reasoning, reflection, and discussion—remain central to the learning process.

***Keywords*:** AI in education, EFL instruction, critical thinking, speaking proficiency, educational technology

1. Introduction

The educational landscape has undergone significant changes since the outbreak of the COVID-19 pandemic, during which time online teaching and learning became the norm. This transition was soon followed by the rapid proliferation of Artificial Intelligence (AI) tools, particularly after the release of ChatGPT in November 2022. As technology continues to evolve at an unprecedented speed, the integration of AI in education presents a dichotomy: while it can be a powerful tool to augment learning, its improper application threatens to undermine students' creativity and critical thinking. Consequently, higher education faces a pressing need to guide students in the effective use of AI to facilitate the acquisition of professional knowledge and key 21st-century skills, such as digital literacies, critical thinking, collaboration, and communication. However, a significant gap exists between this need and current practice. For instance, despite the importance of these skills, a study by Varas et al. (2023) across 20 Latin American countries found that they are often not incorporated into teaching. The study further notes a lack of common understanding and strategies for developing these essential competencies.

Critical thinking and effective communication are essential skills in higher education, yet they present persistent challenges for many Taiwanese university students. Rooted in an educational background that has not prioritized critical thinking and a culture that often implicitly encourages conformity, students often struggle to voice their opinions or share their ideas. According to Aston (2024), the common difficulty students have with critical thinking, though usually considered as an integral part of higher education, stems from the fact that it is not an innate ability, but a set of skills – including analysis, perspective-taking, and argumentation – that must be explicitly developed.

The emergence of powerful Artificial Intelligence (AI) offers a new opportunity to address pedagogical gaps in communication and critical thinking. In response, this study implements a partnership-driven co-creation model with an issue-based course design that strategically uses AI-generated critical-thinking questions on social and global issues to stimulate classroom discussion. The primary objectives are to enhance the speaking proficiency of first-year Taiwanese EFL university students and to foster the co-construction of critical thinking in a collaborative learning environment. To assess how this approach empowers students in speaking and critical thinking, the study is guided by the following research questions:

**RQ1:** To what extent does issue-based course design enhance the speaking proficiency of first-year Taiwanese EFL university students?

**RQ2:** In what way is critical thinking co-constructed by the students and an instructor within an instructional context that incorporates AI-generated questions on social or global issues?

2. Literature Review

This section reviews the literature across three key areas that inform the current study: the human-AI partnership, the issue-based approach in pedagogy, and the principles of collaboration and co-creation in education.

2.1. The Human-AI Partnership

Artificial intelligence (AI) has permeated nearly every aspect of daily life and continues to have an exponential impact on society. The ubiquity of these tools requires a new focus on human-AI collaboration. Clark (2025) posits that to navigate this new reality, adjusting to collaborations with AI and maintaining flexible thinking allows us to properly assess the benefits and threats of AI. In his work *Extending Minds with Generative AI*, Clark (2025) suggests how generative AI can enlighten or inspire human thought, but also cautions that an overreliance on AI can hinder our ability to generate creative alternatives.

Similar to Clark’s human-AI collaborations, Sanders and Wood (2024) define “humachine” as “the optimal human-machine partnership,” illustrating the complementary collaboration of humans and machines. In other words, machine strengths compensate for human weaknesses, and vice versa. In the context of enterprise, “botsourcing” which indicates the emergence of a robotic workforce in place of human labor may be inevitable, yet human traits such as such as creativity, emotional intelligence, ethical conviction, and intuition remain irreplaceable (Sanders & Wood, 2024). In an educational context, the growing collaboration between humans and AI urgently calls for the development of new literacies. Clark (2025) urges educators to teach students how to critically evaluate AI-generated information through a cycle of "trusting and questioning." Similarly, Ou et al. (2024) advocate for the adoption of proper pedagogical methods to guide students toward the optimal use of AI tools.

***2.2. The Issue-based Approach***

The pedagogical literature uses some similar terms, such as "issue-based teaching" (Lin et al., 2024; Zangori et al., 2018) and "issue-based learning" (Ke et al., 2020). For consistency, this study adopts the term "issue-based approach," as used by Curtis et al. (2013). This approach uses a potentially complex and controversial issue as a learning opportunity, allowing students to understand its intricacies, and has gained popularity in science education (Lin et al., 2024). Despite its potential, its adoption faces several practical challenges. Hancock et al. (2019) identify several barriers for teachers, including insufficient planning time, limited classroom hours, little administrative support, and discomfort with engaging in controversial topics. Furthermore, a lack of tools required for instruction has been reported by teachers as one of the major difficulties in implementing the approach fully (Ke et al., 2020).

