

APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN TEACHING, LEARNING, AND ASSESSMENT OF FOREIGN LANGUAGES IN HIGHER EDUCATION INSTITUTIONS IN VIETNAM

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Abstract: In the context of globalization trends and the strong development of artificial intelligence (A.I.) technology, the application of A.I. in higher education in Vietnam is emerging as a groundbreaking new trend, particularly in teaching, learning, and assessment of foreign languages. It is well known that A.I. can personalize the learning process, optimize teaching quality, and enhance students' learning experience. However, implementing A.I. also faces high costs, complex technical requirements, teacher and student resistance, and security and privacy issues. This research focuses on exploring the role of A.I. in improving the quality of foreign language education, thereby proposing specific A.I. applications. The study includes an analysis of A.I. concepts and components, the history of A.I. development, current A.I. trends in education, and A.I. applications in this field. By analyzing the benefits and challenges, the research also provides solutions to optimize the application of A.I. technology in foreign language education at today's higher education institutions in Vietnam.

Keywords: Artificial Intelligence (A.I.); Foreign language education; Higher education vietnam; Educational technology; Language assessment

1 INTRODUCTION

Technology is revolutionizing modern education by overcoming barriers of space and time, allowing learners to access online learning resources from anywhere and at any time. Online learning platforms and virtual reality provide rich and realistic learning experiences, helping students grasp knowledge and develop skills vividly and effectively.

Technology in education also fosters teamwork skills, creating opportunities for students to engage in online collaborative projects and enhancing their organizational abilities and critical thinking. For instance, millions of students worldwide have used Google Workspace as an Education tool for group work and remote collaborative projects, helping them develop collaboration and project management skills.

Artificial intelligence (A.I.) now plays a crucial role in personalizing learning paths, analyzing learning data, and providing instant feedback, allowing students to progress at their own pace and learning style. A digitized learning environment encourages creativity and autonomy, enabling students to experiment and develop ideas in a positive and innovative learning space.

It is evident that technology enhances the quality of teaching and learning in modern education and equips students with the necessary skills to succeed in an increasingly digital world.

In the context of the rapidly developing Fourth Industrial Revolution, technology in education has become a critical factor in improving the quality of teaching and learning in Vietnam. Technology helps enhance the effectiveness of knowledge transmission and equips the younger generation with the skills to face new challenges in modern society.

Information Technology (I.T.) has been transforming how we access and process information. The concept of "literacy" today encompasses the ability to read and comprehend texts and access and use technology [1]. This requires teachers to possess technological skills to convey knowledge effectively and creatively.

On August 23, 2023, the Minister of Education and Training of Vietnam signed Decision No. 2457, issuing the plan for key tasks and solutions for the 2023-2024 academic year. Under the theme "Solidarity, Discipline, Creativity, Continuing Innovation, Enhancing the Quality of Education and Training", the 2023-2024 academic year focuses on 12 key tasks and solutions, including "Promoting digital transformation and administrative reform across the entire sector" with a key solution being: enhancing digital transformation and the application of I.T. in management, teaching, and assessment. Simultaneously, the Ministry of Education and Training of Vietnam also encourages developing and exploiting big data and appropriate artificial intelligence solutions in education and training. This is an important task to improve education quality and meet society's increasing demands in the context of digital transformation.

According to the Prime Minister's decision in 2020 approving the "National Digital Transformation Program until 2025, with orientation to 2030", the entire sector must also promote the implementation of the National Digital Transformation Program. In this regard, the Ministry of Education and Training needs to strengthen the review, construction, and supplementation of the legal framework and develop guiding documents and directives to promote the

application of I.T. and online education. Furthermore, collaborating with higher education institutions to build a national database on higher education is also an important part of this program.

Currently, I.T. has become an indispensable tool and learning environment in education. The application of technology in education improves the quality of teaching and learning and helps teachers innovate teaching methods to meet the demands of digital education. To achieve this, teachers need to be trained and equipped with I.T. and A.I. skills, enabling them to perform their teaching duties effectively in the modern context. By mastering technology, teachers will be able to fulfil their tasks and meet the new requirements of the education sector [2].

