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The Application of Artificial Intelligence to Teaching Pedagogical Scenarios for Student Teachers at School of Foreign Language, Thai Nguyen University

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ABSTRACT: This paper delves into the research on the application of artificial intelligence (AI) in teaching pedagogical situations for foreign language pedagogy students. It provides a comprehensive overview of AI and its potential applications in the field of education, analyzes the current situation of teaching pedagogical situations, proposes effective AI application solutions, and discusses the opportunities, challenges, and ethical issues related to the application of AI in education in general, and in teaching pedagogical situations for foreign language pedagogy students in particular**.**

Keys: Artificial Intelligence (AI), Pedagogical situations,Innovative teaching methods.

I. INTRODUCTION

The Industry 4.0 revolution, with the explosion of artificial intelligence (AI), is reshaping the future of many industries, including education. AI is not just a tool, but also a key to unlocking breakthrough teaching methods, improving the quality of training to meet the increasingly stringent requirements of the labor market for high-quality human resources as well as the needs of modern society.

In reality, the teaching of pedagogical situations for foreign language pedagogy students still has many limitations. Traditional methods such as role-playing and group discussions, while having certain advantages, have not really maximized students' ability to solve situations. Students lack opportunities to experience diverse and complex situations and lack timely and personalized feedback to improve their skills. Artificial intelligence, with its ability to process large amounts of data, analyze, predict and provide optimal solutions, is expected to bring breakthroughs in the field of education, especially in teaching pedagogical situations. AI can help create realistic and diverse simulated situations, provide instant feedback and personalize the learning experience for each student.

II. OVERVIEW OF ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS IN EDUCATION

2.1 What is Artificial Intelligence?

Artificial intelligence (AI) is a field of computer science focused on creating machines capable of simulating human intelligence, such as learning, thinking, problem-solving, and decision-making (Russell & Norvig, 2010). AI encompasses many smaller fields, such as machine learning, natural language processing, computer vision, and robotics.

2.2 Applications of Artificial Intelligence in Education

AI has been and is being widely applied in education, from developing software to support teaching and learning, to creating intelligent online learning platforms. Some specific applications include:

Adaptive learning systems: AI can analyze data on students' learning progress to provide content and learning methods suitable for each individual (Holmes et al., 2019). For example, the system can suggest exercises, reference materials, or lecture videos that match the student's level and interests.

Automated assessment tools: AI can automatically grade tests, assess students' writing and speaking abilities, helping teachers save time and effort (Shermis & Hamner, 2012). For example, AI can grade essays based on grammar, vocabulary, sentence structure, and content.

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Virtual assistants: AI can act as a virtual assistant, answering students' questions, providing information, and supporting them in the learning process (Luckin et al., 2016). For example, chatbots can answer students' questions about lessons, provide learning tips, or guide them in finding materials.

Fraud detection: AI can analyze data on students' behavior to detect cheating behaviors in learning, such as copying assignments or using unauthorized materials.

Personalizing learning paths: AI can create separate learning paths for each student, based on their goals, abilities, and interests.

III. THE CURRENT SITUATION OF TEACHING PEDAGOGICAL SITUATIONS FOR FOREIGN LANGUAGE PEDAGOGY STUDENTS

3.1 Description of Common Pedagogical Situations

In the process of teaching foreign languages, pedagogy students often face many different pedagogical situations, such as:

Classroom management: How to maintain discipline and order in the classroom when there are many students with different personalities and levels? How to handle situations where students disrupt the class, are not focused, or have negative behaviors?

Communicating with students: How to convey knowledge effectively and motivate students? How to resolve conflicts, misunderstandings, or disagreements with students?

Handling arising problems: How to solve problems such as students not doing homework, students having difficulties in learning, or parents having objections?

Specific situations in foreign language teaching: How to help students pronounce correctly, master grammar and vocabulary, or develop listening, speaking, reading, and writing skills? How to create a lively, engaging, and appropriate learning environment for each student?

3.2 Current Teaching Methods of Pedagogical Situations

Currently, common teaching methods of pedagogical situations include:

Role-playing: Students play the roles of characters in the situation to experience and learn.

Group discussions: Students discuss and share opinions on how to solve the situation.

Situation analysis: The teacher presents a specific situation and guides students to analyze and evaluate it.

Case study: Students research a real case and offer solutions.

However, these methods still have some limitations, such as:

- Difficulty in creating diverse and rich situations: Teachers often have difficulty in creating realistic and diverse simulated situations, especially complex or rare situations.
- Difficulty in personalizing the learning experience for each student: Traditional methods often find it difficult to meet the different needs and levels of each student.
- Difficulty in objectively and comprehensively assessing students' ability to solve situations: The assessment of students' abilities is often based on the teacher's subjective observation, lacking objectivity and comprehensiveness.