***2.3. Collaboration and Co-creation in Education***

Collaboration in education is not novel, and it remains significant in the 21st century. Listed among the 21st century skills and being one of the “Four Cs” (Communication, Collaboration, Critical Thinking, and Creativity), collaboration has been emphasized by influential psychologists and educators. The theoretical underpinnings of collaborative learning can be traced back decades. For instance, Lev Vygotsky’s Sociocultural Theory underscores the significance of social interaction in cognitive development, and his concept of the Zone of Proximal Development (ZPD) suggests that a learner, through collaboration, can achieve a higher level of understanding than they could alone (Vygotsky, 1978). In the same fashion, American educator and psychologist John Dewey advocates student-centered, experiential, and collaborative learning environments that foster critical thinking and real-world application skills (Trimbur, 1989).

In modern pedagogy, these principles are embodied in the concept of co-creation. According to Doyle et al. (2021), co-creation embraces the constructivist paradigm, with the teacher and students co-creating the learning environment and sharing the responsibility of achieving learning goals. This partnership can extend to setting goals and deciding on learning content and class activities. Bovill et al. (2016) frame this practice as a form of democratic education, highlighting the collaborative teacher-student and student-student relationships at its core.

3. Methodology

This 9-month study employed a mixed-method approach to examine the English speaking proficiency of college freshmen and how AI-generated questions foster students’ critical thinking through a diverse range of social and global issues.

***3.1. Context***

This study involved 40 intermediate-level Freshman English students (35 male, 5 female) from the College of Engineering at a university in northern Taiwan. Placement was based on college entrance exam scores. The course met for three hours over two days weekly, supplemented by a mandatory one-hour weekly TA session. An issue-based curriculum was implemented, using authentic materials on social and global topics (e.g., animal testing, politics, cell phone addiction, wars) to foster critical thinking. To promote engagement, students were invited to co-create the curriculum by suggesting topics and materials of interest.

To answer the research questions, a mixed-methods approach was used. For RQ1, which examined the impact of an issue-based curriculum on speaking proficiency, data were drawn from speaking proficiency tests and course assignments, supplemented by class activities and field notes. For RQ2, which investigated the co-construction of critical thinking using AI-generated questions, data were sourced from field notes, semi-structured interviews, and course assignments.

***3.2. Data Collection and Data Analysis***

To ensure a comprehensive understanding and to triangulate findings, this study utilized multiple data sources: student assignments, the BESTEP[[1]](#footnote-1) language proficiency test, semi-structured interviews designed in accordance with recommendations by Bearman (2019), and field notes from the teaching/research team (the instructor, teaching assistants, and research assistants). Additionally, digital artifacts from the course platform and applications like Canva and Padlet provided supplementary evidence of patterns and discrepancies. Furthermore, regular meetings between the instructor, teaching assistants, and research assistants throughout the nine-month study further enriched data analysis and reinforced reliability.

At the conclusion of the course, all enrolled students were invited to participate in a semi-structured interview. A total of 12 students (9 male, 3 female) volunteered for semi-structured interviews. The analytical process involved multiple readings of the interview transcripts to gain familiarity with the data, followed by the identification of recurring themes and the development of corresponding categories. The frequencies of these themes were then tabulated to identify trends. Categories were revised as needed to ensure accurate data representation. To prepare the data for content analysis, teaching assistants graded student assignments, and the research team transcribed all relevant audio and video recordings. To protect participant confidentiality, their identities were meticulously anonymized through the assignment of unique alphanumeric codes (e.g., "S7" for a student and "TR3" for a member of the teaching/research team).

***3.3. Issue-based and Student-centered Class Activities***

The course curriculum was delivered through a learner-centered, issue-based framework designed to foster critical thinking, as advocated by Aston (2024). Class sessions integrated textbook content with supplementary materials, including articles, audio, and videos that explored a wide range of relevant real-world issues. To encourage active learning and collaboration, activities such as discussions, debates, and educational games were frequently used. The instructor cultivated an environment that valued independent thinking by employing open-ended questions and explicitly reminding students that there were no fixed or “right” answers.