2 PAPER AND TEXT FORMAT

2.1 Definition and Role of A.I. in Language Education

The term “Artificial Intelligence” (A.I.) was first introduced in the 1950s, marking the birth of a new field of technical science in the computer technology industry. In computer science, A.I. is often used to describe computers or automated systems capable of performing intelligent functions, including learning from data, simulating, and solving complex problems.

Artificial Intelligence in Education (AIED) refers to the application of artificial intelligence technologies in education to enhance the quality and efficiency of the teaching and learning process. AIED aims to create personalized learning experiences and support educators in teaching and classroom management more effectively.

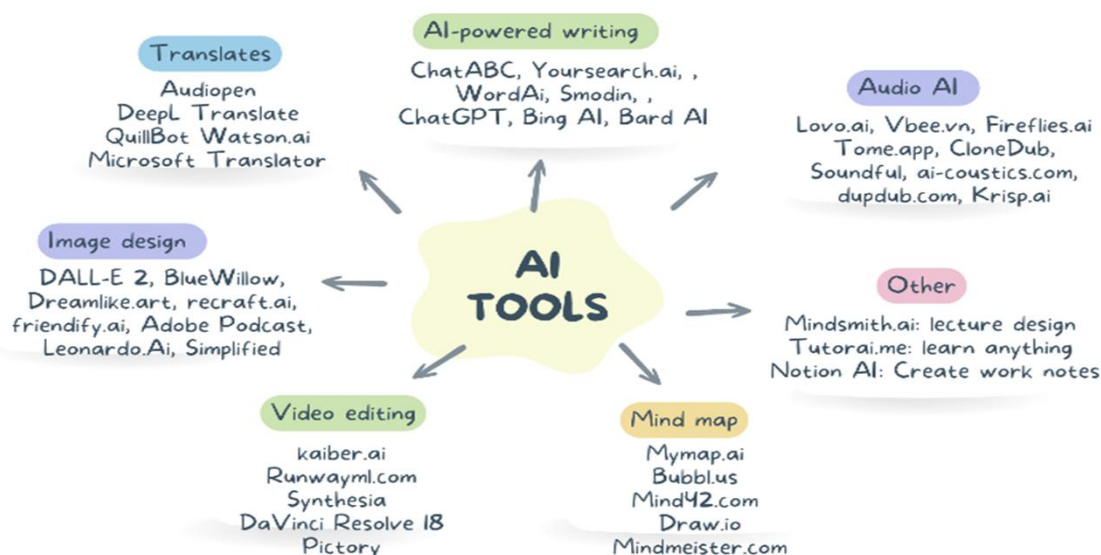


Figure 1 A.I. tools in teaching, learning, testing and evaluating foreign languages

The application of artificial intelligence in foreign language education is becoming increasingly crucial in optimizing the teaching and learning process and evaluating students' learning outcomes. It not only helps create intelligent learning systems but also supports the analysis and personalization of the teaching process based on the specific needs of each student. Here are some critical roles of A.I. in teaching, learning, and assessing foreign languages:

As an Intelligent Learning System

A.I. uses advanced technologies such as machine learning, data mining, natural language processing, and computer vision to develop intelligent learning systems. These systems can automatically analyze students' learning outcomes and suggest appropriate improvement outcomes.

AIED sy can accurately assess students' learning

processes by analyzing data and applying A.I. technology. This enables instructors and learners to receive quick and detailed feedback, thereby improving learning efficiency.

Providing Customized Educational Content

A.I. delivers personalized educational content based on the specific learning needs of each student. This enhances interaction and learning efficiency in the foreign language learning process.

2.2 Objectives and Scope of the Study

Objectives of the Study: This research explores the role of Artificial Intelligence (A.I.) in teaching, learning, and assessing foreign languages at higher education institutions in Vietnam. The study will analyze specific applications of A.I. to propose several directions in which A.I. technology can be integrated into the teaching, learning, and assessing

of foreign languages to improve the quality of foreign language education for Vietnamese students in particular and the language learning community in general.

Scope of the Study: This research focuses on higher education institutions in Vietnam, where A.I. can be maximally applied to optimize foreign language teaching and learning. Based on the scope of the study, we will analyze and identify the challenges and opportunities that A.I. application brings to the foreign language education sector in Vietnam and higher education in general.

2.3 Research Methodology

2.3.1. Literature analysis method

Focus on collecting and analyzing research documents and reports from reliable sources regarding A.I. applications in foreign language education.

