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The linguistic leap: Understanding, evaluating, and integrating AI in language education

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Abstract

The landscape of language education is undergoing a pivotal transformation, spurred by the integration of Generative Artificial Intelligence (Gen-AI) into every facet of traditional and new methodologies and practices. Given the rapid societal adoption of AI, we believe that all language instructors – from the most technologically savvy to the most tech-averse – must engage critically and ethically with AI. To ensure that AI tools are brought into language education in pedagogically appropriate and ethical ways, we have developed two large projects at our university: 1) an AI Working Group in our Modern Languages Department and 2) a chatbot that all instructors can incorporate into their classroom practices. In this article, we describe the rationale for these projects and the steps we took to implement them. We hope that this work can help other departments come together to address the challenges and achieve a balance between technological advancement and the intrinsically human facets of language education.

Keywords   artificial intelligence (AI), generative-AI, language learning, educational technology, pedagogy, ethical considerations

1. Introduction

Language learning has been experiencing digital revolutions, from tape recordings in "Language Labs" in the 1950s, to computer assisted language learning (CALL) in the late 20th century, to Google Translate in 2007. And today, the incorporation of Artificial Intelligence (AI) into language education not only stems from a continuation of increasingly technological trends but also demonstrates an exponential evolution which opens the way to new, exciting and possibly troubling horizons. AI and especially Natural Language Processing-powered (NLP) technologies offer the ability to analyze vast language datasets and extract specific linguistic information, enabling personalized learning experiences that were previously unattainable with traditional tools alone (Siemens & Burr, 2013). The recent technological opportunity stemming from Large Language Models (LLM) and conversational AI agents (i.e. ChatGPT, Claude, Copilot, Gemini, etc.) promises a more nuanced understanding of language acquisition and pedagogy, from foreign language learning to writing, argumentation, and research skills. Burdick et al. (2012) lay the foundation for this integration, suggesting that the transition to digital in language pedagogy--even before AI--is not a mere transfer of medium but a redefinition of the field's boundaries and methodologies. The digital space is no longer just a repository but a dynamic and interactive platform for scholarly and pedagogical innovation. This ultimately suggests that AI will become a cornerstone for developing new theories of how languages are learned and taught. This pivotal moment in language learning thus compels scholars and educators to reconsider how we use technology to facilitate language acquisition.

In the midst of these opportunities, however, many language educators, both across the world and in our own institution, are hesitant to embrace AI for in-class or at-home assignments. This hesitation manifests itself into a host of concerns, from pedagogical worries about academic integrity to suspicions about the technology's role as a tool or a replacement for educators, and AI's (in)ability to improve educational equity and the risk of perpetuating and exacerbating biases. These apprehensions stem from the multifaceted aspect that NLP and AI technologies bring along as they become better at "understanding" human language and performing increasingly detailed and skilled tasks.

2. Human vs. The Machine, Human + Machine: Concerns and Confidences

When AI first emerged broadly on the educational scene in the fall of 2022 with the public launch of ChatGPT, pedagogical concerns about academic integrity were front and center. Warnings about the "Homework Apocalypse" and instructors' inability to detect AI use were everywhere (Firat, 2023; Mollick 2023). Essays such as "I'm a Student. You Have No Idea How Much We're Using ChatGPT"

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warned professors in the *Chronicle of Higher Education* that they were being duped by cheating students in every class, at every moment. After explaining his AI-assisted process, the student author explained that "No human or machine can read a paper like this and find the mark of artificial intelligence" (Terry, 2023). AI has continuously improved and increased its performance in NLP, Natural Language Understanding (NLU), and Natural Language Generation. As an example, tools such as HeyGen, which allows anyone to upload an avatar of themselves and have it speak in any language, using their own voice and moving their lips as if they were speaking, are particularly worrisome for language instructors. However, such tools, if properly integrated, could improve the overall learning experience for students, as HeyGen could be used as an oral presentation tutor, which shows the customized best practices for pronunciation, posture, and body language, provided that these goals are explicitly stated when the use of such a tool is officially permitted. Ultimately, a successful integration of tools of this capacity would make it possible to ask students for a deeper reflection on their learning at home and in class content.