Students were active participants in shaping this curriculum. They were invited to propose contemporary, open-ended, and sometimes controversial topics for discussion. To facilitate these conversations, discussion questions were co-constructed through human-AI collaboration. AI-generated questions were tailored to align with each topic and the proficiency level of the students, and then revised by the instructor as necessary. This integration of thought-provoking, human-AI co-constructed questions helped lay the foundation for subsequent group and whole-class discussions. Weekly one-hour TA sessions were also specifically designed to develop students' productive skills, namely speaking and writing, through a variety of individual and group tasks.

To promote student engagement and co-creation in a large class of 40, digital tools like Canva Whiteboard and Padlet were regularly integrated into classroom activities. The online whiteboard functioned as a central space for displaying media, sharing resources, brainstorming, mind mapping, and collaborative idea exchange. This offered a valuable alternative to speaking, allowing all students to actively co-create content with the instructor and peers. By contributing images, text, reflections, and questions non-linearly within the same digital space, it effectively encouraged collaboration and maximized class time.

**4. Results**

This section presents findings on two main themes: first, the enhancement of students' speaking proficiency, and second, the co-construction of critical thinking via AI-generated questions. The analysis for each theme is supported by evidence from multiple data sources.

***4.1. Speaking Proficiency***

*4.1.1. Speaking proficiency test results*

To address RQ1, speaking proficiency data from the BESTEP test were analyzed for 30 freshman students. Freshmen could take the test twice during the 9 months. Data were excluded for students who missed the Fall 2024 test (n = 7) or withdrew from the study (n = 3). The results (Table 1) indicate a basic to lower-intermediate proficiency for most students (93.3%), with their scores concentrated in the A2+ to B1+ range. A smaller cohort of 20% (n = 6) achieved the B1+ level.

**Table 1**

*Results of the speaking proficiency test in Fall 2024*

|  |  |  |
| --- | --- | --- |
| **BESTEP** (speaking skill) **Level** (points)[[2]](#footnote-2) | **Number of students** | **Percentage**  **(%)** |
| **B2** (280 – 305 points) | 0 | 0% |
| **B1+** (260 – 275 points) | 6 | 20% |
| **B1** (230 – 255 points) | 10 | 33.3% |
| **A2+** (180 – 225 points) | 12 | 40% |
| **A2** (150 – 175 points) | 2 | 6.7% |
| **Total** | **30** | **100%** |

A comparison of productive and receptive skills revealed a significant gap. While over half the students achieved a B2 level or higher in listening (51.7%) and reading (55.2%), their productive skills lagged significantly, with only 9.7% reaching B2 in writing and none in speaking. Speaking was the most challenging skill, with students split between the B1/B1+ (53.3%) and A2/A2+ (46.7%) levels.

When a subset of 15 students retook the speaking test in Spring 2025, 60% (n = 9) improved their scores, while 40% (n = 6) performed worse. For those who improved, the average score increased by 28 points, with some students advancing by one or two proficiency levels, while others remained at the same level in spite of score gains. In contrast, those whose scores declined saw an average decrease of 14 points, though none dropped to a lower proficiency level. A detailed comparison is presented in Table 2.

**Table 2**

*A Comparison of Test Results of The Speaking Proficiency Test (Fall 2024 and Spring 2025)*