Use scientific literature, books, and previous studies to provide theoretical and practical context for A.I. applications in education.

Analyze research results, implemented models, and practical comparisons on the effectiveness of A.I. in teaching, learning, and assessing foreign languages.

2.3.2. Data collection and analysis from reliable sources

Collect data from higher education institutions and experts in foreign language education to better understand the current situation and practical needs of applying A.I. technology in teaching, learning, and assessing foreign languages in Vietnam.

Analyze the collected data to evaluate current trends and challenges in applying A.I. to foreign language teaching and learning.

Propose specific solutions and recommendations to optimize the use of A.I. in the higher education environment in Vietnam.

2.4 Overview of A.I. in Foreign Language Education

2.4.1 Concepts and components of A.I.

Basic concepts and components of artificial intelligence (A.I.):

The definition of A.I. defines it as the automation of tasks using autonomous mechanical and electronic devices equipped with intelligent control capabilities [3]. A.I. is not one thing but an umbrella term for a growing set of modelling capabilities . A.I. is classified into three main types: Artificial Narrow Intelligence (ANI), currently applied in tasks such as language translation and weather forecasting; Artificial General Intelligence (A.G.I.), envisioned as a future capability to solve complex problems autonomously; and Artificial Superintelligence (A.S.I.), a theoretical A.I. exceeding human capabilities across various domains [4]. As seen in Figure 2, the primary subfields of A.I. encompassing machine learning, knowledge-based systems, computer vision, robotics, natural language processing, automated planning and scheduling, and optimization are all pivotal in A.I. development (O'Brien, W.J. Fiatch, 2017). A. I. is not one thing but an umbrella term for a growing set of modelling capabilities .



Figure 2 Components, types, and subfields of A.I., derived from [5]

Standard Algorithms and Techniques in A.I.: Artificial intelligence (A.I.) uses various algorithms and techniques to solve complex problems and improve performance. Below are some standard algorithms and techniques:

- 1) **Machine Learning:** Supervised Learning, Unsupervised Learning, Reinforcement Learning, Deep Learning.

- 2) **Artificial Neural Networks - ANN:** Deep Neural Networks – D.N.N., Convolutional Neural Networks – CNN, Recurrent Neural Networks - R.N.N.
- 3) **Knowledge-Based Systems:** Expert Systems, Case-Based Reasoning, Linked Systems, Intelligence Agents.
- 4) **Natural Language Processing - N.L.P.:** Language Models, Sentiment Analysis, Speech Recognition.
- 5) **Optimization:** Genetic Algorithms, Particle Swarm Optimization, Evolutionary Algorithms, Differential Evolution.
- 6) **Computer Vision:** Object Detection and Recognition, Image Segmentation.
- 7) **Automated Planning and Scheduling:** Automated Planning, Automated Scheduling.

These algorithms and techniques form the foundation for the development of A.I. and are widely applied in various fields, ranging from education, healthcare, and finance to industrial automation[6-7].

2.4.2 Development history and current trends of A.I. in education

Development History of A.I. in Education: The concept of "Artificial Intelligence" was first introduced by John McCarthy in 1956, marking the beginning of a new scientific field. Initially, A.I. research focused on simulating aspects of human intelligence and learning, aiming to create systems and machines capable of learning and processing information similarly to humans.

In the 1950s and 1960s, scientists began developing simple algorithms to solve fundamental problems, paving the way for significant advancements in A.I. development. By the 1970s and 1980s, A.I. had become an official field of study, involving many scientists and governments worldwide. The first A.I. applications in education appeared in chess systems and interactive teaching programs. Artificial Intelligence in Education (AIEd) emerged around the 1970s [8], focusing on researching, developing, and evaluating computer software to enhance teaching and learning. The long-term goal of AIEd is to gather learner feedback, assess abilities and weaknesses, personalize learning for individuals or groups, and use A.I. techniques to develop teaching and learning theories [9].

In the 1990s, the explosion of the Internet spurred the development of A.I., focusing on machine learning and related algorithms. In recent years, A.I. has become a rapidly developing field with significant advancements in educational applications. Modern A.I. systems can collect feedback from learners, assess abilities, and personalize the learning process. This technology has helped improve teaching and learning efficiency, providing better learning experiences for students.

