



Artificial Intelligence-Supported Critical Translanguaging Pedagogy in Language and Literacy Education: Transforming Teaching and Learning Practices

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ABSTRACT

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Artificial Intelligence (AI) is increasingly transforming language and literacy education by providing new opportunities for personalized learning, multilingual communication, feedback, and digital literacy development. However, the use of AI in language education has often focused on standardized language learning without sufficient attention to learners' diverse linguistic resources and identities. This study examined the role of AI-supported critical translanguaging pedagogy in language and literacy education, with particular emphasis on its influence on teaching and learning practices, multilingual learning, learner engagement, and literacy development. A quantitative research design was adopted, and data were collected from 379 teachers and language and literacy educators selected through purposive sampling from higher education institutions in Punjab and Sindh, Pakistan. A structured Likert-scale questionnaire was administered through Google Forms to measure AI-supported critical translanguaging pedagogy and teaching and learning practices. The collected responses were screened and coded in Excel and subsequently analyzed using SPSS. The findings demonstrated a strong positive association between AI-supported critical translanguaging pedagogy and teaching and learning practices and showed that greater integration of AI-supported multilingual practices was associated with more positive educational practices. The findings further indicated that AI-supported critical translanguaging can contribute to more inclusive, flexible, learner-centered, and linguistically responsive learning environments by supporting multilingual explanation, communication, participation, feedback, and literacy development. The study highlights the importance of using AI not merely as a technological tool for language correction or content generation, but as a pedagogically guided resource that recognizes learners complete linguistic repertoires and promotes learner agency. Overall, the study concludes that integrating AI with critical translanguaging pedagogy can strengthen contemporary language and literacy education when supported by teacher guidance, critical digital awareness, linguistic diversity, and equitable access to technology.

Introduction

Artificial Intelligence-Supported Language and Literacy Education

Artificial Intelligence (AI) has become an increasingly important part of language and literacy education. It supports personalized learning experiences, provides timely and automated feedback, and offers interactive tools for language generation, translation,

and communication. These technologies help learners access educational content more effectively and create new opportunities for improving language learning and literacy development. AI-based applications can help learners refine their reading, writing, vocabulary, and comprehension skills as well as their communication skills. Ji et al. (2024) researched AI-based language learning, and showed that positive effects of language learning on second languages are apparent, especially when Practice and Technology are integrated effectively. In the context of language learning assisted by AI, AI is no longer a technology designed for efficiency, but a technology designed for flexibility and Process. AI has the potential to facilitate innovative language learning processes and activities.

AI is especially important for multilingual classrooms and classrooms with different literacy levels since learners in such classrooms may require a variety of linguistic and cognitive support. AI based generative technologies can provide learners with support when translating, provide explanations, scaffolded writing support, and opportunities to interact with language in multiple formats. ChatGPT can be used to support differentiated instruction and communication for multilingual learners (Donley, 2024). While technology like AI can help learners with language practice and provide feedback for every task with instant responses, thereby helping learners stay engaged, there are also concerns about linguistic equity. AI-based systems are more likely to support dominant languages, thus reinforcing linguistic dominance. Cortez (2025) found that practices mediated by AI Engineering are likely to reinforce inequitable and standardized forms of Language Practice.

Critical Translanguaging Pedagogy

Translanguaging describes how a person employs their full linguistic repertoire to understand, communicate, and construct knowledge in order to participate in an activity or process of learning. In contrast to the linear and prescribed views of different languages, translanguaging assumes that multilingual learners make meaning flexibly, using various language resources. (García-Martínez et al., 2023) describe translanguaging as the use of different language resources in a changing way, in contrast to the use of language resources within a constant and fixed frame. In the area of language and literacy, this idea allows learners to use the resources of the language they are most familiar with, in order to understand and to produce the discourse of literacy.

Critical translanguaging pedagogy provides a voice to the multilingual students and supports their efforts to use their learnings to address the social inequities of identity, power, and linguistic hierarchy. Unlike other pedagogies, critical translanguaging does not only promote the use of several languages, it explains why some languages and varieties are more valued in educational institutions and what the implications of such a hierarchy are for learners. Alvarez-García et al. (2024) note that translanguaging pedagogy must consider the social and political environments of the societies from which the learners come. Pedagogical practices of this type have the potential to influence the existing monolingual practices in an educational setting in the direction of more flexible attitudes and recognition of the most important aspects of academic learning.

In the area of language and literacy, critical translanguaging can assist learners in interpreting and discussing texts and producing knowledge in different languages. One student may use one language to decode a complex idea, and a different language may be used to express an idea. In this context, languages are linked together and translated, rather than viewed as distinct and competing units and systems. Recent studies have noted that multilingual users of AI-generated content can utilize translanguaging to assess translations and keep the meaning of their writing (AL-Khatib, 2025). Given this, critical translanguaging pedagogy allows multilingual users to operate within linguistic agency when confronted with modern educational systems or devices.

AI-Supported Critical Translanguaging Pedagogy

The integration of artificial intelligence with critical translanguaging pedagogy combines AI technologies, multilingual language practices, and critical educational approaches to create more inclusive, flexible, and meaningful learning experiences for students from diverse linguistic backgrounds. In this type of pedagogy, AI can perform a variety of tasks such as translation, explanation, feedback, and vocabulary. Translanguaging allows learners to select and operate varying AI resources based on their multilingual competence. Based on (Yıldız Kopuz et al., 2026) the combination of translanguaging pedagogy and AI as multilingual resources is a growing area of language pedagogy as teachers help learners utilize the resources critically.