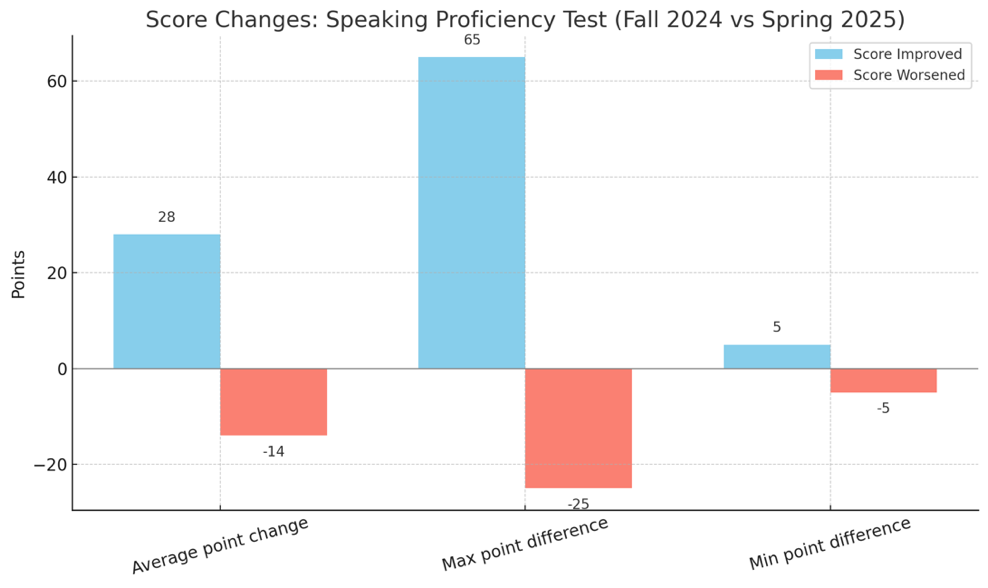
|  |  |  |
| --- | --- | --- |
| **BESTEP** (speaking skill) | **Score improved**  **(n = 9 students)** | **Score worsened**  **(n = 6 students)** |
| Average points increased/decreased | 28 points | -14 points |
| Maximal point difference within a student | 65 points | -25 points |
| Minimal point difference within a student | 5 points | -5 points |
| Number of students whose proficiency level  moved up 2 levels | 2 students | N/A |
| Number of students whose proficiency level  proficiency level moved up 1 level | 3 students | N/A |
| Number of students whose proficiency level  proficiency level remains the same | 4 students | 6 students |
| Number of students whose proficiency level  proficiency level moved down 1 level | N/A | 0 |

Note: The change in students’ proficiency level is based on the levels relevant to the students in this study, as shown in Table 1 (A2, A2+, B1, B1+, B2). For instance, an improvement from A2 to B1 is regarded as moving up two incremental levels (from A2 to A2+ and then to B1).

An analysis of the 15 students (37.5% of the class) who opted for the retake reveals several noteworthy trends. First, more students improved than declined. Second, the nature of these score changes had different impacts on proficiency levels. Many students in the improved group made substantial gains, enough to advance them by one or even two proficiency levels. Conversely, while students in the worsened group saw their scores decrease, these declines were not significant enough to reclassify them into a lower proficiency level. Third, as illustrated in Figure 1, the magnitude of the score shifts was not symmetrical; the *Score Improved* group exhibited significantly larger changes in their scores than the *Score Worsened* group.

**Figure 1**

*Score Changes: Speaking Proficiency Test (Fall 2024 vs. Spring 2025)*



4.1.2. Course activities and assignments

To foster critical thinking and creativity, one activity required students to watch a video about a visually impaired foreign entrepreneur living in Taiwan. They then engaged in a group discussion, completed an individual written task, and designed a novel assistive device. Student inventions were varied and innovative, including canes with integrated radar and sensor-embedded shoes. Students described how they function and even provided illustrations to help us understand (Figure 2).

**Figure 2**

*Student Illustrations of Inventions for the Visually Impaired*

|  |  |
| --- | --- |
|  |  |

4.1.3. Semi-structured interview and field notes

Qualitative data offer a unique lens to capture students' obstacles, thoughts, and changes in ways that quantitative data cannot. To illustrate this, Table 3 summarizes selected excerpts pertaining to speaking skills from two sources: semi-structured interviews with students (coded as S1, S2, etc.) and field notes from the teaching/research team (coded as TR1, TR2, etc.).

**Table 3**

*Selected Excerpts on Speaking Skills*

|  |  |  |
| --- | --- | --- |
| Data source | S/TR N0. | Transcripts |
| interview | S21 | In the beginning, I just wanted to earn extra credit. Gradually, I wanted to seize the opportunity to speak in English. |
| interview | S23 | The question I answered wasn’t difficult, and I knew I would not be laughed at. |
| interview | S6 | Before college, I often had stage fright. When speaking, I worried that my hand would tremble. The first time the teacher passed the microphone to me when I raised my hand, fearing that my hands would tremble, I said, “I don’t need the microphone. I’ll just speak up.” The second time when I had something to share, I said the same thing, but the teacher didn’t hear it. The microphone was passed to me and I used it. Ever since that time, I no longer have the fear. I still often think about that incident (that freed me from my fear). |
| interview | S18 | Canva (online collaborative whiteboard) is a good idea because some students do not feel comfortable sharing their ideas through speaking. |
| interview | S10 | I wait till someone else speaks first. Once someone begins, I know I can do that, too. |
| interview | S5 | Expressing in English is challenging for me. For most of us, the way we learned English was through reading and writing. My speaking proficiency is not as good as my reading proficiency, but this may be related to how we practiced English (in the past). After all, we were not tested on oral proficiency in most tests… **In more in-depth discussions, I hope to be able to express my thoughts clearly.** |
| field notes | TR2 | Some students answered questions in the Four Corners game despite speaking hesitantly or with limited English fluency. |
| Field notes | TR5 | When phone use was restricted during activities, students were more likely to think critically about the questions presented to them. They were also more attentive and participate more in the activity. |
| field notes | TR3 | … Four Corners game… many important topics and thought-provoking questions… the question “Why are refugees often not welcomed in some countries?” received a lot of enthusiastic responses… I observed that even students who seldom raised their hands volunteered to participate. The activity effectively encouraged critical thinking and speaking, making the class livelier and more engaging. |
| Field notes | TR4 | I observed significant student improvement in participation and language proficiency since the start of the course. They are more confident and willing to answer questions in class discussions. I have also observed progress in their fluency. Their answers have become more natural and with less hesitation. |