2.4.3 Current and future trends of A.I. in foreign language education

Current Trends: A.I. is widely applied in various fields, from healthcare to finance, manufacturing, and education. In foreign language education, Intelligent Tutoring Systems (ITS) uses A.I. to provide personalized lessons and exercises, helping students grasp knowledge more effectively. Language learning applications such as Duolingo, Rosetta Stone, and Babbel use A.I. to analyze and adjust learning content based on each learner's progress and abilities. A.I. is also used to create virtual assistants, helping students practice languages through natural communication. These assistants can understand and respond to natural language, helping students improve their listening, speaking, reading, and writing skills. Additionally, A.I. assists teachers in assessment and grading, reducing workload and increasing accuracy.

Future Trends: With AI's development, concerns about its impact on society and humans exist. One of the main concerns is replacing humans in traditional jobs, leading to unemployment for low-skilled workers. Cybersecurity concerns exist, mainly when A.I. systems are used in sensitive fields like finance and the military.

However, these issues are being addressed with technological advancements and efforts from the A.I. research community. Researchers and governments are working to ensure that the development of A.I. benefits people and society. According to Björn Sjöden, technology should not be used to model human characteristics perfectly, such as communication abilities or intelligence, but only enough to evoke social schemas that engage students in effective learning interactions. "In the near future, we may not see the widespread appearance of 'robot teachers' completely replacing the role of human teachers, but by researching and implementing products using 'machine intelligence' as we do now, the teaching and learning process has already begun to see positive changes." [10].

In the future, A.I. is expected to continue developing and expanding its applications in foreign language education. Advanced technologies such as Conversational A.I. will be used to create more interactive and realistic teaching models. Virtual Reality (V.R.) and Augmented Reality (A.R.) combined with A.I. will bring dynamic and engaging learning experiences. It is essential to ensure that the development of A.I. goes hand in hand with the development of humans and society, ensuring safety and progress for the entire world.

2.4.4 Global applications of A.I. in language education

Applications of A.I. in Foreign Language Education Worldwide: Applications of A.I. in Foreign Language Education Worldwide Artificial Intelligence (A.I.) is increasingly significantly enhancing teaching and learning processes in foreign languages, especially in higher education institutions. A.I. technologies offer valuable solutions that improve teaching and learning efficiency, creating rich and personalized learning experiences. Here are some critical applications of A.I. in foreign language education:

- 1) **Intelligent Tutoring System - ITS:** Language learning platforms like Duolingo use A.I. to customize learning paths for individuals. These systems can adjust lessons based on learners' progress and abilities, providing instant feedback on grammar and pronunciation. This optimizes the learning process and ensures that each learner progresses uniquely.
- 2) **Natural Language Processing (N.L.P.):** N.L.P. technology is widely used in applications like Grammarly, assisting learners in checking and improving grammar, spelling, and writing style. This is particularly useful for writing essays, assignments, and emails, effectively enhancing writing skills.

- 3) **Learning Analytics:** Educational platforms like Coursera track learners' progress and performance using learning analytics. A.I. technology helps identify learners' difficulties and suggests timely support measures, thereby improving the quality of teaching and learning.
- 4) **Computer Vision:** Computer Vision is applied in applications like Kahoot! to recognize and analyze students' facial expressions during online classes. This helps teachers assess students' attention and interest levels, allowing them to adjust teaching methods accordingly.
- 5) **Customized Learning Content:** Applications like Quizlet and Memrise use A.I. to create exercises and learning games tailored to each student's level and learning needs. This helps create a flexible and interactive learning environment, allowing learners to engage with real-life contexts and improve their language skills.
- 6) **Automated Testing and Assessment:** A.I. technology is also used in the automatic scoring of language tests, such as those in Pearson, ensuring objectivity and accuracy in assessments. It provides detailed grammar, vocabulary, and sentence structure feedback, helping learners identify corAI's benefits. The applications of A.I. in foreign language education have opened up many new opportunities, improving the quality of teaching and learning. However, investment in technological infrastructure and training for teachers and students on effectively using A.I. tools is essential to leverage the benefits that A.I. brings fully.