Concern regarding pedagogical workload that the inclusion of AI in the classroom would entail also poses a significant challenge for educators and further exacerbates resistance regarding such technologies. Educators who are still recovering from the technology changes and challenges they faced during the COVID-19 pandemic, may remain reticent to AI for having to change their pedagogical approach yet again. Cuban (2001) analyzes the historical pattern of resistance within the education system against integrating new technologies into the classroom. He finds that educators often question the efficacy of technology in improving educational outcomes, given past experiences where technology's promises have fallen short. However, in their review of AI promises and challenges in education, Celik et al. (2022) show that such teacher-facing systems have also been shown to reduce drastically the educator's workload in some metrics like in collaborative knowledge construction (Roll & Wylie, 2016), monitoring student progress (Gaudioso et al., 2012; Swiecki et al., 2019), or automated grading systems (Heffernan & Heffernan, 2014). Hashem et al. (2023) have also found that the introduction of Generative AI such as ChatGPT as a teacher assistant optimizes teacher planning and content development which the authors identified as being significant factors in teacher burnout. Finding ways to limit the additional workload the inclusion of AI into our classrooms would entail while maximizing the efficiency of such tools to the service of educators, and therefore ultimately reducing their workload, are elements that motivated the creation and development of the AI workgroup and AI tutor tool we present in this article. We are aware that AI cannot be successfully integrated in education without having an open dialogue surrounding its implementation and without building a set of guidelines that serves to bridge the gap between the human and the machine.

Outside of logistical and workload concerns, educators are also worried that AI could start depersonalizing education, undermining the teacher's role, and reducing the quality of human interactions essential for language learning (Cuban, 2001, p. 164-165; Ifelebuegu, 2023; Kuhail, 2023; Tlili et al., 2023). Human-human interaction is essential in education and in foreign language teaching specifically as, for most students, the classroom is the only place where they are in contact with and use the foreign language they are learning. However, AI technologies like conversational AI agents, if appropriately included in the curriculum, can also allow for more efficient exposure to the target language outside of the confines of the language classroom. In their article, Ifelebuegu et al. (2023) point out advantages and opportunities that AI presents and especially for students. Conversational AI agents can, for example, provide personalized learning, tailored to a student's strengths and weaknesses, and assist students in their homework by offering exhaustive explanations, facilitating problem-solving, and reformulating complex concepts. Just like any tool, the way one uses AI determines its efficacy in its intended purpose. Therefore, it is the goal of the AI working group here at the University of Miami (UM) to account for the concern of depersonalized education by creating a set of guidelines that would maximize the usefulness of AI technologies outside of the classroom for a more personalized, holistic, and efficient at-home learning experience. This in turn could maximize the interaction between the students and the educator in the target language in class.

Another important concern is the way AI is being hailed as a way to level the playing field of educational access and equity. Educators have pointed out that technological changes largely revolve around institutional infrastructure, and technology often becomes a barrier to access and perpetuates the digital divide (Selwyn, 2016). Underfunded institutions may lack the basic computer hardware necessary to support AI applications, let alone the more advanced systems AI requires. Further, the maintenance and constant updating of self-made LLM AI systems demand ongoing financial and administrative support, which can be prohibitive for institutions with limited resources. Thus, students from disadvantaged backgrounds and the institutions that hope to serve them are now faced with an additional layer of disadvantage in relation to other students and institutions (MLA-CCCC, 2023).