AI-based language generation should not be merely assumed to have neutral language or be linguistically inclusive. AI systems learn from increasingly larger data and therefore can learn to reproduce standardized language. (Wang et al., 2026) showed multilingual learners face a dilemma between AI-based standardized English and their bilingual or multilingual identities. Therefore, critical translanguaging triggers learners to determine how resources generated by AI should be reconciled with their communication and literacy practices.

AI can also help students of the classroom exercise greater control over the learning and teaching process as well as improve their participation. In this regard, students can use AI, for example, to obtain explanations or translations, and then determine whether these outputs represent their intended meanings. In addition, Waluyo and Rouaghe (2025) found that students translated difficult language using AI-based translation, and this exercise improved their overall language understanding. AI should be a promoting tool to support teachers. It will not replace a teacher, student's knowledge of language, or student's ability to think and decide critically.

Relationship Between AI-Supported Critical Translanguaging Pedagogy and Language and Literacy Education

AI-assisted critical translanguaging pedagogy is relevant to contemporary language and literacy education because it integrates flexible multilingual learning with support. Some AI systems can help learners with instant feedback, and translanguaging can help learners utilize all the languages they know and draw on any language to both interpret and produce knowledge. AI-supported language learning has shown positive effects. For this reason, appropriately developed AI may aid language development. Considering flexible multilingual learning and translanguaging, learners may have more access to content allowing them to better negotiate meaning and engage in literacy. From an equity perspective, AI-supported critical translanguaging is relevant because multilingual learners may have different linguistic barriers (Olorunnisola, 2025).

AI-supported critical translanguaging may facilitate transformative pedagogies in teaching and learning by situating the teachers as pedagogical guides, while learners take up the role of technology evaluators as active users. With tools like AI, students can access information, produce language, translate, generate text, and get feedback while exercising their critical judgment and multilingual understanding. (Godwin-Jones, 2024) argue that the dialogue and interactions with AI-based systems show that multilingual learners negotiate feedback rather than accepting recommendations. From this perspective, AI-assisted critical translanguaging shows a strong inclination toward participating in innovative, inclusive approaches to language and literacy teaching and learning that involve critical approaches.

Research Objectives

- To examine the role of Artificial Intelligence-supported critical translanguaging pedagogy in language and literacy education.
- To assess the influence of Artificial Intelligence-supported critical translanguaging pedagogy on teaching and learning practices.
- To evaluate how Artificial Intelligence-supported critical translanguaging pedagogy promotes multilingual learning, learner engagement, and literacy development.

Problem Statement

The growing use of artificial intelligence has transformed language education by providing tools such as speech translation, speech-to-text transcription, prompt-based assistance, multilingual content generation, and various supports that enhance language and literacy learning. But pedagogy focused on multilingual AI in language education still tends to ignore multilingual theories, and critically oriented multilingual education in particular. Recent studies indicated that different AI systems can help learners with a foreign language; however, a dominant multilingual AI supports only socially normative and dominant (standardized) forms of the language, and so the use of multilingual AI poses equity, agency, and representation concerns for learners of minoritized languages. Still, critical translanguaging studies argue that only when multilingual practices are situated in their social and institutional contexts should they be considered either empowering or disempowering (Cope et al., 2024). Recent research focused on translanguaging pedagogy and AI, intentional incorporation of critical translanguaging, and drawing on AI systems, still remains unexplored and undeveloped. Empirical studies remain limited to particular cases and dedicate little focus to transforming broader teaching and learning. Therefore, in language education, there is an urgent need for translanguaging critical pedagogy that is AI supported, inclusive, and critically oriented, to transform teaching and learning, especially for linguistically minoritized communities.

Significance of the Study

This research is important because it highlights the role of artificial intelligence in supporting inclusive and multilingual approaches to language and literacy education. The integration of AI with translanguaging practices can enable students to use their full linguistic resources while receiving assistance with translation, explanations, feedback, and other learning activities,

thereby enhancing their overall educational experience. It has been found that translanguaging in pedagogy can increase agency, inclusion, and positive disposition towards multilingualism. Teachers are also interested in this study because AI can be used with more critical pedagogy than just being a language checking or curriculum generating program. Translanguaging and GenAI focuses on multilingual learning and the issues of standardization and inequality that come with it. In language and literacy education, the research may add ways to use Artificial Intelligence in tandem with translanguaging to create more inclusive and learner-centered and -driven teaching that enhances agency.

Literature Review

AI-Enabled Language Learning and Literacy Practices

The use of AI as a tool to analyze and correct errors in language generation is no longer the focus for many researchers. Rather, researchers have begun to study the impact of AI on language learning and literacy practices. In their second-language meta-analysis, (Collino, 2026), reported that the effects of AI in language learning depend on both the instructional and situational contexts. They argued that AI would be more valuable in education if used within good instructional design. Current studies have also reported an explosion of AI research over the last two years. A recent review of 144 peer-reviewed studies published from 2023 and 2024 reported a marked interest in generative AI for language teaching and learning.

AI tools also allow automation of a variety of language learning and teaching tasks. AI-based tools can provide learners with drafts and prompts for written work, offer explanations, provide feedback, and facilitate practice through interactive chat. Such tools can provide a high degree of personalization and create multiple opportunities for practice outside. However, the unbridled use of generative AI tools also generates a lot of worry regarding the accuracy, reliance, authorship of text and the quality of texts generated (Kagan, 2027).

