

Research Article

The impact of Artificial Intelligence (AI) applications on teaching quality and learner satisfaction at foreign language centers in Ho Chi Minh City

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Abstract

In the context of the strong educational digital transformation, mastering digital platforms and the application of Artificial Intelligence (AI) at foreign language centers in Vietnam, especially in Ho Chi Minh City (HCMC), is becoming an inevitable trend. Many nations globally have identified education as a top priority sector for AI application. In the United States, according to the 2024 educational technology report, 60% of teachers use AI tools in teaching management. In South Korea, since 2023, the Ministry of Education has piloted the use of AI for primary school students and recorded that 30% of students achieved effectiveness in personalization. In Vietnam, the Ministry of Education and Training is implementing two crucial projects: one involves digital transformation and AI application in teaching and learning; the second is to establish English as the second language in schools. However, quantitative studies assessing the impact of AI on teaching quality and learner satisfaction at foreign language centers in HCMC remain limited. This research will construct and propose a Structural Equation Model (SEM) to test the relationship between AI application, teaching quality, and learner satisfaction. Drawing upon the SERVQUAL theory, TAM, and international research on AI in education, the study proposes four hypotheses regarding the direct and mediating effects among the variables. The paper is expected to provide a crucial reference framework for foreign language centers in their strategy to integrate AI into teaching effectively, humanely, and sustainably.

Keywords

Artificial intelligence (AI) in education, teaching quality, learner satisfaction, foreign language centers, structural equation model (SEM), technology acceptance model (TAM), SERVQUAL/ HEDPERF, AI-integrated teaching quality model

1. Introduction

The Fourth Industrial Revolution has created a comprehensive transformation in the education sector, with AI becoming a core technology supporting teaching and learning.

According to UNESCO (2023), over 60% of countries globally have integrated AI strategies into their national education policies, indicating the critical importance of this technology

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for innovating teaching methods, management, and student assessment.

In foreign language education, which is known to be a skill demanding continuous learning capacity and daily practice, AI facilitates high-speed cognition, synthesizing knowledge to streamline the learning process, and supporting pre- and post-learning activities. Especially in English, some AI-integrated applications such as Duolingo, ELSA Speak, Grammarly, and ChatGPT have created an environment for real-time feedback, increased learner autonomy, and assisted teachers in personalizing teaching materials (Chen & Zhang, 2023). These technologies contribute to changing the teacher's role, shifting from a "knowledge transmitter" to a "learning facilitator" (Holmes et al., 2022).

In Vietnam, crucial policies have created the legal foundation to promote AI integration. Specifically in HCMC, a locale with over 1,800 licensed foreign language centers (Department of Education and Training HCMC, 2025), approximately 30-40% have begun using at least one AI application in management or English teaching. However, the level of implementation is uneven, lacking a standardized assessment framework for the effectiveness of AI use in enhancing the teaching quality and learner satisfaction. Consequently, this study aims to fill the theoretical and practical gaps by constructing an SEM model to test the impact of AI application on teaching quality and its subsequent effect on learner satisfaction within the foreign language center context.

1.1. Current status of AI application at foreign language centers in Ho Chi Minh City

This section presents preliminary survey findings on the current implementation and utilization of artificial intelligence (AI) technologies at foreign language training institutions across HCMC. The analysis focuses on three principal dimensions:

AI tools and platforms in use

The study identifies the specific AI tools and platforms that are being integrated into teaching and learning processes. The scope of investigation includes content-generation tools (e.g., ChatGPT), language checking and correction tools (e.g., Grammarly), specialized pronunciation applications (e.g., ELSA Speak), personalized learning platforms (e.g., Duolingo AI), AI-powered test-generation tools (e.g., Quizizz AI), and other proprietary AI systems developed internally by individual centers.

Extent and purpose of AI utilization

This component provides both quantitative and qualitative analyses of the penetration level and specific purposes of AI adoption within the core operational and pedagogical activities of foreign language centers. The integration of AI extends beyond simple automation, fundamentally reshaping instructional design, assessment methods, and learner management

processes.