Twelve interview participants identified key barriers to speaking, including lack of vocabulary (n = 8), fear or anxiety (n = 5), difficulty with grammar (n = 4), and the challenge of real-time translation (n = 4). One student (S23) noted that while he was initially unable to express his thoughts spontaneously, he later figured out how he could have articulated them. Another student (S38) shared that she had intended to contribute an idea, but gave up when she needed a particular word to express the thought and was unable to find it online.

Qualitative data revealed that students initially found expressing thoughts in English challenging, but noticeable progress emerged over time. Some students experienced a mindset shift, embracing the opportunities to practice speaking, consciously venturing beyond their comfort zones, and mustering the courage to share ideas. While some anxiety was observed, students' enthusiasm peaked when discussion topics were more relevant.

***4.2. Co-construction of critical thinking***

To address the second research question (RQ2: *In what way is critical thinking co-constructed by the students and an instructor within an instructional context that incorporates AI-generated questions on social or global issues?*), data were collected through field notes and semi-structured interviews. A recurring theme identified in the interview data was animal testing, mentioned by half of the student participants (n = 6) in response to the prompt: “*Among the social or global issues discussed in class, which resonated with you the most?*” The theme “the danger of silence,” advocating speaking out and stressing the power of a single voice, was the second most frequently mentioned, cited by one-third of the students (n = 4).

Animal testing often goes unnoticed in Taiwan. Many students in our class, for example, acknowledged that they were unaware of the issue until our discussion. To spark conversation, we watched "Save Ralph," a stop-motion documentary animation about a lab rabbit. Ralph's seemingly calm acceptance and understated descriptions of his harsh reality deeply affected viewers, prompting an engaged discussion. We also screened "The Danger of Silence; The Power of a Single Voice," a TED Talk where the speaker recounted his transformative journey of confronting a family tragedy, detailing its consequences and ultimate impact. Other themes identified included refugees and food waste/fast fashion, each mentioned by two participants. Selected excerpts relevant to critical thinking are shown in Table 4.

**Table 4**

*Selected Excerpts on Critical Thinking*

|  |  |  |
| --- | --- | --- |
| Data source | S/TR # | Transcripts |
| interview | S21 | I personally don't support animal testing. There are other alternative solutions that can replace it. When we covered this in class, we watched a video about rabbits. After seeing it, I felt it was pretty awful. It's really not good. It left a strong impression on me. It feels like data analysis, using computer data analysis, would be much better than animal testing for this kind of research. This is an issue worth thinking about. |
| interview | S1 | (On animal testing) I sometimes buy beauty products, but I've never paid attention to whether they have that kind of label on them. I just haven't seen one yet. |
| interview | S24 | I would begin by breaking down the issue into key areas, such as cosmetics and medicine. I would examine the pros and cons of each area before analyzing them. I see no need for animal testing in cosmetics, but in medicine, its broader impact and human benefits make it more justifiable. |
| interview | S16 | I would start by researching information about the issue to understand the potential benefits and drawbacks. Then, I would analyze which carries greater weight. For example, even if there are many advantages, a single fatal flaw might outweigh them all. In that case, I wouldn't support it. |
| interview | S5 | Taiwan's media is still relatively limited, so if we look elsewhere, we can access a broader range of perspectives or more complete records. |
| class activity | S18 | (Sharing thoughts on Canva whiteboard) Writing is a way of seeking an outlet, allowing papers and words to carry these emotions. |
| field notes | TR1 | Although typically quiet in class, S5 demonstrated a high level of critical thinking during his individual interview. He was articulate, thoughtful, and thorough in his responses, ensuring he understood each question and supported his answers with examples and explanations. The format appeared to ease his reservation, allowing him to articulate detailed ideas and analyses far more readily than he did in class. |
| field notes | TR2 | Students were able to share knowledge and information about current events (e.g., the earthquake in Myanmar). They provided many new viewpoints in their answers. |
| field notes | TR1 | After class, S6 approached me to share his thoughts on the final question about technology in the Four Corners game. He stated, "Some countries will develop destructive high-tech weapons which will be bad for the world." |
| field notes | TR2 | Students play the Undercover game in the TA session… They have to be creative in order to describe the words they have. |