Another important problem is the lack of various languages and educational contexts in AI research. A 2025 systematic review of empirical studies on generative AI demonstrated that most of the relevant literature focused on certain regions and educational levels, primarily China and other East and Southeast Asian nations. This shows that the need for research in different linguistic and cultural contexts is still great. Although the existing literature offers significant insights on the possibilities of AI in education, less emphasis has been placed on how AI can help with multilingual language and literacy, recognizing and affirming learners' various linguistic assets (Feng, 2025).

Multilingual Pedagogy and Translanguaging Practices

Research on translanguaging has expanded beyond traditional views of code-switching between two languages. Now, researchers study how multilingual learners utilize multiple systems of knowledge to comprehend, communicate, and engage in learning activities. A systematic analysis of 111 empirical studies conducted in U.S. PK-12 schools reported that translanguaging aided students' understanding, engagement, and collaboration; as well as their sense of identity and belonging. Moreover, the effectiveness of translanguaging varied across different community settings, and thus, the authors of the systematic analysis identified translanguaging as a context-based, pedagogy-related practice, rather than idea or activity that is constant across contexts. Other systematic analyses show that though the research volume in this area has grown, there are still considerable variations in the type and quality of research. (Zhang et al., 2025) reviewed 61 studies and described different translanguaging-related pedagogies. Yet, the authors also expressed that there was an overreliance on ethnographic research. The review documented an insufficient emphasis on translanguaging in the field of multilingual and inclusive education with a focus on critical pedagogy and social justice (Prawiro et al., 2025).

More recent studies have investigated how pedagogical translanguaging has been internalized by teachers. A 2026 systematic review of 160 empirical studies documented the presence of three distinct forms of pedagogical translanguaging: (a) enhancing learners' meta-linguistic awareness, (b) encouraging learners to employ their full linguistic repertoire, (c) and employing different languages deliberately during an activity. The review also found these practices involved the use of multimodal resources and suggested using translanguaging when developing lessons and language curricula. This suggests that using translanguaging when developing lessons and language curricula is increasingly seen as an intentional and goal-directed teaching approach, rather than an informal classroom practice (Luan et al., 2026).

Critical and Equity-Oriented Dimensions of Translanguaging

While most translanguaging research emphasizes the potential of multiple languages, some research focuses on the levels that translate into transformation. (Pujiastuti et al., 2026) argue that the impact of translanguaging is dependent on the linguistic, institutional, and ideological factors of the learners and educators. Under these circumstances, critical translanguaging looks at the languages that are viewed as legitimate, whose linguistic practices are recognized, and how educational systems perpetuate a hierarchy of languages. This type of translanguaging looks at the rights of learners beyond offering multiple languages.

This position is grounded in recent research that shows how translanguaging can be limited by educational institutions. In 2026, an exhaustive study of secondary EFL published research reviewed that although educators used complex translanguaging in class, the practices were limited by the educational institutions combined with teachers' low levels of preparation and strong language ideologies. It is evident that teachers recognize the pedagogical value of multilingual systems, even when they work in educational systems that support a dominant, singular language. This indicates the need for critical censorship when incorporating translanguaging in formal teaching practices.

There is continuing research on the outcomes of these systems. A systematic review of translanguaging and its assumed relationship with the development of second-language reading, for example, showed an interest in translanguaging research, but still a lack of usable data. An earlier systematic review of translanguaging methods in English as a Foreign Language (EFL) classroom reached similar conclusions. Both reviews indicated that lack of empirical research methods inhibited translanguaging studies. For this reason, additional quantitative studies should be conducted to fill the gap left by the lack of qualitative data and examine if the repeated application of multilingual pedagogies has a positive impact on other outcomes in teaching and learning (Xerri et al., 2026).

Emerging Integration of AI and Translanguaging

Generative AI has the potential to provide a unique perspective on the integration of translanguaging within language learning research. Some studies have shifted their focus from the role of AI as a tool to the role of AI in processes where learners use different languages to obtain, form, and express ideas and to accomplish language learning tasks. Translanguaging and AI not only complement each other, but also have a symbiotic relationship. In addition to providing resources, AI also has the potential to process translanguaging efforts.

This complementary relationship is further validated by recent empirical research. One study investigating translanguaging within GenAI-enhanced language class activities found that translanguaging fostered positive achievement emotions and academic engagement. These multilingual practices have the potential to change not only language-related outcomes, but the emotional and active participation of learners. This research thus offers valuable evidence and a new perspective to consider AI-supported translanguaging as more of a pedagogical approach as opposed to a merely digital system of translation (Ocumpaugh et al., 2024).

On the other hand, critical teacher involvement is recognized as a significant gap in the literature. Given the nature of AI, systems are possibly skewed toward dominant-language preferences and can provide wrong information or inappropriate culturally sensitive answers. Even if translanguaging enables learners to compare AI-generated content to their own linguistic and cultural knowledge, this comparison requires critical teaching support. Thus, recent studies support a model wherein AI offers additional linguistic and learning resources, and the teacher determines how these resources can be evaluated and integrated into teaching practices (Mokoena & Seeletse, 2025).