Acknowledging the valid concerns raised about the potential for AI to inadvertently widen the digital divide, some proactive steps can be taken to address this issue head-on. Our solution is the development of our very own chatbot, designed with inclusivity at its core. This chatbot will be made available equally to all of our students, ensuring that every individual has access to this advanced learning tool regardless of their economic background or the resources of their secondary institution. By creating a chatbot that is universally accessible, we aim to democratize access to AI, thereby leveling at least our playing field. This initiative reflects our commitment to not only harness the potential of AI to enhance educational outcomes but also to do so in a way that is mindful of equity and access, ensuring that technology acts as a bridge rather than a barrier to learning opportunities.

Other concerns to have in mind when employing AI's potential is about the inherent (im)partiality. To certain

educators, it seems that AI perpetuates biases in language education. AI systems are only as unbiased as the data they are trained on; if this data contains biases, the AI will likely reflect and even amplify these biases. There are ways to reduce the biases of datasets used to support AI infrastructures. Holstein, McLaren, and Aleven (2019) discuss the co-design of AI tools that support the complementarity between teachers and AI, which can help mitigate biases by ensuring that the AI does not operate in a vacuum but rather in tandem with educators who can provide context and nuance. At the moment, however, the rush to incorporate AI into every device and platform threatens to overtake the slower processes of bias reduction. Thus, it is essential to harness AI's unique ability to identify and challenge human prejudices. AI can reveal inherent biases through data analysis, offering an opportunity to confront and correct them. Furthermore, by providing diverse perspectives on subjects, AI encourages a more inclusive educational dialogue. The key to mitigating biases lies in ethical AI development and its collaborative integration with educators, ensuring AI complements human judgment and enriches learning. This approach not only addresses biases but also promotes a more equitable and comprehensive educational environment, leveraging AI's transformative potential responsibly. In addition, it is important to recognize that AI assessments can overcome human biases, providing a standardized and objective analysis of language use, grammar, and style, eliminating personal biases sometimes imposed by evaluators (Burstein et al., 2013, p. 61). Finally, by creating our chatbot through a collaborative workgroup process, we aim to build localized faculty expertise into the end result. Starting with "local" needs and responses enables our academic unit to take agency in AI technology integration rather than wait for a more depersonalized administrative office on campus to project other institutional motivations and processes onto our pedagogical and programmatic needs and strategies. All in all, our technology is sourced in the specific struggles and opportunities in our department, which will increase faculty and student "buy in" and, we believe, lead to a more sustainable (and appreciated) integration of AI into our classrooms.

3. Our Approach

Given the growing use of AI among students, educators, and universities, the only sensible path forward requires us to update our pedagogical strategies, revise our assessment methods, and enhance our digital ethics training for both students and instructors. This comprehensive approach will allow us to harness AI's unique and stunning potential benefits, such as the ability to create highly personalized and adaptive learning experiences that radically transform the traditional, one-size-fits-all approach to education. In response to these evolving educational dynamics, we launched two major initiatives:

1. The formation of a Faculty Working Group on AI, which includes representatives from each of our primary language programs along with other support faculty, such as the director of the Writing Center. This group is tasked with exploring innovative AI applications within our curricula, ensuring that our pedagogical methods remain at the forefront of technological advancements. Their efforts aim to foster a collaborative environment where AI tools are seamlessly integrated into teaching and learning processes, enhancing educational outcomes while maintaining ethical standards.

2. The development of a proprietary chatbot designed to work within each instructor's class as an aid to student learning. This chatbot, tailored to meet the specific needs of our diverse student body, will offer real-time, personalized assistance, facilitating a more interactive and engaged learning experience. By acting as a supplementary resource, the chatbot will not only address immediate educational needs but also encourage students to explore subjects more deeply, fostering a culture of curiosity and continuous learning.

These initiatives are just the beginning of our objective towards fully integrating AI into our educational framework. In the short term, we aim to implement these technologies in a pilot phase, gathering feedback from both faculty and students to refine our approach. In the long term, our goal is to establish a model for AI-enhanced education that can be adapted and adopted by other institutions, setting a new standard for personalized, effective, and ethically responsible teaching and learning. Through these efforts, we plan to not only navigate the challenges presented by the digital age but also to unlock the full potential of AI in education, ensuring our students are well-equipped for the future.