Instructional activities (AI for teaching support)

AI is leveraged to enhance the depth, efficiency, and personalization of teaching and learning interactions, shifting the teacher's role from a primary knowledge transmitter to a "learning facilitator".

Curriculum design and material development: AI tools (such as ChatGPT, Gemini, and DeepSeek) assist instructors in rapidly creating and customizing supplementary materials, adapting existing content, and designing effective learning activities.

Personalized learning pathways: Adaptive learning systems utilize AI to continuously track student performance and style. Based on this analysis, the AI automatically adjusts the curriculum, materials, assignments, and pace to suit the individual student's proficiency level and identified knowledge gaps, thereby personalizing the learning experience. This is closely related to the function of intelligent tutoring systems (ITS).

Enhanced classroom interaction: AI provides real-time feedback during practice and supports high-speed cognition, allowing for quick synthesis of knowledge that streamlines the learning process.

Assessment and feedback (AI for grading and analytics)

AI tools significantly streamline the evaluation process and provide granular, timely feedback that is often difficult for human instructors to deliver consistently.

Automated grading: Tools like ELSA Speak and Grammarly use Natural Language Processing (NLP) to automatically score essays, open-ended assignments, and speaking tasks, providing fast and consistent assessment.

Instant feedback on linguistic skills: AI provides immediate, corrective feedback on pronunciation, grammar, and fluency, creating an environment for real-time feedback that enhances learner autonomy and skill development.

Learning performance analytics: Predictive analytics and assessment tools focus on processing large amounts of data to generate detailed reports and insights on classroom trends. This helps instructors adjust their teaching methods promptly and allows management to ensure the quality of assessment.

Learner management (AI for administrative support)

AI applications reduce the administrative burden on staff and improve the efficiency of student support services.

Student placement and tracking: AI is used to track and manage the learning progress of each student over time. Predictive analysis leverages historical data to anticipate potential issues, such as predicting the risk of dropout or failure before they occur, enabling early intervention.

Automating administrative processes: Teaching and administrative assistants (e.g., AI chatbots) are employed to automate administrative tasks and provide basic support. These Chatbots serve as virtual assistants, instantly answering

frequent student inquiries regarding schedules, rules, and administrative procedures.

Goal: The primary objective is to reduce the management burden, allowing instructors to concentrate on specialized teaching and personalized interaction with learners.

1.2 Evaluation and perceptions of AI effectiveness

The research collects data from key stakeholder groups to assess perceptions, benefits, and challenges associated with AI implementation:

Teachers: The survey explores teachers' readiness to integrate AI, perceived advantages (e.g., reduced workload, enhanced personalization), and challenges (e.g., limited digital skills, ethical concerns, reliability issues).

Learners: Learners' satisfaction levels and perceived effectiveness of AI-enhanced learning are examined.

Center Administrators: Insights are gathered on managerial benefits (e.g., cost optimization, improved service quality) and implementation barriers (e.g., financial investment, technological infrastructure constraints).

1.3 Practical Issues in HCMC

Although AI offers numerous evident benefits such as reducing the time required for lesson preparation, facilitating prompt learner feedback, and providing personalized learning pathways. It also gives rise to several challenges:

Lack of evaluation standards: There is no established set of indicators for measuring teaching quality in AI-supported learning environments. **Risk of technological dependence:** Teachers may become overly reliant on AI tools, potentially diminishing creativity and direct interaction with learners. **Digital competency gap:** Disparities exist between large and small language centers, as well as between younger teachers and their more senior counterparts. **Unclear impact on learner satisfaction:** While some learners appreciate AI-enhanced experiences, others report feeling a loss of emotional connection with instructors (Holmes et al., 2022).

Consequently, examining the impact of AI on teaching quality is essential for enabling foreign language centers in HCMC to develop effective application strategies that not only enhance instructional quality and innovate management models, but also preserve the humanistic values of education.