Research Gap

Although research on Artificial Intelligence in language education and research on translanguaging pedagogy have both expanded considerably, the intersection of these two areas remains underdeveloped. A recent systematic review of generative AI research in language learning found that existing studies are concentrated largely in higher education and English as a Foreign Language context, with limited attention to broader language domains and less-represented languages. Similarly, (Maulana, 2026) argue that translanguaging research needs to examine linguistic power, institutional context, and equity rather than assuming that translanguaging is universally empowering. Recent scholarship has begun to examine AI-supported translanguaging, including multilingual explanation, translation, tutoring, and feedback, but this remains an emerging research area and requires stronger empirical evidence regarding how the combined approach can transform actual teaching and learning practices. Moreover, existing research highlights concerns about AI bias toward dominant and well-represented languages, while evidence concerning

minority-language representation and critical use of AI remains limited. Therefore, a clear research gap exists in understanding how AI-supported critical translinguaging pedagogy can be systematically integrated into language and literacy education to promote inclusive teaching, learner agency, multilingual participation, and meaningful learning practices (Restrepo-Widney, 2026).

Hypotheses

H1: There is a significant positive relationship between Artificial Intelligence-supported critical translinguaging pedagogy and teaching and learning practices in language and literacy education.

H2: Artificial Intelligence-supported critical translinguaging pedagogy significantly predicts teaching and learning practices in language and literacy education.

H3: There is a significant difference in teaching and learning practices between participants with lower and higher levels of exposure to Artificial Intelligence-supported critical translinguaging pedagogy.

H4: There is a significant difference in teaching and learning practices among participants with different levels of experience with Artificial Intelligence-supported critical translinguaging pedagogy.

H5: Significant pairwise differences exist between at least two groups with different levels of Artificial Intelligence-supported critical translinguaging pedagogy in relation to teaching and learning practices.

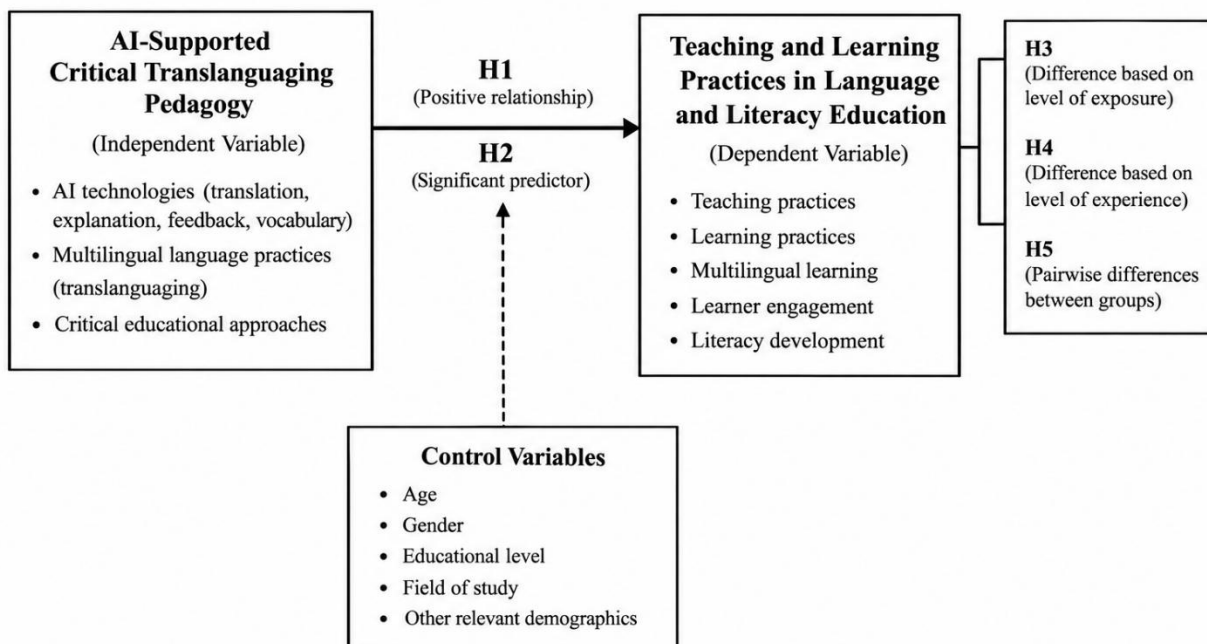


Fig. 1 Conceptual Framework

Methodology

Design of the Research

The research employed a quantitative approach to study AI-based critical translinguaging pedagogy and its role in language and literacy teaching. Used was a quantitative survey to be filled by the study respondents and collect numerical data. The authors

elected to use a quantitative approach because the study analyzed relationships, predictive, and comparative aspects of the study respondents using statistics.

Target Population

The study population consisted of teachers, lecturers, and teachers of language and literacy in the educational domain in Pakistan. The research was conducted in selected institutions in the Punjab and Sindh regions, such as Bahauddin Zakariya University, the Islamia University of Bahawalpur, the University of the Punjab, the Government College University Faisalabad, the University of Sargodha, the Government College University Lahore, the University of Education Lahore, Women's University of Multan, University of Sindh, and other public and private universities. These institutions provided a suitable geographical and educational context for the examination of the use of AI-based multilingual and translanguaging practices in language and literacy teaching.

Sampling

To respondents with the required experience of language teaching, literacy teaching, multilingual learning, or educational technology, a purposive sampling technique was used. The technique was adequate because the research required participants who were able to provide informed responses about AI-based critical translanguaging and teaching and learning.