Students’ responses were more diverse when asked to reflect on whether any class discussions led to a change in their perspective or behavior. Relevant interview questions included: “Can you share an example of a social or global topic discussed in class that influenced your thinking?” and “Was there a particular discussion that made you reflect deeply or change your perspective, behavior, or attitudes?” Two prominent themes that emerged were communication (n = 5) and stereotypes (n = 3). Materials for these two themes are short animations, briefly described as follows.

*The Art of Communication* (2-minute animation; theme: communication): This video illustrates diminished emotional presence and the effects of digital distractions, depicting psychologically disengaged characters with “transparent faces” in various social contexts (e.g., friendly gatherings, professional meetings, and parenting scenarios). It aims to raise awareness about the widespread issue of smartphone addiction.

*Snack Attack* (5-minute animation; theme: stereotypes): With no dialogue, this impactful story of an old lady and a young punk challenges our first impressions. It is a powerful exploration of stereotypes, prejudice, and unexpected, simple kindness.

Additional topics mentioned included food waste (two students), visually impaired individuals (one student), refugees (one student), and wars and religions (one student).

It should be noted that, even in our friendly, respectful, and welcoming classroom, some students seemed more at ease sharing their thoughts in small groups or privately with the instructor or TAs after class. Regardless of how they occurred, we encouraged students who willingly shared their ideas with us.

5. Discussion

This section discusses the results of the current study in two areas: speaking proficiency and AI and critical thinking in language education.

**5.1. Speaking proficiency**

The results indicatethat the four main challenges for speaking are: lack of vocabulary, fear of anxiety, difficulty with grammar, and real-time translation. During the interview, when students reflected on the question of speaking (*Do you find sharing thoughts in English challenging? If so, what may be the causes?*) One student (S23) mentioned that he was not able to express his thoughts on the spot, but later on, he was able to work out how he could have expressed himself. Another student (S38) almost shared a thought, but an unfamiliar word she could not find online led her to give up. The instructor, unfortunately, was not aware of her struggle at the time, which meant a missed chance for a teaching moment. Given more time to reflect, access resources, and organize their thoughts, and with some guidance, they could overcome these challenges.

It is important to note that students were placed into this intermediate-level Freshman English class by the university's Language Center based on their college entrance exam scores. Crucially, this English exam does not assess speaking proficiency. Consequently, while a student's placement may reflect their abilities in reading, listening, and writing, it is not an accurate indicator of their speaking skills. This discrepancy is often rooted in a high school curriculum focused on preparing for standardized tests, a system that, as one participant mentioned, seldom provides opportunities for students to practice speaking in English.

“This class changed my entire view of learning English. In high school, we worked on question after question to prepare for the exams. We did not have a chance to practice speaking in class. *Freshman English* is very different, focusing on listening and speaking, allowing for more interactive speaking activities.” (S6)

This sentiment was echoed by another student who articulated, “It may be because of the educational system that students focus more on reading and writing, and are less willing to speak.” (S18) Likewise, S5 expressed, “For most of us, the way we learned English was through reading and writing… but this may be related to how we practiced English (in the past). After all, we were not tested on oral proficiency in most tests.” (complete excerpt in Table 3)

The transition from test-oriented secondary education to the university's communication-focused English courses required a substantial adaptation from students. Recognizing that language anxiety, often rooted in a fear of mistakes or peer criticism, could inhibit participation, the instructor cultivated a supportive, low-pressure environment. This was achieved by allowing students time to become mentally ready, providing both verbal and written channels for expression, and not forcing interaction. This pedagogical strategy, combined with respectful peers, proved effective. For instance, one student's anxiety diminished after realizing classmates "did not pay close attention to mistakes" (S23), while another found speaking less challenging because of the supportive and respectful atmosphere created by his classmates (S25). Consequently, the cohort gradually demonstrated greater articulateness and willingness to share, particularly in the second semester. This environment even enabled a student with prior traumatic experiences in high school to overcome her disengagement and become one of the most active participants (TR1).