2. Overview of related studies

2.1. Domestic Studies

In recent years, various Vietnamese studies have examined the application of AI in education in general and in foreign

language teaching in particular. Some representative studies include:

Table 1. Representative studies

Authors (Year)	Key Focus / Findings
Bui T., & Nguyen M.T. (2024)	- Primary focus: The application of AI in higher education and its specific impact on students. - The research trend centers on investigating how AI influences students' actual learning processes. - The study discusses students' perceptions of AI, the tools they use (e.g., ChatGPT, Grammarly), and both the positive effects (personalization, research support) and negative effects (technological dependence, ethical concerns) of AI on learning outcomes and learning methods.
Dinh T.M.H., & Tran V.H (2021)	- Primary focus: An overview of AI in higher education. - Provides a comprehensive perspective on the opportunities AI brings to the university environment. - Opportunities: Enhanced teaching quality (personalization, intelligent learning systems), automation of administrative tasks, and the emergence of new learning approaches. - Challenges: The evolving role of lecturers, ethical and data security issues, the need for adequate technological infrastructure and high-quality data, and unequal access to technology.
Le T.N.H., & Nguyen L.T.T. (2025)	- Primary focus: The application of AI in foreign language teaching at the high school level in Da Nang City. - Conducts on-site empirical research assessing: - Current conditions: Levels of use, awareness, and attitudes of high school teachers and students toward AI tools (e.g., pronunciation training, translation, writing support). - Potentials: Proposed strategies to more effectively leverage AI to enhance foreign language learning outcomes at the secondary level.
Trieu T.T. (2025)	- Primary focus: An overview of AI in foreign language education and training in Vietnam. - Provides a strategic perspective on the impact of AI on language education. - Opportunities: AI assists in personalized

	learning pathways, improves communication skills (via chatbots and speech recognition), and enables flexible lesson content creation. • Challenges: Limitations in AI's handling of Vietnamese culture/semantics, lack of high-quality Vietnamese language corpora, and disparities in technological infrastructure across regions.
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In summary, domestic studies thus far primarily describe phenomena or examine the use of specific AI tools, often focusing on individual language skills (listening, speaking, reading and writing). However, there remains a lack of systematic, quantitative studies evaluating the overall impact of AI on teaching quality and learner satisfaction within foreign language centers.

2.2. International Studies

Internationally, numerous organizations and scholars have conducted extensive research on AI applications in education. Notable works include:

- Holmes, W., Bialik, M., & Fadel, C. (2022). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*.

This global synthesis examines the role of AI in education, emphasizing the potential of “AI as a co-teacher” to personalize learning, while also warning of risks such as technological dependence and imbalance between pedagogical competence and technological capability.

- Luckin, R. et al. (2023). *AI and Education: Guidance for Policy Makers*. OECD Publishing.

Provides a comprehensive policy framework for implementing AI in education, emphasizing the importance of teacher training in digital pedagogical competencies and the assessment of AI's impact on teaching quality.

- Chen & Zhang (2023). *AI-enhanced English teaching and students' learning motivation in China*. *Computers & Education*, 190, 104682.

This empirical study in China finds that the integration of AI into English language instruction enhances learners' motivation, improves the immediacy of feedback, and enriches overall learning experiences.

Nevertheless, most international studies are conducted within public schools or higher education contexts. Limited attention has been given to foreign language centers, which possess distinct characteristics in terms of governance models, instructional approaches, and learner demographics.