Sample Size

A total of 379 respondents participated in the research. The respondents were selected from the educational institutions in Pakistan which were considered appropriate for the quantitative research. Responses were filled out and were to be used for the later statistical analysis. The questionnaire used LIKERT scale items to evaluate the use of AI within critical translanguaging pedagogy and teaching and learning. The translanguaging items were based on existing translanguaging measures with a focus on the translanguaging utility scale developed. This scale consists of the utility of the content, social and language aspects of the task and uses a five-point Likert scale. Using existing translanguaging measures is justified, as recent research on the validation of instruments has been conducted and has indicated that it is useful for measuring students' translanguaging and the translanguaging educational utility.

The AI items were based on existing AI-literacy and AI in education measures, as well as instruments evaluating educators' AI integration. Building on recent scholarship and validation of measures, the author was able to define AI-integrated educational practices, and the questionnaire was adapted for the context of translanguaging, language, and literacy education. Responses were captured using a five-point Likert scale ranging from strongly disagree to strongly agree. The data were collected through the research participants from targeted educational institutions in Punjab and Sindh, Pakistan. The survey was converted into an online Google Form. Participants were sent the Google Form through available digital communication platforms, while the research participants were provided with information about the study and voluntary participation. Responses were captured automatically using Google Forms and exported into an Excel file for the analysis.

Data Analysis

After data collection, the responses obtained through Google Forms were exported to Microsoft Excel for data organization and preparation. The dataset was screened for completeness, accuracy, and consistency before being formatted and imported into IBM SPSS Statistics for further analysis.

Descriptive statistics were used to analyze the respondents and study variables. Mean and standard deviation were utilized to describe the central tendency and the response variation. The relationship of AI-supported critical translanguaging pedagogy and teaching and learning practices was analyzed using Pearson correlation. The effect of AI-supported critical translanguaging pedagogy on teaching and learning was analyzed using multiple linear regression. An independent-samples t-test was used to investigate differences between the two groups pertinent to the respondents, while one-way ANOVA was used to analyze differences when the respondent groups were three or more. Where significant differences were observed as a result of ANOVA, an appropriate post-hoc test was used to analyze the groups that showed the significant differences.

This analytical process provided a brief statistical framework for analyzing the relationships, predictor variables, and responses related to the three research objectives.

Table 1: Demographic Characteristics of Respondents (N = 379)

Variable	Category	Frequency	Percentage (%)	Respondents
Gender	Male	191	50.4	379
	Female	188	49.6	379
Age	21–30 years	104	27.4	379
	31–40 years	142	37.5	379
	41–50 years	87	23.0	379
	51 years and above	46	12.1	379
Educational Qualification	Bachelor's degree	61	16.1	379
	Master's degree	174	45.9	379
	M.Phil.	98	25.9	379
	Ph.D.	46	12.1	379
Teaching Experience	Less than 5 years	96	25.3	379
	5–10 years	139	36.7	379
	11–15 years	87	23.0	379
	More than 15 years	57	15.0	379
Institutional Sector	Public	231	60.9	379
	Private	148	39.1	379

Table 1 shows that of the 379 surveyed, 191 (50.4%) were male and 188 (49.6%) were female, indicating almost equal gender distribution. In terms of age, the largest group - 37.5% - was composed of people between 31 - 40, while 27.4% were between 21 - 30 and 23.0% were between 41 - 50. 12.1% were 51 years and above. In terms of educational attainment, most respondents had a master's degree (45.9%), while others had M.Phil. degrees (25.9%), a Ph.D. (12.1%), or a bachelor's degree (16.1%). with respect to teaching experience, 36.7% had 5 - 10 years of experience, while 25.3% had 5 years or less, 23.0% had 11 - 15 years and 15.0% had more than 15 years of experience. Finally, 231 respondents (60.9%) were from public institutions, whereas 148 (39.1%) were from private institutions, showing more representation for the public sector.

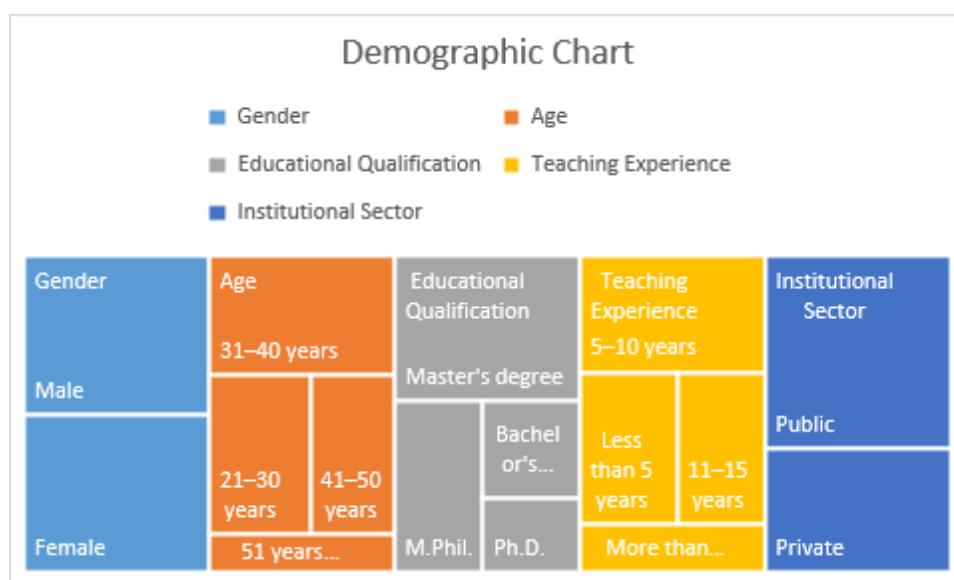
**Fig. 2 Demographic Characteristics of Respondents (N=379)**