Case Studies from Other Countries:

- 1) **AlphaFold 2:** In 2020, DeepMind announced AlphaFold 2, a significant breakthrough in protein structure prediction. This algorithm solved one of the most significant challenges in molecular biology over the past half-century: the ability to accurately predict the three-dimensional structure of proteins from basic chemical information, thereby providing crucial insights into their biological functions. AlphaFold 2 was trained on a public database containing information from approximately 170,000 proteins with known structures. This technology utilizes 128 TPUv3 cores (equivalent to 100-200 GPUs), enabling efficient and rapid computations. One of AlphaFold 2's notable achievements is the successful prediction of the structures of previously unknown proteins, such as the ORF3a and ORF8 proteins of the SARS-CoV-2 virus [11].
- 2) **DALL-E by OpenAI:** In 2021, OpenAI achieved a significant milestone with the development of technology to generate images from text descriptions, known as DALL-E. This neural network allows the creation of high-quality images of abstract and even non-existent objects by combining unrelated features and applying them to existing images. Based on the G.P.T. -3 algorithm, DALL-E was trained on a large dataset of 650 million images and their corresponding text captions. DALL-E is not just a tool for image creation but also can combine different concepts, attributes, and styles to make interesting edits to user-provided images. The system can also recognize and recreate different versions of images inspired by the original, expanding its creative potential and applications across various fields [12].
- 3) **G.P.T. -4:** On July 6, 2023, the research team from OpenAI published a paper introducing G.P.T. -4, a next-generation advanced natural language processing system. With a significant parameter increase to 600 billion, G.P.T. -4 surpasses G.P.T. -3 in processing and generating natural text. The unique aspect of G.P.T. -4 is its ability to engage in deeper self-learning from large datasets, significantly improving context analysis and generating more logical and human-like text. This technology can be widely applied in fields ranging from content creation and automated translation to complex data analysis and decision support. Although it brings many benefits, G.P.T. -4 presents ethical challenges and data privacy concerns, mainly when applied in sensitive areas such as healthcare and the judiciary [13].

2.5 Application of A.I. in Teaching, Learning, and Assessment of Foreign Languages

2.5.1. Benefits of using A.I. in foreign language education

Optimization of Learning Processes: A.I. brings the ability to personalize the learning process for each student. Research has shown that students' emotions, such as confidence, boredom, confusion, stress, and anxiety, strongly affect academic performance [14-15]. In traditional education, students always have to follow a common learning path, whether or not they have mastered the knowledge, leading to many students having knowledge gaps. A.I. has helped to address this issue by personalizing the learning path based on each student's ability and level. With the support of technologies such as machine learning and data mining, A.I. helps teachers identify students' proficiency and reset appropriate learning methods and paths. This helps minimize the issue of knowledge gaps and learning losses.

Enhancement of Teaching Quality: A.I. improves teaching quality by analyzing data and providing regular feedback to students. A.I. tools such as chatbots can be helpful in education, allowing students to interact and ask questions about their field of study [15]. Therefore, A.I. can sometimes replace teachers, saving students time and cost. With the help of A.I., teaching and learning can take place anywhere, anytime, meeting the learning needs of each individual [10].

In addition to providing regular feedback, A.I. significantly reduces teachers' workload. Instead of manually grading, planning lessons, and preparing teaching materials, A.I. can automate these tasks. Teachers can know each student's level without testing, and grading becomes more accessible thanks to A.I. Therefore, teachers have more time to care for and support students, improving teaching quality and creating a better and more positive learning environment.

Improvement of Student Learning Experience: A.I. makes learning more engaging by simulating experiments, movements, and other phenomena, giving students a more realistic learning experience. For example, medical students can use virtual reality (V.R.) technology to practice complex surgeries without risking actual patients. Similarly, Perceptual Learning Modules (P.L.M.) software supports students in learning mathematics by providing opportunities

to detect patterns in similar problems rather than just teaching rules and problem-solving procedures, thereby effectively improving students' pattern recognition and problem-solving skills.

2.6 Challenges and Limitations in Implementing A.I.

Error Potential: A.I. is not a perfect solution and can encounter errors or mistakes in the evaluation and grading process. Although large language models like G.P.T. -3 can learn from a small amount of data (few-shot learning), they can still generate misleading or inaccurate information because they do not truly "understand" the information they produce [16]. When applied to foreign language education, this can lead to errors or mistakes in the evaluation and grading process.