2.3. Research Gap

Although both domestic and international studies have explored the application of AI in education, several significant gaps remain. First, existing Vietnamese research largely

concentrates on describing current AI usage or analyzing specific tools in isolated language skills, without employing systematic quantitative models to assess AI's overall influence on teaching quality and learner satisfaction. Second, international studies, while extensive, primarily focus on public educational institutions or universities, where governance structures, technological readiness, and learner profiles differ substantially from those of foreign language centers. Third, very few studies investigate the mediating role of teaching quality in the relationship between AI adoption and learner satisfaction—an essential mechanism for understanding how AI can generate meaningful educational value. Finally, the literature lacks a contextualized AI governance framework tailored to the operational realities of foreign language centers in Vietnam, particularly in Ho Chi Minh City, where competition, market-driven learning demands, and diverse learner segments require nuanced management strategies. Therefore, a comprehensive, SEM-based analysis that examines AI applications, teaching quality, and learner satisfaction within foreign language centers is not only timely but also necessary to fill the current research gaps.

3. Theoretical framework

3.1. Service quality models in education

Teaching quality in the research context is developed from two main models:

The SERVQUAL (Service Quality) Model (Parasuraman, Zeithaml, & Berry, 1988) assesses service quality by the gap between the customer's expectations and their perceptions of the service delivered. SERVQUAL includes five components: reliability, responsiveness, assurance, empathy, and tangibles.

SERVQUAL consists of five independent observable dimensions that reflect the essential aspects of service quality:

Table 2. Aspects of service quality

No	Component	Description
1	Reliability	The ability to perform the promised service dependably, accurately, and consistently.
2	Responsiveness	The willingness to assist customers and provide prompt, timely service.
3	Assurance	The knowledge, professional competence, courtesy, and trustworthiness demonstrated by service personnel.

4	Empathy	The provision of individualized attention and personalized care to each customer.
5	Tangibles	The physical facilities, equipment, appearance of personnel, and other visible, material aspects of the service environment.

The HEdPERF (Higher Education Performance) model was developed by Abdullah (2005): specifically to address the limitations of the SERVQUAL model when applied in the unique context of Higher Education.

The HEdPERF model deviates fundamentally from SERVQUAL's "gap" methodology:

Performance-only measurement: HEdPERF focuses solely on measuring perception of performance. This approach eliminates the "expectation" component inherent in SERVQUAL's gap analysis. **Rationale:** The model argues that customers (students) often harbor excessively high or unrealistic expectations, which renders the resulting measurement of the expectation-perception gap (GAP) inaccurate. Therefore, the assessment of service quality should concentrate strictly on the level of execution achieved by the educational institution.

Components supplementing traditional models

While retaining the essence of measuring service quality, HEdPERF enhances the framework by incorporating factors specifically critical to the academic environment, which were often inadequately captured by the five dimensions of SERVQUAL.

HEdPERF supplements the model with these distinct, education-specific factors:

Teaching quality (academic quality): Pertains to the quality of the core academic delivery, including the competence of the instructors, the relevance of the curriculum, and the effectiveness of pedagogical methods. **Reputation:** The standing and prestige of the educational institution within the community and the academic world. **Support services (non-academic quality):** Relates to the quality of auxiliary services essential for student life and success, such as libraries, IT facilities, career counseling, and administrative support. By incorporating these specialized factors, HEdPERF offers a more comprehensive and contextually valid instrument for measuring and managing service quality within the higher education sector.

In the AI context, these components need to be expanded with new factors such as: the extent of lesson personalization, the effectiveness of AI feedback, the level of assessment automation, and AI support for lesson preparation and classroom administration.

3.2. Technology acceptance model (TAM)

TAM (Davis, 1989) is a core theory built upon the Theory of Reasoned Action (TRA), aiming to explain and predict the

actual system use of a new technology. TAM emphasizes two factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).

Table 3. Technology acceptance model

TAM factor	Impact on teachers (Teaching)	Impact on learners (Learning)
Perceived Usefulness (PU)	Personalizes the curriculum, reduces administrative workload, enhance the quality of lessons and student performance.	Increases the speed of information retrieval, provides instant feedback, 24/7 learning support, and improves learning outcomes.
Perceived Ease of Use (PEOU)	AI interface is simple, easily integrated into existing systems, and requires no in-depth specialized training.	AI tools are easily accessible, simple to operate for input and result retrieval.