Table 2: Reliability Statistics, Means, and Standard Deviations of Study Variables (N = 379)

Variables	No. Items	of Cronbach's (α)	Alpha Mean	Std. Deviation	Respondents
Artificial Intelligence-Supported Critical Translanguaging Pedagogy	15	.914	3.78	0.71	379
Teaching and Learning Practices	12	.902	3.84	0.68	379
Overall Scale	27	.928	3.81	0.70	379

Table 2 reports Cronbach's alpha value records at .914 for the Artificial Intelligence-Supported Critical Translanguaging Pedagogy scale, and .902 for the Teaching and Learning Practices scale. The overall reliability coefficient was .928, indicating the high internal consistency of the questionnaire items. The mean values were 3.78 and 3.84 with standard deviations recorded at 0.71 and 0.68, respectively. It shows respondents' answers recorded moderate variation. The results indicate the good measure of reliability of the measurement scales for further analysis.

Table 3: Pearson Correlation Between AI-Supported Critical Translanguaging Pedagogy and Teaching and Learning Practices (N = 379)

Variables	AI-Supported Critical Translanguaging Pedagogy	Critical Translanguaging Teaching and Learning Practices
AI-Supported Critical Translanguaging Pedagogy	1	.684**
Teaching and Learning Practices	.684**	1
Sig. (2-tailed)	—	< .001
N (Respondents)	379	379

Table 3 indicates a positive and statistically significant AI-supported critical translanguaging pedagogy and teaching and learning practices relationship, defined by a Pearson correlation coefficient of $r = .684$ and $p < .001$. In this regard, the respondents' level of AI-supported critical translanguaging pedagogy was found to correlate positively with a higher level of positive teaching and learning practices. The relationship between the two variables and the study sample shows that the correlation is positive and of a considerable extent. Therefore, in the context of the present study, the use of AI in a post-critical discourse on translanguaging pedagogy and the teaching and learning activities is confirmed.

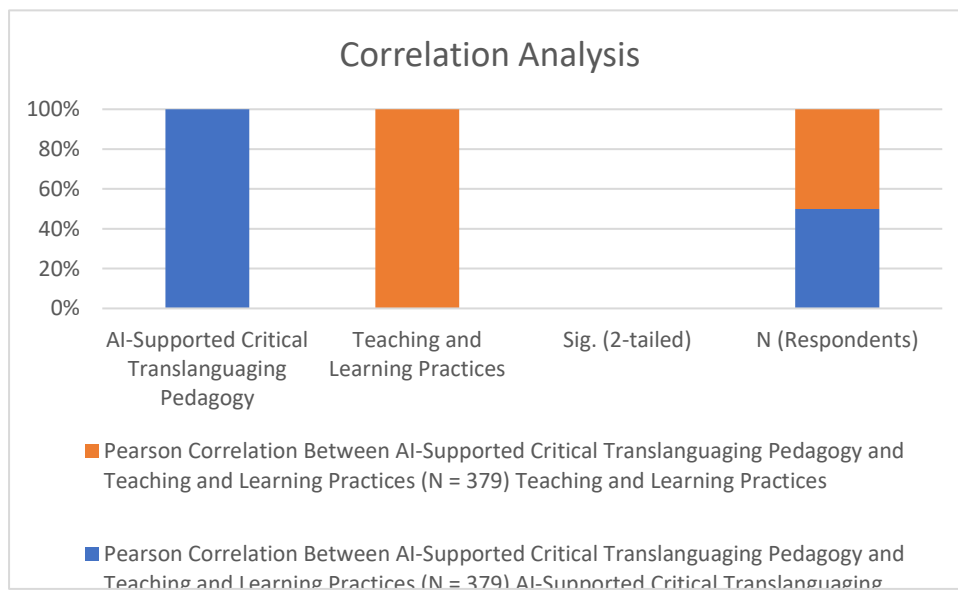
**Fig. 3 Correlation Analysis**

Table 4: Multiple Regression Analysis of AI-Supported Critical Translanguaging Pedagogy on Teaching and Learning Practices (N = 379)

Predictor Variable	B	SE	Beta (β)	t	Sig.
Constant	1.246	.184	—	6.772	< .001
AI-Supported Critical Translanguaging Pedagogy	.684	.048	.684	14.250	< .001

Model Summary

R	R ²	Adjusted R ²	F	Sig.
.684	.468	.467	203.063	< .001

Table 4 shows that AI-assisted critical translanguaging pedagogy was able to predict teaching and learning practices significantly. The regression model was statistically significant, $F(1, 377) = 203.063$, $p < .001$, with $R = .684$ and $R^2 = .468$. This suggests that the variance of teaching and learning practices explained by AI-assisted critical translanguaging pedagogy was approximately 46.8%. The predictor also showed a significant positive effect ($\beta = .684$, $t = 14.250$, $p < .001$), thus using AI-assisted critical translanguaging pedagogy increased the observed outcome of the teaching and learning practices.

Table 5: Difference in Teaching and Learning Practices by Level of AI-Supported Critical Translanguaging Pedagogy (N = 379)

Level of AI-Supported Critical Translanguaging Pedagogy	N (Respondents)	Mean	SD	t	df	Sig. (2-tailed)
Lower Level	185	3.58	0.69	-6.92	377	< .001
Higher Level	194	4.09	0.57			

Table 5 shows a statistically significant difference in teaching and learning practices based on respondent levels of AI-supported critical translanguaging pedagogy, $t(377) = -6.92$, $p < .001$. Participants with more AI-supported critical translanguaging pedagogy reported a higher average score on teaching and learning practices ($M = 4.09$, $SD = 0.57$), while respondents with less reported a mean score of ($M = 3.58$, $SD = 0.69$). This indicates more engagement with AI-supported critical translanguaging pedagogy was related to the development of more positive teaching and learning practices, where this hypothesis was confirmed.