Technical and Financial Barriers: The implementation of A.I. in education requires high costs and technical demands. Currently, the application of A.I. in education mainly comes from the private sector and large companies such as Pearson, McGraw-Hill, I.B.M., Knewton, Cerego, Smart Sparrow, Dreambox, LightSide, or Coursera [10, 17]. In Vietnam, A.I. has not yet been widely used in education. Implementing A.I. in educational institutions faces many difficulties due to a lack of technical infrastructure and funding. Moreover, few A.I. products have been specifically researched and developed for teaching, which poses challenges to applying A.I. in education.

Resistance from Faculty and Students: Teachers and students also need to improve the implementation of A.I. Teachers need to update their knowledge of A.I. and related technologies to use them effectively in teaching. This can lead to changes in teaching and learning methods, causing teacher resistance. Students may also need help using A.I. technology due to its complexity and lack of real interaction. In some cases, such as during the COVID-19 pandemic, the loneliness from the lack of interaction with teachers and peers can affect students' communication abilities and soft skill development.

Security and Privacy Issues: The development of A.I. in education must prioritize ethical data collection, analysis, and usage issues. Privacy and data security are significant challenges in applying A.I. in education today, especially when using students' data. The collection and use of personal data must be based on explicit and informed consent, ensuring transparency and fairness [17]. Since the primary focus of education is young students, protecting their data and privacy becomes even more challenging as they may not be able to provide explicit consent for collecting and using their data [10].

A.I. offers significant educational potential, particularly in teaching, learning, and assessing foreign languages. However, the implementation of A.I. also faces many challenges and limitations, from error potential, high costs, and technical requirements, to resistance from teachers and students, and ethical issues in data collection and usage. To fully harness the potential of A.I. in education, coordinated efforts from researchers, teachers, students, and educational administrators are needed to overcome these challenges and limitations..

2.7. Proposals for Applying A.I. in Vietnamese Higher Education for Foreign Language Instruction

2.7.1 Effective strategies for implementing A.I.

Training and Support for Faculty and Students: To accelerate and enhance the practical application of A.I. in foreign language education at university institutions, schools need to collaborate with leaders and industry experts to implement and organize regular teacher training programs. These training sessions provide opportunities for teachers to meet, exchange, and share experiences in applying A.I. to improve their professional management and teaching performance.

Various Vietnamese universities have organized many seminars on applying A.I. in language teaching. University of Languages and International Studies – Vietnam National University, Hanoi: Organized a training workshop on "Application of Artificial Intelligence (A.I.) in Teaching, Learning, and Assessing Foreign Languages" for their faculty members. Foreign Trade University: Held a scientific seminar on "Using Artificial Intelligence (A.I.) in Foreign Language Teaching at Higher Education Institutions." Thuy Loi University: Hosted a seminar on applying A.I. in teaching English skills to more than 40 language lecturers from Thuy Loi University and other universities in Hanoi, including University of Labor and Social Affairs, Phenikaa University, Posts and Telecommunications Institute of Technology, Academy of Finance, Hanoi National University of Education, and Vietnam University of Fine Arts. Ninh Binh Department of Education and Training: Organized training on applying A.I. in school management and guided teachers in designing online lessons using A.I. tools such as ChatGPT, Gamma A.I., and Slidesgo. Such training sessions need to be increased to speed up the application of A.I. in foreign language education at university institutions in Vietnam.

On the students' side, most current language primary students primarily use A.I. tools for vocabulary lookup, translation, and explanation of specialized terms. Among the languages, English is the most commonly applied because it is a global language, and most A.I. applications are developed by English-speaking countries, making the information more reliable than less commonly used languages like Chinese, Korean, Japanese, Thai, etc. However, students' approach to using A.I. is still limited, mainly through self-study or short tutorial videos on YouTube, without specific school guidance and training. This can lead to incorrect approaches, such as over-reliance on A.I., misuse of A.I., and ineffective query input methods. Additionally, students are not fully equipped with the skills to verify and validate information provided by A.I., leading to the absorption of incorrect or outdated knowledge. For instance, research from M.I.T. Press Direct has shown that A.I. models often operate based on extensive training datasets. Since the vast size of the data cannot be verified manually one by one, it is inevitable that training datasets contain misinformation, resulting

in models suggesting incorrect information and knowledge to learners [18]. This is especially important in foreign language teaching, where the accuracy of information is crucial for student progress.