3.1. Faculty Working Group

The goal of the Working Group is to develop and evaluate different means of integrating AI into the language classroom, test and analyze these strategies in a pilot study, and use the empirical data from the study to create a comprehensive resource guide. This guide will be designed with a particular eye toward faculty members with limited experience using AI programs. This guide will facilitate the integration of AI into language teaching in an ethical and pedagogically appropriate way, covering classroom activities, at-home assignments, and AI resources such as tutoring. The existence of the Working Group and forthcoming Resource Guide will normalize faculty discussions about AI, alleviate tensions caused by uncertainties about how students are using AI, and boost the confidence of new and experienced instructors alike as they incorporate AI into their courses.

Our Working Group met 5 times during the spring 2024 semester, designed around the following plan:

Table 1. Details of the Five Sessions of the Working Group

	Objectives	Group Progress	Specific Activities
Session 1	Introduction to AI in language learning	Establish seminar goals and expectations	- Overview presentation on AI in language learning - Define key terms and concepts - Initial brainstorming session on potential AI tools and methodologies
Session 2	Familiarize individual participants with prompting strategies and ways in which language tweaks altered AI output	Created subgroups designed around specific languages, language level, and content	- Participants analyzed verbs for prompts - Participants identified connected specific verbs with the output generated by the AI
Session 3	Pedagogical Strategies for AI Integration	Development of integration strategies	- Workshop on designing AI-enhanced lesson plans - Guest speaker on AI pedagogy - Small group discussions on strategy implementation
Session 4	Challenges and Solutions in AI Integration	Identification of potential challenges and getting closer to assessment	- Case study reviews of AI integration challenges and solutions - Roundtable discussion on overcoming obstacles - Compilation of resources and support networks - Assessment enhancement and resources
Session 5	Presentation of Projects and Future Directions	Showcase of group projects; planning next steps	- Final presentations of AI-integrated language learning projects - Feedback and evaluation session - Discussion on future trends and opportunities in AI and language learning

Twelve faculty members were accepted into the Working Group and provided with small research stipends from our university's College of Arts and Sciences. The faculty members include tenured faculty (2) tenure-track faculty (1), senior lecturers (7), and lecturers (2). The languages taught by these faculty include French, Spanish, Italian, and Japanese at all levels. We also have included faculty with pedagogical expertise in computer science (1) and English writing (1).

Building on the diverse and interdisciplinary composition of the Working Group, the department has initiated an AI Seminar Series aimed at furthering the conversation around AI integration in language learning. This series provides a forum for the Working Group to share their findings, methodologies, and insights gained from their research stipends. The seminars cover a range of topics, from practical applications of AI tools in language classrooms to ethical considerations and the future of AI in education. By including faculty with expertise in computer science and English writing, the seminars foster a multidisciplinary dialogue, enriching the discussion with perspectives on AI's broader implications for pedagogy and student engagement. This initiative not only supports the professional development of our faculty but also cements our department's position at the forefront of innovative teaching practices, ensuring our students benefit from the most cutting-edge educational technologies.

3.2. Language-Learning Chatbot

The motivation behind building the AI tutor is to utilize all the potential of AI technologies and put them to the service of education and language instruction, while we

remain in control of its capabilities and its use. By designing this AI tutor ourselves, we are able to take ownership of this technology therefore guaranteeing a safe environment catered to the particular needs of our faculty members and student population. Our chatbot will harness the technical affordances of AI to combine with instructors' pedagogical and content knowledge, creating initially, close collaboration with instructors, and gathering comprehensive curriculum content and embed effective teaching strategies into the chatbot's design, leveraging AI capabilities like NLP to develop a system that not only understands student inquiries in real-time but also personalizes the learning experience based on individual needs and feedback. This approach will involve continuous testing and refinement, incorporating real student and instructor feedback to ensure the chatbot serves as a dynamic, adaptive learning tool. By integrating this AI-enhanced chatbot into our educational toolkit, we aim to create a multilayered learning environment that continuously adapts and responds to the diverse needs of our students, making language learning more personalized, engaging, and effective.