3.3. Development of research hypotheses

Based on the theoretical foundation, the paper proposes four hypotheses:

H1: AI application positively affects teaching quality.

H2: AI application positively affects the quality of feedback and assessment.

H3: Teaching quality positively affects learner satisfaction.

H4: Teaching quality plays a mediating role between AI application and learner satisfaction.

4. Research Model

Based on the proposed hypotheses, the research model is illustrated as follows:



Figure 1. The research model

Variables in the research model

The research model is constructed upon the causal relationships among three main types of variables, which are defined and operationalized as follows:

4.1. Independent variable: AI application

The independent variable measures the extent and manner in which AI technologies are integrated into the core operational and instructional processes of foreign language centers. This construct consists of three specific dimensions:

AI-supported lesson preparation and content development: The degree to which AI is utilized to create, modify, and personalize learning materials and to design curricula.

AI-supported feedback and assessment: The extent to which AI is employed for automated grading, instant feedback provision, and analysis of learner performance.

AI-supported interaction and classroom management: The level of AI deployment to enhance classroom interaction, support administrative management, and maintain instructional discipline.

4.2. Mediating variable: Teaching quality

The mediating variable reflects the overall quality of instructional practices, which is influenced by the independent variable and, in turn, affects the dependent variable. Teaching quality is measured through the following dimensions:

Lesson preparation: The completeness, coherence, and appropriateness of instructional materials and lesson plans.

Teaching methods: The effectiveness, creativity, and diversity of pedagogical techniques employed during instruction.

Interaction: The extent to which teachers encourage and sustain active participation between instructors and learners throughout the learning process.

Feedback: The timeliness, accuracy, and constructiveness of feedback provided by teachers to learners.

4.3. Dependent variable: Learner satisfaction

The dependent variable represents the outcome of the model, capturing learners' perceptions and positive attitudes toward their overall educational experience. Learner satisfaction is defined through:

Perceived learning effectiveness: Learners' perceptions of their progress and achievement of learning goals.

Content relevance: Perceived usefulness, applicability, and alignment of the learning content with learners' personal needs.

Teacher support: Learners' evaluation of teachers' dedication, enthusiasm, and ability to provide personalized support.

5. Research Methodology

The study will adopt a mixed-methods approach, integrating qualitative and quantitative data collection and analysis across two sequential stages to comprehensively investigate the impact of AI applications on teaching quality and learner satisfaction at foreign language centers in HCMC.

The study will use mixed-methods in two stages:

5.1. Qualitative stage

This initial stage serves an exploratory function to refine the theoretical constructs and ensure the quantitative instrument's contextual validity.

Methodology: In-depth interviews will be conducted.

Sample: A purposeful sample of 10 experts will be selected, comprising center directors, lecturers, and EdTech specialists.

Purpose: The findings from these interviews will be used to adjust the measurement scales and incorporate context-specific factors that are salient to the operation and pedagogy within foreign language centers in the HCMC context. This ensures the model accurately reflects local realities, particularly concerning AI acceptance and utilization.

5.2. Quantitative stage

This stage aims to collect data necessary for statistical modeling and hypothesis testing, specifically using a SEM.

Sampling and data collection

Target Population: The study targets the vast landscape of foreign language centers in HCMC. As a large locale with over 1,800 licensed foreign language centers, HCMC provides a rich environment for data collection.

Sampling Method: Convenience sampling will be employed.

Sample size and distribution: The target sample size is 400 individuals, distributed across three key stakeholder groups: 50 managers, 150 lecturers, and 200 learners.

Survey scope: Data will be collected from 20 foreign language centers offering diverse English courses, including those for primary and secondary students and international certificate preparation. This ensures variability across student age groups and program types, enhancing the generalizability of the findings within the foreign language sector.

SEM requirement: The chosen sample size of 400 satisfies the SEM requirement, which stipulates a minimum sample size of $N \geq 10-15$ times the number of observed variables.