Lack of timely and specific feedback: Students often do not receive immediate feedback on their way of solving situations, leading to difficulties in improving skills.

IV. APPLYING ARTIFICIAL INTELLIGENCE IN TEACHING PEDAGOGICAL SITUATIONS

4.1 Tools and platforms that can be used

Situation simulation software: This software allows the creation of virtual pedagogical situations in which students can interact and make decisions. AI can be integrated into the software to create interactive scenarios that change flexibly according to students' actions and provide instant feedback.

Data analysis applications: These applications can analyze data on students' learning progress (e.g., decisions made, thinking time, level of interaction) to provide assessments and suggestions. AI can help identify students' strengths and weaknesses and suggest appropriate learning methods.

Support chatbots: Chatbots can answer students' questions, provide information, and support them in the learning process. Chatbots can be programmed to provide suggestions, instructions, or feedback on how to solve situations.

Adaptive learning systems: AI can be used to create adaptive learning systems that automatically adjust the difficulty of the situation, provide appropriate reference materials, and offer suggestions and feedback based on the ability and progress of each student.

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Video analysis tools: AI can analyze videos of students' lessons or practice sessions to assess communication skills, handling situations, and other aspects of pedagogical competence.
Learning social networks: AI can be integrated into learning social networks to create discussion forums where students can share experiences, ask questions, and comment on pedagogical situations.

4.2 Steps to Apply Artificial Intelligence in Teaching

Identify goals and needs: Before applying AI, it is necessary to clearly define the goals of teaching pedagogical situations and what students need to develop their abilities.
Choose appropriate tools and platforms: Based on the goals and needs, select appropriate AI tools and platforms.
Build a system of pedagogical situations: Build a system of diverse and rich pedagogical situations that realistically simulate situations that may occur in practice.
Design learning activities: Design learning activities using AI tools and platforms so that students can experience, interact, and learn.
Evaluate and adjust: Evaluate the effectiveness of applying AI and adjust learning activities accordingly.

4.3 Illustrative Example

Suppose a student encounters a situation where a student in the class does not do their homework. The teacher can use situation simulation software to create a scenario in which the student has to face this situation and offer solutions. The software will record the student's decisions and provide feedback, helping the student learn and gain experience.

Example:
Situation: Student A does not do their homework.

Student's choices:
- Gently remind and ask why.
- Criticize and ask to redo.
- Find out the reason and have support measures.

Software feedback:
If the student chooses "**gently remind and ask why**", the software can provide feedback such as: "**The student may feel respected and willing to share their problem**."
If the student chooses "**criticize and ask to redo**", the software can provide feedback such as: "**The student may feel scared or demotivated**."
If the student chooses "**find out the reason and have support measures**", the software can provide feedback such as: "**This is a positive approach, helping students solve problems and improve learning.**"

V. DISCUSSION AND RECOMMENDATIONS

5.1 Opportunities and Challenges

The application of AI in teaching pedagogical situations brings many opportunities, such as:

Enhancing interactivity and liveliness: AI helps create realistic, diverse, and engaging simulated situations, increasing interaction between students and the situation.

Personalizing the learning experience: AI allows for personalizing the learning experience for each student, based on their abilities, progress, and needs.

Objective and comprehensive assessment: AI helps assess students' ability to solve situations in a more objective, comprehensive, and accurate way.

Providing timely and specific feedback: AI provides immediate and specific feedback on students' way of solving situations, helping them improve their skills.

However, there are also many challenges, including:

Investment costs: Investing in AI technology requires significant costs.

Requirements for skills and knowledge: Teachers need certain skills and knowledge to effectively use AI tools and platforms.

Ethical and security issues: The use of AI in education raises questions about ethics and the protection of students' personal information.

5.2 Solutions and Recommendations

To effectively apply AI in teaching pedagogical situations, coordinated collaboration among relevant parties is needed, including:

Schools:
- Invest in facilities, equip AI technology and software.
- Organize training courses for teachers on using AI.
- Develop policies on ethics and information security when using AI.

Teachers:

- Actively learn and improve their ability to use technology and AI.
- Proactively seek and share experiences and materials on AI applications.
- Design creative and effective learning activities with the support of AI.

Students:

- Actively and positively participate in learning activities that apply AI.
- Use AI consciously and responsibly.
- Contribute ideas to improve AI tools and platforms.

VI. CONCLUSION

The application of artificial intelligence in teaching pedagogical situations is an inevitable trend in the context of the Industry 4.0 revolution. Taking advantage of AI technologies not only helps improve teaching effectiveness but also contributes to developing students' ability to solve situations, meeting the increasingly high demands of society for quality human resources.

However, to apply AI effectively, careful preparation is needed regarding facilities, teaching staff, and ethical and security issues. At the same time, coordinated collaboration between schools, teachers, and students is needed to achieve the best results.

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