Furthermore, our work on the Chatbot is guided by the Computational Theory of Mind, as suggested by Pinker (1997), which proposes parallels between AI language processing and human cognitive functions. In the context of AI, this requires platforms to model and anticipate learner responses. It fosters an educational experience that respects human values and complements human intelligence, thereby positioning AI as a pivotal element in the evolution of pedagogical strategies and educational paradigms. In proposing a discourse diagram for incorporating Gen-AI in the educational experience cycle, we adapt Lewin's (1951) action research model and Kolb's

(1984) interpretation to our modern AI-enhanced mindset. This adaptation involves integrating AI across all facets of the learning cycle: Plan with AI, leveraging AI to inform and design educational strategies; Act with AI, through the implementation of AI-driven learning activities; Observe the replies, by utilizing AI tools to gather and analyze feedback from learnings; Reflect on the replies, by employing AI to evaluate the effectiveness of instructional approaches; and finally, Conceptualize with AI, by using AI to synthesize new educational concepts based on insights gained. This cyclical process, enriched by AI, promises to revolutionize educational practices, making learning more personalized, efficient, and aligned with the cognitive processes of learners.

Our Chatbot AI will track learners' progress, identify areas where they struggle, and adjust the difficulty of tasks accordingly. In order to support learners at their own pace while promoting engagement and better proficiency results by focusing on areas that require additional practice. This means that while the LLM still requires adjustments, at times with long unfathomable prompts, as any language, it will find commonalities and simplify the interactive components to a more natural form. Kojima et al. found that by simply adding "Let's think step by step" before each answer, ChatGPT dramatically improves its performance (Kojima et al., 2023). Prompt engineering represented a pivotal development in the interaction between humans and advanced language-based AI systems, such as ChatGPT, Claude, and Gemini. The term itself may be conceptualized as the nuanced craft of formulating queries and statements designed to elicit the most informative, accurate, or creative responses from AI.

The way we communicate with AI has profound implications for the efficacy and outcome of these interactions. As Bender and Gebru (2021) highlight in their work on the potential dangers of large language models, the prompts given to AI can either mitigate or exacerbate issues of bias, making the careful construction of these prompts an ethical imperative. The relevance of "promptology" is particularly significant in today's educational contexts, where AI can offer personalized language learning experiences. This is underscored by Kelleher (2019, p. 181), who delves into the utility of deep learning for NLP, showcasing how AI can solve complex linguistic problems and tailor educational content to the learner's needs.

For example, our bot will be able to introduce real-time feedback and automated evaluation methods, offering a stark contrast to traditional assessment techniques, which often involve time-consuming manual grading and feedback processes that can delay learning progress. AI systems, like the intelligent tutoring systems discussed by Heilman et al. (2006), extend automated assessment to areas of lexical practice and reading comprehension. These systems not only assess but also adapt to the learner's abilities, offering personalized feedback that aligns with the individual's learning trajectory. This personalized feedback mechanism is instrumental in identifying specific areas where learners need improvement, enabling a targeted approach to language learning that is often not feasible with traditional assessments.

In designing the Chatbot, however, we also recognize Shneiderman's (2020) insistence on ensuring the primacy of human values and skills within AI methodologies and pedagogies. He asserts that the concept of human-centered AI, which posits that AI systems should be designed with a strong emphasis on human values and ethics, needs to be at the core of any integration project (Shneiderman, 2020, p. 112-113). Human centeredness should also take into account protecting privacy and giving individuals control over the level of integration of AI into any given assignment or course. We are therefore taking care to ensure that personal data used by AI systems to individualize learning experiences is securely stored and processed, and that access to this data is strictly controlled to protect the privacy of students. Moreover, we are working to ensure that students have agency over their data, including the right to know what data is collected and the ability to opt-out of data collection.