Table 6: One-Way ANOVA of Teaching and Learning Practices by Teaching Experience (N = 379)

Teaching Experience	N (Respondents)	Mean	SD
Less than 5 years	96	3.68	0.70
5–10 years	139	3.79	0.66
11–15 years	87	3.91	0.62
More than 15 years	57	4.05	0.58

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.824	3	2.275	5.124	.002
Within Groups	166.451	375	0.444		
Total	173.275	378			

Table 6 indicates that 5.124, $p = .002$ were the results while separating participants based on their teaching experience. It was found that the mean scores for the teaching and learning practices were 3.68 for the participants with teaching experience of less than 5 years and 4.05 for the participants with more than 15 years of teaching experience. Thus, participants belonging to the higher experience group were more positive about the teaching and learning practices of AI-supported critical translanguaging pedagogy. The ANOVA result also significantly supports Hypothesis 4.

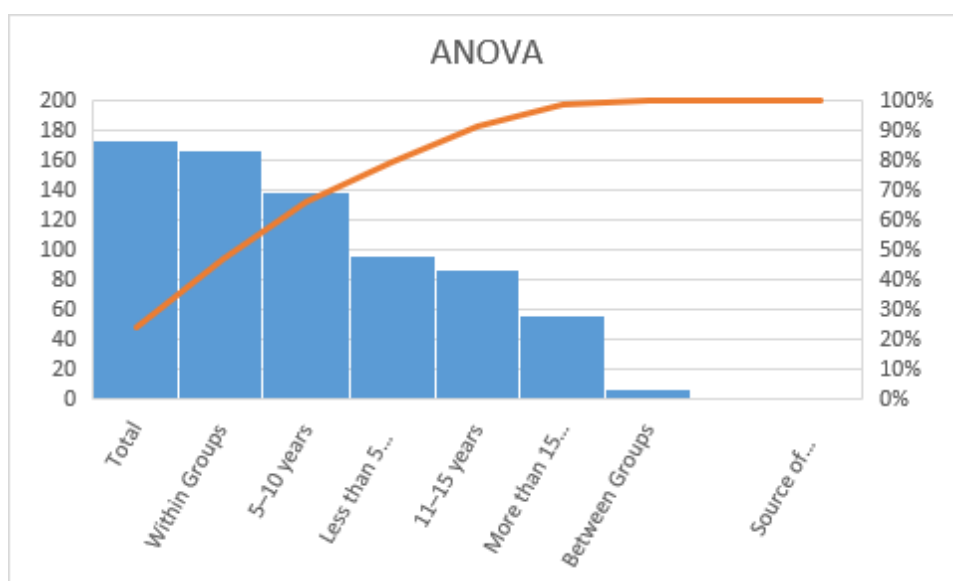


Fig. 4 Anova

Table 7: Tukey HSD Post-Hoc Comparisons of Teaching and Learning Practices by Teaching Experience (N = 379)

Comparison	Mean Difference	Std. Error	Sig.
Less than 5 years vs. 5-10 years	-0.11	0.09	.611
Less than 5 years vs. 11-15 years	-0.23	0.10	.024
Less than 5 years vs. More than 15 years	-0.37	0.11	.003
5-10 years vs. 11-15 years	-0.12	0.09	.438
5-10 years vs. More than 15 years	-0.26	0.10	.031
11-15 years vs. More than 15 years	-0.14	0.11	.418

Table 7 shows post-hoc tests for the Tukey HSD following the significant ANOVA. Results show that there are significant differences between people with less than 5 years compared to 11-15 years ($p=.024$) and less than 5 years and more than 15 years ($p=.003$), and between 5-10 years and more than 15 years ($p=.031$). The other comparisons were not significant. It can be concluded that there is a gap in teaching and learning practices among the respondents based on their years of experience. This supports Hypothesis 5.

Discussion

This research has evidenced that AI-assisted critical translanguaging pedagogy is of great importance within teaching and learning frameworks in the field of language and literacy education. The correlation analysis shows a positive, strong connection between AI-assisted critical translanguaging pedagogy and teaching and learning practices ($r = .684$, $p < .001$). It was evidenced that a greater focus on AI-supported multilingual and translanguaging practices positively impacted educational practices. This outcome corroborates (Martiningsih et al., 2026), whose meta-analysis revealed that language-learning outcomes were positively impacted by the use of AI where it provided personalized support, feedback, practice in speaking, and motivation. This research provides additional evidence in the presence of this AI regarding the critical translanguaging perspective and its use and impact within the scope of language education, where the full linguistic repertoire of the learner is engaged within the teaching and learning process.

The regression analysis showed that AI-assisted critical translanguaging pedagogy predicted teaching and learning practices ($\beta = .684$, $p < .001$) and was able to account for 46.8% of the outcome variable. This relatively strong prediction indicates that AI-supported translanguaging has the potential to go beyond simply a technological supplement to language teaching and may influence how the teaching and learning process is organized and how learners engage in educational activities (Galvao, 2027). The analysis corroborates the 2025 study that conducted a systematic review of empirical generative AI research regarding

teaching and learning practices, language-skill development, writing, and feedback in conjunction with AI. The review I read also noted that research continues to heavily concentrate in higher education and EFL settings. More work is needed in other languages and in other educational environments. More reviews focused on higher education and/or English as a Foreign Language (EFL) setting, and these settings represented a substantial part of the total reviews published. Many reviews restricted their focus to higher education settings or the use of EFL/ESL in other fields such as the business world or other non-educational fields (Al-khresheh et al., 2026).