To effectively apply A.I. in foreign language teaching, schools need to conduct in-depth training sessions for students on proper A.I. usage. These sessions should focus on explaining A.I. limitations, identifying and verifying misinformation, and proper and effective A.I. application methods in learning. By doing so, schools can help avoid misinformation, increase learning and research accuracy and effectiveness, and create a safe and reliable learning environment for students.

Technology Investment: To accelerate the application of A.I. in foreign language education, the government must address the issue of equitable access to A.I. for all students and teachers. Due to socioeconomic disparities, students from underprivileged backgrounds often have less access to modern technology and data resources compared to their wealthier peers, leading to increased educational inequality. At the 5th ASEAN+3 Education with limited I.T. facilities 2022, Vietnam's Minister of Education and Training, Nguyen Kim Son, emphasized the need for an equitable and accessible education system for all learners.

To ensure equal access to A.I. in foreign language education, the government should invest in developing I.T. infrastructure in all universities, especially in remote areas with limited I.T. facilities. Schools should also provide free accounts for students to access A.I. applications, preventing financial disparities from affecting the quality of education. Additionally, schools must train and build a knowledgeable workforce to support teachers and students in addressing AI-related issues.

Continuous Evaluation and Improvement: Implementing A.I. in foreign language education requires continuous educational program evaluation to keep pace with rapid technological advancements. Schools must establish clear criteria and evaluation metrics to measure A.I.'s impact on teaching performance and student learning outcomes. To ensure fair language competency assessments, evaluations should focus on cognitive, analytical, and practical language skills, preventing A.I. from disproportionately influencing assessment results.

Moreover, many A.I. applications collect user data during interactions, which can help schools understand A.I. usage trends among teachers and students. However, more than relying solely on A.I. data is required for comprehensive evaluation. Regular feedback from teachers and students is essential for a holistic view, enabling timely adjustments to enhance teaching and learning quality. Continuous software and algorithm updates are also necessary to maintain A.I. systems as modern and practical tools in foreign language education.

Supporting Policies and Regulations: Vietnam needs more specific policies on using A.I. in foreign language teaching at universities. However, according to the A.I. Readiness Index 2023 by Oxford Insights, Vietnam ranks 5th among ASEAN countries and 9th in East Asia in government A.I. readiness, indicating positive efforts towards A.I. development. The Vietnamese Government's national strategy for A.I. research, development, and application until 2023 underscores the importance of A.I. in education, including predicting job market demands, automating teaching processes, and personalizing learning.

Future government policies should support A.I. application in foreign language education at universities, recognizing its critical role in enhancing students' competitive advantages in the global job market. Policies should be aligned with international guidelines, such as UNESCO's A.I. and education policy framework, emphasizing human-centred A.I., equality, transparency, and data security.

Regulatory agencies and educational institutions must collaborate to expedite A.I. adoption in foreign language education. Regulatory bodies should provide funding, technology, and training resources, supporting research, data collection, and A.I. training institutions. Educational institutions' experiences and data are crucial for developing effective policies and standards for ethical and equitable A.I. implementation.

2.7.2 Building a digital learning culture

Digital learning is familiar to students and teachers at Vietnamese universities, especially post-COVID-19. Integrating e-learning systems into curricula enables flexible learning opportunities, enhancing education quality. By fostering a digital learning culture, universities can encourage using advanced technologies, including A.I., to improve foreign language learning experiences.

Familiarity with digital learning environments makes A.I. integration more natural and effective. A.I. can be embedded in e-learning systems to provide functions like automated grading and feedback, helping students improve their language skills. Additionally, digital learning culture helps teachers become adept at creating digital materials, recording lectures, and designing online exercises and tasks that A.I. can assist with, reducing workload and allowing teachers to focus on imparting knowledge and passion for language learning.

Although the development of a digital learning culture plays a significant role in accelerating the adoption of A.I. in education, many teachers still need to be more open to using A.I. due to psychological barriers. These barriers include a lack of experience with I.C.T. as learners, lack of motivation, struggle to integrate I.C.T. with their existing teaching styles and practices, feeling out of their comfort zone, fear of losing a dominant position in the classroom, fear of weakening control over students, and the concern of losing students' respect. Not only teachers but many students also express psychological concerns when using A.I. in language learning. Phuong's research indicates that students often distrust AI-generated results for assignments requiring high creativity or worry about the potential for errors or misleading suggestions, which could lead to mistakes in the learning process. Issues related to plagiarism are also noteworthy concerns that make students hesitant to use A.I., as A.I. usage may result in the unintentional submission of similar essays among students. Furthermore, many students express concerns about over-reliance on A.I. tools in their

studies. This dependence could discourage critical thinking and delay the development of personal thoughts and ideas, impeding creativity and language development.