4. Stakeholder Responses

In a recent survey conducted during the Spring Semester, 2024, involving 47 UM undergraduates, students were questioned about their use of AI tools in foreign language acquisition. The survey aimed to gather insights into students' preferences and experiences with AI technologies as part of their language learning process. Notably, the survey did not collect data on the participants' genders, focusing solely on their interactions with and attitudes towards AI-assisted education. This group, typically aged between 18 and 22, represents a significant demographic in contemporary educational technology research. Based on the data, it is clear that students are actively using AI tools such as Google Translate, and Duolingo, as well as Gen-AI tools as ChatGPT, to support their language learning journey. These tools are being used for a variety of purposes, from clarification of difficult concepts to assistance with assignments and daily practice. The frequency of use varies, with some students using AI tools every day, highlighting their growing importance in the educational landscape. Overall, students seem to appreciate the integration of AI into their learning process, particularly for its ability to provide immediate assistance and diverse forms of help. However, there is a desire for improvements in areas such as mood and context understanding, accuracy, and the introduction of features like pronunciation guidance.

The following figures (Figures 1 and 2) present the conclusions derived from a subset of the questions posed to participants regarding the use of AI tools in language learning. Specifically, these figures summarize responses to questions aimed at measuring the perceived usefulness and the likelihood of recommending AI tools for future educational purposes. For instance, one question asked participants to rate the effectiveness of AI tools on a scale from 1 (Not Useful at All) to 5 (Extremely Useful), providing a quantitative measure of the tools' utility in enhancing language comprehension and proficiency.
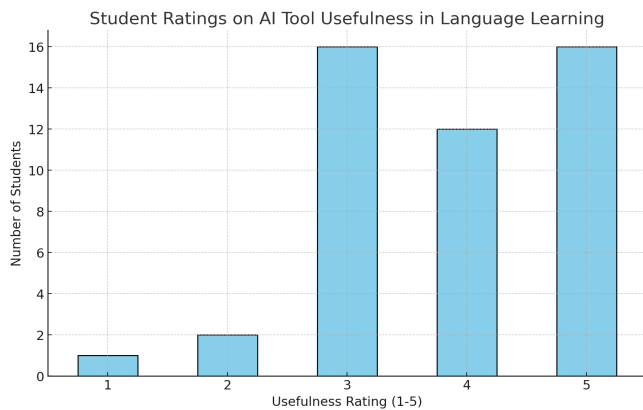
Figure 1. Student Ratings on AI Tool Usefulness in Language Learning

Based on the student feedback on AI tool usefulness in language learning, one can clearly anticipate a positive reception towards integrating AI into the educational process. Figure 1 above showcases the distribution of student ratings regarding the usefulness of AI tools in enhancing their understanding of a foreign language. Most students rate the usefulness of AI tools favorably, indicating a consensus on the benefits these technologies bring to language learning. This feedback underscores the potential of AI to revolutionize traditional language education by providing personalized, adaptive learning experiences that cater to individual student needs. Our initiatives, including the development of a proprietary chatbot and the formation of a Faculty Working Group on AI, are aligned with these insights. These steps are part of our broader strategy to not only address immediate educational challenges but also to lay the groundwork for a future where AI seamlessly integrates into language learning, ensuring all students benefit from these technological advancements.