Data analysis procedure

The collected quantitative data will be analyzed using a multi-step procedure to ensure the reliability of the scales and the validity of the hypothesized structural relationships.

Software: SPSS 26 and AMOS 24 will be utilized for statistical analysis.

Scale assessment

Prior to structural modeling, the reliability and validity of the measurement instrument will be rigorously assessed.

Reliability: Tested using Cronbach's Alpha.

Validity (Factor Structure): Assessed via Confirmatory Factor Analysis (CFA).

Convergent and Discriminant Validity: Evaluated using the Average Variance Extracted (AVE) and Composite Reliability (CR) metrics.

Structural model testing

The core relationships proposed by the research hypotheses (H1 to H4) will be tested.

Method: Structural Equation Modeling (SEM) will be utilized.

Function: SEM is essential for simultaneously testing multiple dependent and independent relationships, particularly the complex mediating role hypothesized for teaching quality between AI application and learner satisfaction.

Model fit evaluation

The final step involves assessing how well the proposed theoretical model aligns with the empirical data. Key indices: model fit will be evaluated using standard goodness-of-fit indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the Chi-square.

6. Expected Results

6.1. Level of AI Application at foreign language centers in HCMC

The research expects to describe three main AI categories:

- AI teaching support: ChatGPT, Gemini, DeepSeek, Duolingo.
- AI feedback/assessment: ELSA Speak, Grammarly, automated scoring systems.
- AI-powered learning management tools: Divided into three types:

Adaptive learning systems: Focus on personalizing the learning experience. Functions include performance analysis, content adjustment, and instant support, often associated with Intelligent Tutoring Systems (ITS) (Graesser et al., 2005).

Predictive analytics and assessment tools: Key functions include predictive analysis (e.g., predicting dropout risk), automated scoring and feedback (Roll & Wylie, 2016), and learning analytics.

Teaching and administrative assistants: Focus on automating administrative tasks. Functions include chatbot support (Hew et al., 2022) and content generation.

6.2. Hypothesis testing

H1 and H2 are expected to be supported: AI helps increase

lesson preparation efficiency, diversify teaching methods, and personalize learning.

H3: Teaching quality is the primary factor influencing satisfaction.

H4: Teaching quality holds a crucial mediating role in the AI impact mechanism.

7. Proposed AI-integrated governance model

The AI-integrated teaching quality model provides a comprehensive framework for assessing and enhancing teaching quality when AI is integrated.

7.1. Teacher digital competency

This is the most critical foundation.

Definition: The totality of knowledge, skills, and attitudes necessary to use digital technology and AI in a safe, responsible, and effective manner.

Detailed aspects: Technical proficiency, digital pedagogy, AI evaluation and selection, and ethical and legal awareness (including AI bias and data privacy).

7.2. Technology infrastructure

Infrastructure must ensure AI tools run smoothly and equitably.

Core requirements: Stable internet connectivity, adequate equipment, LMS capable of seamlessly integrating APIs (interoperability), and strong data security protocols.

7.3. Learning data governance process

This process ensures the accuracy, security, and ethics of the large amount of learning data generated by AI.

Detailed rules: Collection and storage rules, privacy and consent, data auditing (to check for AI bias), and clearly defined access rights.

7.4. AI ethics rules

The model must be based on international ethical principles, typically the OECD AI principles.

Core Principles: Accountability, transparency and explainability, fairness and inclusiveness, and safety and security.

7.5. Framework for assessing AI impact on quality and learning experience

This is a continuous feedback mechanism to measure AI's

actual effectiveness.

Objective: Measuring whether AI truly improves teaching quality and the learning experience.

Measurement Indicators: Include metrics for teaching quality (e.g., personalization level), learning outcomes (e.g., score improvement, failure rate reduction), and learning experience (e.g., student satisfaction).

8. Discussion

The research will make several key contributions.