Taken together, for students from test-driven backgrounds, a low-anxiety, interactive, and supportive environment is essential for overcoming past educational conditioning and developing communicative competence.

**5.2. AI and Critical Thinking in Language Education**

Technology encompasses a broad range of tools, from everyday devices to advanced artificial intelligence (AI), which has raised concerns not only about academic integrity but also about its long-term impact on students’ critical thinking. While the rise of AI is widely regarded as inevitable, its full implications remain uncertain, even among experts.

The integration of AI into education has expanded the instructional toolkit available to language educators. When used with clear pedagogical intent and professional discretion, AI is a useful aid for creating content on specific areas, adapting materials for different purposes, and crafting questions that foster analysis, comparison, ethical reasoning, and personal reflection. However, it is essential to establish a mutual understanding between educators and students regarding the appropriate use of AI, particularly in tasks that require critical thinking. The intent behind its use is crucial: employing AI to gather examples or verify information can enhance learning, much like consulting traditional library resources. In contrast, when students rely on AI to bypass the cognitive effort required for independent evaluation or original thought, such as copying content without reflection or failing to form personal viewpoints, their learning is significantly compromised.

Meaningful learning is fostered through the active processing of information, which is fundamental to developing a deeper understanding of complex issues. Classroom instruction plays a vital role in modeling the boundaries between human reasoning and AI assistance. Learners should be encouraged to engage in independent thinking before turning to AI for supplemental input or extended inquiry. Our classroom practice involved giving timely reminders in the classroom that helped students maximize independent thinking and problem-solving before turning to devices for further exploration.

A common misconception among students is that faster responses or greater quantities of information translate to better performance. However, it is through the deliberate, time-intensive processes of human reasoning, evaluation, and synthesis that critical thinking is truly cultivated. When thoughtfully integrated, AI can serve as a powerful tool for supporting students’ development as autonomous thinkers in an era of information overload.

6. Conclusion

This study investigated the impact of a co-created, issue-based curriculum on the speaking proficiency and critical thinking of Taiwanese university freshmen. The findings reveal that students' speaking skills lagged considerably behind their receptive skills. However, over the nine-month course, students demonstrated improvements in their confidence, effectiveness, and fluency when articulating their opinions.

A key part of the course design was incorporating contemporary social and global issues. By engaging with authentic materials and human-AI collaborative discussion questions, students were guided through a process of individual reflection and corporate dialogue. This process of co-constructing knowledge and skills helped them develop into more well-rounded critical thinkers, capable of evaluating and synthesizing information from multiple perspectives. The co-created curriculum also effectively raised students' awareness of global topics, some of which were previously unknown to them.

Several limitations require acknowledgment. Given our small sample size and the homogenous student demographic, all from the College of Engineering, generalizations should be made with caution.

Future research could aim to include students from more diverse academic backgrounds to establish the broader relevance of these findings. Furthermore, developing speaking proficiency in an EFL context is a long-term process. Future longitudinal research on the same cohort could better illuminate the developmental path of speaking proficiency in relation to other language skills. Such research would provide valuable insights into the acquisition of oral proficiency for learners in EFL environments.

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**Bionote**

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1. *BEST* in *BESTEP* refers to “Bilingual Education for Students in College (in Taiwan)”, and T*EP* in B*ESTEP* refers to “Test for English Proficiency.” *BESTEP* is an English language proficiency test including listening, speaking, reading, and writing skills, which was launched in Taiwan in late 2023. More details can be found at:

   <https://bestep.tw/eng/About/page?id=9242668c85cb48e192ec1e90ac76cd94> (accessed July 6, 2025) [↑](#footnote-ref-1)
2. Proficiency levels in *BESTEP* are similar to the six-point scale in the *Common European Framework of Reference for Languages* (CEFR) framework. Only levels relevant to the students are included in the table. *Below A1* is the lowest level, and *C1 or above* is the highest level. More detailed information is available on the BESTEP site: <https://bestep.tw/eng/About/detail?id=ba52986d9b474880ba8f45aa75439f50> (accessed on July 6, 2025) [↑](#footnote-ref-2)