In a second follow-up survey conducted among the students that were utilizing AI tools for foreign language learning, the data reveals insightful trends regarding the impact and perceptions of AI integration. Notably, 40% of respondents reported a significant improvement in vocabulary, while 25% observed notable enhancements in grammar. These findings underscore the utility of AI in reinforcing key linguistic components. Furthermore, the survey highlighted varying sentiments towards AI, with 65% of participants advocating for its continued use, indicating a generally positive attitude towards this technology. However, responses also showed that there is effectively room for improvement, particularly in developing features that enhance interactive learning experiences. Two quotes from the survey encapsulate the divergent views on AI's role in language learning. On a positive note, one student remarked, "AI has revolutionized the way I learn languages; it allows for quick translations and helps correct my grammar in real-time." Conversely, a critical perspective was offered by another participant: "While the tool is helpful for basic queries, it lacks the depth required for advanced language mastery and cultural nuances." This mixed feedback highlights the potential and limitations of AI in educational settings, suggesting that while AI can be a valuable tool for foundational language skills, there

remains a need for advancements that cater to more complex aspects of language learning. Another question probed the likelihood of participants recommending AI tools to peers and their intentions regarding future use (Figure 2), with possible responses ranging from "Very Unlikely" to "Very Likely." These questions are examples of how the survey sought to quantify and qualify students' experiences and attitudes towards AI-assisted language learning.
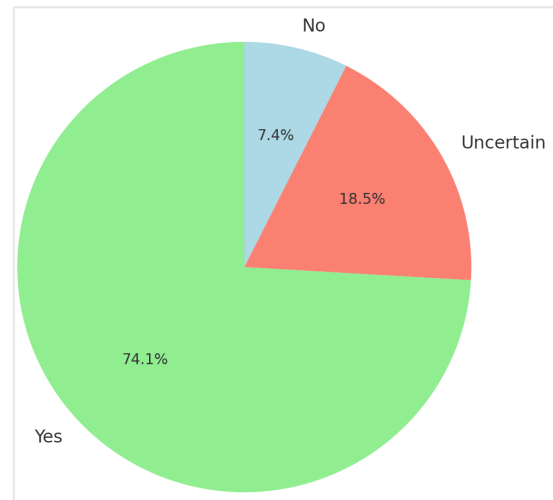
Figure 2. Recommendation for Future Use of AI Tools

The pie chart in Figure 2 shows the distribution of students' recommendations regarding the continued use of AI tools in language learning. It visually represents how many students endorse the use of AI (Yes), do not recommend it (No), or are uncertain about its benefits (Uncertain).

On the other hand, feedback from the faculty demonstrates that 60% of respondents had never used generative AI in the classroom. In addition, 55.6% say that AI *will be* a beneficial tool for education while 44.4 % say that AI *may be* beneficial. Faculty member's greatest concerns focused on the ethical implications of student use of AI (100%) and student reliance on AI for assignments (88.9%). None of the faculty surveyed reported that student use of AI increased their engagement, whether or not AI was used as part of class instruction.

As can be observed, the introduction of Generative AI tools has sparked both interest and doubt among academic professionals. These educators bring forth their assessments, rooted in their extensive experience, to the ongoing discourse on the intersection of technology and pedagogy. One senior lecturer cogently captures the essence of this paradigm shift, stating, "It will be both beneficial and harmful. It will place a burden on instructors but ease the work of students," highlighting the dichotomy of AI as both a facilitator and a challenge in the educational sphere. A professor echoes this complexity, voicing a concern that resonates with the foundational principles of teaching: "It's unclear to me that the benefits will outweigh the drawbacks... less helpful when teaching students to 'learn how to learn' is part of our mission." This sentiment reveals the apprehension about AI potentially overshadowing the development of independent learning skills. Nevertheless, the readiness to adapt and find

constructive applications of AI is also present, as another lecturer reveals an anticipatory stance: "AI is a vast source of information that we can use to improve our lessons."