The findings may also be explained through critical translanguaging. (Subhan et al., 2026) indicated that the use of multiple languages should not be perceived as unrestricted or automatically empowering. It needs to be analyzed in relation to the social, institutional, and ideological environments in which language practices occur. In the current study the meaningful conjunction of AI and critical translanguaging with respect to teaching and learning practices indicates that AI, in combination with empirical language/multilingual pedagogical skills, may be used to provide building blocks for the explanation, meaning, involvement, and language in the development of participants. Critical pedagogy should also be kept in mind because AI systems preference dominant languages if used without questioning linguistic inequity.

Finally, the findings may also be justified by the recent empirical studies on the merging of AI and translanguaging. A 2025 study on Generative AI in an EFL context (writing) also demonstrated that learners utilized their native language to think of and articulate ideas and subsequently defined them in English. This illustrates the ability of Generative AI to integrate itself in a multi-language environment, whereas previously it was limited to English correction and translation. (Simanjuntak, 2026) also supports that advanced forms of AI can deliver multilingual explanations, translations, teach, provide feedback, and help students draft/compose works in multiple formats. It also supports the importance of Critical Digital Literacy and points to the necessity of oversight and input from a real human. These ideas largely correlate to the present findings that augmented AI systems can support and enhance Critical Translanguaging in today's teaching and learning practices (Chheang et al., 2026).

From the independent-samples t-test, higher levels of engagement with AI-Critical Translanguaging Pedagogy led to significantly better teaching and learning practices ($M = 4.09$) than lower levels of engagement ($M = 3.58$) where the difference was statistically significant ($t = -6.92, p < .001$). It appears that higher levels of engagement with AI-based translanguaging may be beneficial to educational practices. Teachers and learners who engage with AI-based multilingual methods more may have greater access to resources to help them develop explanations and compare linguistic resources and help them elicit and build on learning ideas. This interpretation agrees with the context of other existing studies which support the use of AI-driven methods and systems in languages learning and teaching, and suggest that when teaching and learning methods are appropriately augmented with AI-driven language systems, positive impacts on learning can be realized (Aypay & Bedeker, 2025).

The ANOVA analysis indicated significant differences regarding teaching and learning practices and the number of years of teaching experience ($F(3,375) = 5.124, p = .002$). An upward trend was observed with mean scores of 3.68 by participants with less than five years of experience, and 4.05 by participants with more than fifteen years of experience. Post-hoc analysis showed significant differences, and were attributed to the less-experienced versus the more-experienced participants. The above-mentioned results show that with the integration of experience, educators are able to incorporate more advanced technologies and multilingual strategies to their teaching methods. However, some studies have also shown that the integration of experience alone is not sufficient. In 2026, a systematic pedagogical translanguaging review of EFL in the secondary levels, stated that participants engaged in higher order multilingual practices, but largely under-resourced and unsupported institutions. For these reasons, the intentional integration of AI and translanguaging by experienced and novice teachers requires professional development and institutional support.

It should be concluded that the results of the study showed that in language and literacy teaching, AI supported critical translanguaging integrates and connects emerging technologies with multilingual practices and exercises. The results generally corroborate previous research showing the positive role of AI in language learning. These results also show the importance of respecting the teaching profession and the importance of continuously using one's professional judgment. Almutairi et al. (2026) stated that critical translanguaging emphasizes language power and practices within the context of a post-foundational approach, and AI emphasizes context and language diversity.

Conclusion

The study shows how AI-integrated critically engaged translanguaging pedagogies enhance language and literacy teaching. AI-integrated critically engaged translanguaging pedagogy was shown to have a positive relationship with both teaching and

learning. Regression analysis even showed that it was a significant predictor for improvements in teaching and learning. The t-test showed a positive relationship between AI-integrated critically engaged translanguaging pedagogy and the adoption of better practices in education. This suggested that critical engagement with AI within multilingual pedagogies led to the adoption of better teaching practices. The overall findings of this study indicate that AI integrated critically with translanguaging encourages learners to be at the centre of teaching and learning through a more flexible and inclusive environment for language and literacy learning and teaching. AI integrated as multilingual frameworks, under the guidance of teachers, can help and support multilingual explanation, communication, feedback, participation and literacy. It is important to maintain balance in teaching practices when integrating AI. This means consistent critical translation of linguistic differences should be emphasized along with teaching practices, and learners should be active participants in the teaching and learning process.

Future Implications

Further research is needed in various educational contexts to better understand the effectiveness of AI-supported critical translanguaging pedagogy across different educational levels, languages, regions, and cultural settings. Future studies may adopt longitudinal or mixed-methods approaches to examine how the continued use of AI influences language and literacy development, student engagement, learning confidence, and teaching practices over time. Researchers should also explore important challenges associated with AI, including linguistic bias, unequal access to technology, privacy concerns, information accuracy, and the limited representation of minority and endangered languages. In educational settings, AI should be implemented in a responsible and ethical manner to ensure that learners can benefit from technological innovations while preserving their linguistic identities, cultural backgrounds, and active role in the learning process.

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