The study is positioned at the intersection of educational quality assessment and technological integration, seeking to provide empirically grounded insights into the adoption of AI in the burgeoning foreign language education sector of HCMC. The research is designed to yield several key theoretical and practical contributions:

Expansion of quality assessment models in digital contexts

The research will directly contribute to the service quality literature by expanding existing quality assessment models, specifically SERVQUAL and HEDPERF, within the context of digital transformation.

Bridging the gap: Traditional models often lack the necessary factors to capture the nuances of technology-mediated services. This study extends these frameworks by incorporating AI-specific dimensions, such as the effectiveness of automated feedback, the degree of lesson personalization, and the reliability of AI-driven tools.

Contextual validation: By integrating these novel factors, the research will provide a refined and contemporary instrument for measuring service quality that is specifically tailored to the characteristics of the AI-integrated language education sector.

Clarification of the AI to satisfaction mechanism

A central contribution of the research lies in clarifying the mechanism through which AI influences teaching quality and, consequently, learner satisfaction.

Mediating role: Through the application of SEM, the study aims to empirically confirm the mediating role of teaching quality which includes the quality of instruction, assessment, and feedback. The confirmation of this mediation effect would provide robust evidence that the benefits of AI such as personalization and automation do not directly increase learner satisfaction but rather do so indirectly by first raising the perceived quality of teaching.

Causal insight: This finding provides critical causal insight for administrators, indicating that investment in AI should be strategically directed toward tools that demonstrably empower instructors and enhance pedagogy, rather than merely focusing on cost-saving automation.

Proposal of an AI governance framework

The research will transition from empirical findings to strategic recommendations by proposing an AI governance framework that will be suitable for foreign language centers in HCMC.

AI-Integrated teaching quality model: This proposed framework will synthesize the empirical findings confirming the relationships between AI application and teaching quality with normative best practices concerning AI deployment (OECD, 2023).

Focus on sustainability and ethics: The framework will address practical and ethical requirements, including standards for teacher digital competency and protocols for learning data governance, ensuring that the integration of AI is not only effective but also human-centered, ethical, and sustainable in the long term.

9. Conclusion

This research concludes by summarizing the study's objectives, confirming its methodological rigor, outlining its expected scientific contributions, and acknowledging potential limitations.

The study rigorously examines the potential of AI to enhance teaching quality and the learning experience at foreign language centers in HCMC.

Empirical validation: By employing a SEM and a mixed-methods design, the study provides scientific evidence regarding the mediating role of teaching quality. This confirms that the benefits of AI application affect learner satisfaction indirectly through the improvement of instructional delivery.

Practical framework: The research proposes an AI-integrated governance model oriented toward humaneness and sustainability. This framework details crucial administrative factors, including teacher digital competency, Technology infrastructure, and learning data governance process.

Strategic recommendations: The resulting recommendations focus on effective AI implementation, specifically addressing how to integrate AI into the curriculum while simultaneously safeguarding critical thinking and creativity, and navigating the complex ethical dimensions of AI use in the teaching and learning process.

Limitations and future research directions :

While the study design to provide comprehensive insights, potential limitations must be acknowledged:

Sampling method: The use of convenience sampling across a limited number of centers 20 out of over 1,800 in HCMC may restrict the generalizability of the quantitative findings to the entire foreign language education sector in the city.

Cross-sectional data: If the SEM is based on cross-sectional data, it can only infer, but not definitively prove, the longitudinal effects and causal mechanism of AI on teaching quality

over time.

Scope of AI tools: The study is limited to the types of AI tools currently prevalent in foreign language centers (e.g., Duolingo, ELSA Speak, Grammarly, ChatGPT). Rapid technological advancements may introduce newer AI models that require subsequent investigation.

Ethical complexity: The study's governance proposal addresses the OECD AI principles, but the real-world implementation of complex rules, such as balancing data auditing for bias with data privacy for learners, will require further refinement and validation through pilot studies.

Future research should focus on longitudinal studies to track the sustained impact of AI integration and should seek to replicate the model using probability sampling methods to enhance external validity.

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