To enhance the feasibility and effectiveness of applying A.I. in the language education system in Vietnam, schools need to establish various extensive training and guidance programs aimed at equipping skills for using and integrating A.I. in teaching and learning and helping teachers overcome psychological barriers when using A.I. More importantly, these programs must help teachers recognize that A.I. is not replacing humans but a supportive tool that optimizes the teaching process and provides critical student data. Additionally, students should be encouraged to use A.I. as a supportive tool in their learning process rather than relying solely on it for academic success. Training sessions should emphasize the benefits and potential risks of improper A.I. application, providing teachers and students with a comprehensive perspective and appropriate considerations for using this technology to enhance educational quality.

3 DISCUSSION

Artificial intelligence (A.I.) is pivotal in revolutionizing foreign language education, offering numerous benefits that enhance teaching and learning experiences. One of A.I.'s significant contributions is its ability to personalize learning paths tailored to individual student needs. Traditional education often follows a uniform approach that may not cater to each student's unique pace or learning style, leading to knowledge gaps and varying levels of comprehension. A.I. addresses this challenge by leveraging technologies such as machine learning and data mining to assess student proficiency levels accurately. This enables educators to adjust teaching methods and materials accordingly, ensuring each student receives targeted support and guidance.

Moreover, A.I. enhances teaching quality by automating routine tasks such as grading assignments and providing real-time feedback to students. By analyzing large volumes of data, A.I. can identify learning patterns and areas where students may need additional assistance, thus allowing teachers to focus more on personalized instruction rather than administrative tasks. This shift improves efficiency and fosters a more supportive learning environment where students feel empowered to explore and learn at their own pace.

Furthermore, A.I. enriches the learning experience by introducing interactive and immersive elements. AI-driven platforms can create personalized learning modules that adapt to students' progress, offering interactive exercises and simulations that engage and motivate learners.

In essence, A.I.'s integration into foreign language education holds promise for transforming traditional teaching paradigms into dynamic, personalized learning experiences. By leveraging A.I. technologies, educators can better meet the diverse needs of students, improve teaching effectiveness, and create a more engaging and interactive educational environment that prepares learners for the challenges of a globalized world.

The proposed integration of artificial intelligence (A.I.) into foreign language education at Vietnamese universities shows strong feasibility. It focuses on training teachers in A.I. tools, enhancing technological infrastructure for interactive learning, and implementing AI-driven assessment systems. These initiatives aim to personalize learning, improve educational outcomes, and foster innovation in educational practices. With supportive policies and international collaboration, this approach promises to revolutionize language education in Vietnam, aligning it with global educational advancements.

4 CONCLUSION

The application of artificial intelligence (A.I.) in foreign language education is gaining global traction. Still, it needs to be improved in Vietnam as the government seeks suitable directions for its implementation. Currently, A.I. is utilized in some schools primarily through applications such as Intelligent Tutoring Systems (Duolingo), Natural Language Processing (Grammarly), Learning Analytics on Platforms (Coursera), Computer Vision (Kahoot)... These AI-driven platforms significantly optimize learning processes by personalizing education for each student, enhancing teaching quality through data analysis and feedback mechanisms, and improving student learning experiences by simulating real-world scenarios. However, A.I. adoption faces challenges such as error potentials in evaluation processes, high technical and financial demands, and resistance from educators and students who require updated knowledge and skills. Collaboration between educational institutions and the Ministry of Education in A.I. training programs for students and teachers is crucial to address these challenges. These programs educate on A.I. use in education and help overcome governmental barriers. Investment in I.T. infrastructure by schools, supported by government policy and guidelines on A.I. application in education, is essential to ensuring equitable access to A.I. for students and educators while ensuring transparency, fairness, and user safety. This collaborative approach aims to mitigate challenges, foster effective A.I. integration in education, and pave the way for a more inclusive and innovative learning environment in Vietnam.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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