The qualitative data for the study on the integration of AI in language and content education was primarily collected through an innovative method that combined multiple-choice questions with subsequent prompts asking participants to explain and expand on their selections. This approach allowed for the collection of both structured, quantitative data and the rich, detailed insights typically associated with qualitative data. By prompting educators to elaborate on their multiple-choice answers, such as detailing their use of AI tools in teaching after selecting 'yes' or 'no', the survey effectively bridged the gap between the straightforwardness of fixed-response options and the depth of open narrative explanations. This strategy minimized respondent fatigue while maximizing the depth of data collected, providing a nuanced understanding of how educators perceive and interact with AI technologies. Analyzing these extended responses enabled the identification of common themes and diverse opinions, offering a comprehensive view of the challenges and potential for AI integration in educational practices. This methodological design was crucial in enhancing the research's capability to inform robust, contextually rich conclusions that could guide future AI implementation strategies in educational settings.

These insights from language professors serve as a microcosm of the broader dialogue in academia. They underline the necessity for a thoughtful integration of AI in educational curricula, ensuring that it supports the overarching goals of teaching while navigating the complex implications it brings to the fore.

5. Conclusion

The curricular integration of AI into foreign language education represents a shift towards a more interactive, personalized, and effective learning environment that is already in motion. Embedding AI ethically and usefully into language curricula requires strategic planning and an evolved role for educators, which in an AI-assisted language teaching environment, means to guide, facilitate, and curate the AI learning experience. As suggested by Godwin-Jones (2019), successful class collaboration requires guidance, technological and linguistic support, and opportunities for reflection to navigate and mitigate tensions, thereby enriching the intercultural learning experience. Educators must be adept at selecting appropriate AI resources that align with learning goals and assessing the effectiveness of these tools in advancing language proficiency. Educators also need to be prepared to intervene when AI provides insufficient or inappropriate feedback, ensuring that the nuances of language and culture are adequately conveyed.

Educators must also serve as mediators between the AI technology and the learner, contextualizing AI feedback within the broader scope of language acquisition. They should be equipped to interpret data generated by AI, such as progress reports and analytics, to inform instructional decisions and provide human insight that AI cannot

replicate. The incorporation of AI into the classroom is an important step in teaching students best-practices for its use. Teachers can model appropriate uses of the technology and mitigate instances of cheating and misuse. As seen by the survey, we recognize that AI is a present and proliferating feature of student practices – practices that can be troubling and harmful toward learning, especially if instructors remain uninformed and untrained about AI and its uses. The key findings and arguments presented in this article reveal that AI has the potential to profoundly reshape the way language is taught and learned. Despite concerns about data privacy, bias, and human interaction, AI brings a level of personalization and adaptability to language learning. The evolution of AI in language education promises more interactive and immersive learning environments, and the possibility of a future where AI not only supports but enhances human cognitive processes in language acquisition, as reflected in the work of Luckin's (2018) and Siemens' (2005) connectivism theory.

Technological and pedagogical hurdles, such as inadequate infrastructure and resistance among educators, have been significant barriers to AI's integration into language curricula. These challenges require strategic investments in technology, professional development for educators, slow and phased adoption of new AI-driven programs and processes, and ethical guidelines for the use of AI in education. Final thoughts on this progression suggest a future in which AI acts as a catalyst for innovation in foreign language acquisitions. This future hinges on our ability to harness AI's capabilities responsibly, ensuring that it serves to enrich the educational experience without diminishing the human touch that is central to effective teaching and learning. As we move forward, it's essential that we maintain a balance—leveraging the strengths of AI to enhance language education while addressing the challenges and ensuring equitable access to these transformative tools.

6. Limitations

This pilot study had several significant limitations. It utilized a small, self-selected sample primarily drawn from a single university department. Additionally, the survey instruments employed, including a professor survey, were constrained in their scope and may have been subject to varying interpretations. The chatbot, although eagerly awaited, is still under development and has not been fully implemented. In future research, we aim to engage larger and more diverse groups, refine our survey questions to minimize ambiguity, and involve faculty from various disciplines.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.