

Exploring the Practical Teaching Mode of Language Laboratory based on Artificial Intelligence

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Abstract: With the rapid development of artificial intelligence (AI) technology, its application in the field of education is becoming more and more extensive, especially in the teaching mode of language laboratory, AI technology shows great potential and innovation space. The purpose of this paper is to explore the practical teaching mode of language lab based on artificial intelligence, and to reveal its advantages and challenges in language learning by analysing the current status of the application of AI technology in teaching. This study aims to explore the in-depth analysis of the research on the practical teaching mode of language labs based on artificial intelligence. Firstly, it introduces the problems of language labs and analyses the limitations and problems of traditional labs. Secondly, the language laboratory solution measures are elaborated in detail to construct the practical teaching mode of language laboratory based on artificial intelligence. Then, the practical teaching mode of language laboratory based on artificial intelligence is explored. Finally, the application value of the language laboratory of artificial intelligence in the aspects of linguistic research and teaching practicability is discussed. As an innovative application of educational technology, the language laboratory of artificial intelligence has a positive role in promoting the transformation of the modern language teaching mode, and provides new perspectives and methods for foreign language teaching. This paper focuses on the design and construction of the practical language teaching mode of artificial intelligence. With the rapid development of artificial intelligence technology, its application in the field of education has become increasingly widespread. In language teaching, the construction of an AI-based practical teaching model can help to improve teaching efficiency and quality and stimulate students' interest in learning. This paper elaborates the design principles, construction elements, implementation process and effect evaluation of this teaching mode from various aspects.

Keywords: Artificial Intelligence; Language Lab; Practical Teaching Mode.

1. Introduction

With the rapid development of the Internet and the continuous breakthrough of artificial intelligence technology, the language laboratory of artificial intelligence is used as an indispensable part of language practical teaching. The language laboratory practice teaching mode of artificial intelligence is committed to exploring the cutting-edge issues of the language laboratory practice teaching mode of artificial intelligence and applying it to the field of language disciplines. It not only provides a more flexible and convenient practice environment, but also expands the boundaries of language discipline teaching and provides students with richer and more diverse learning experiences. The purpose of this study is to propose the construction of a language laboratory practice teaching model of artificial intelligence through the study of the language laboratory practice teaching model of artificial intelligence in order to solve the problems of language laboratory practice.

1.1. Background of the Study

In today's digital era, artificial intelligence has become an important driving force for change in various fields. In the field of education, especially in language teaching, the traditional teaching mode gradually shows some limitations. And the integration of artificial intelligence technology brings new opportunities and challenges for language practice teaching.

1.2. Research Significance

Exploring the language practice teaching mode of artificial

intelligence is of far-reaching significance for improving students' comprehensive language application ability and cultivating innovative talents to meet the needs of the times. It can not only enrich teaching resources and teaching methods, but also provide students with a more personalised and efficient learning experience.

2. Challenges and Solutions to Practical Teaching in Language Laboratory

2.1. Challenges of Practical Teaching in Language Laboratory

With the continuous progress of artificial intelligence technology, language laboratory practice has become an important venue for teachers in their daily teaching. At present, there are still some problems in language laboratory practice, and it is necessary to build a language laboratory practice teaching model of artificial intelligence and conduct in-depth research to improve the performance of the system and user experience. The main problems of language laboratory practice exist.

2.1.1. Insufficient Technical Support, Data Security and Privacy Issues

The development of artificial intelligence technology provides many opportunities for language labs, but there is still the problem of insufficient technical support [1]. For example, the accuracy of language recognition and natural language processing still needs to be improved, and the system's ability to understand complex linguistic expressions

is limited to meet students' individual needs. The laboratory handles a large amount of student data, including language, text, and personal information. Data security and privacy protection is an important issue. Possible data breaches and misuse raise concerns for students and teachers.

2.1.2. Inadequate Teaching Content and Resources

It is more difficult for the lab to provide rich teaching content and resources to meet the needs of different students. There are problems of insufficient richness of teaching content and resources to meet the diverse learning needs of students. There exists a lack of student participation and interaction, and students are more in a state of passive acceptance.

2.1.3. Inadequacy of Technical Equipment and Facilities

The laboratory uses specific technical equipment and facilities to support language interaction and learning activities. There may be a problem of inadequate equipment and facilities, resulting in students not being able to fully utilise the laboratory resources for learning and practice. There may be problems of inadequate training and support of faculty, resulting in students not being able to receive effective guidance and assistance.

2.1.4. Inadequate Student Assessment and Feedback Mechanisms

The laboratory establishes an effective student assessment and feedback mechanism to understand the learning situation and needs of students, and fails to make timely adjustments and improvements. There may be issues with inadequate assessment and feedback mechanisms that result in students not receiving timely feedback and support.

2.2. Measures to Solve the Problems of Practical Teaching in Language Laboratories

In order to solve the problems of practical language teaching, the following measures are taken to improve the outstanding problems of practical language laboratory teaching.

the lab with higher language comprehension and generation capabilities. For example, the Purchase Practice Teaching Platform should include an intelligent dialogue system to enable real-time communication and interaction with students, thus providing more personalised and targeted language learning support.

In terms of data security and privacy issues, data security and privacy protection measures are adopted to ensure that students' data are reasonably used and protected. Technical means such as encryption and permission control are used to ensure data security and privacy [2].

2.2.2. Integration of Pedagogical Content and Resources

In terms of teaching content and resources, the integration of teaching content and resources through AI databases provides more diverse and practical learning materials and activities. The practical teaching model of language labs with artificial intelligence cooperates with other language subject teaching institutions, enterprises and social organisations to carry out more diverse and practical language practice projects. For example, it cooperates with foreign language training organisations to provide online foreign language exchange and cultural experience activities, and cooperates with translation companies to carry out practical projects such as machine translation and corpus construction.

2.2.3. Participation and Interactivity

In terms of student engagement and interactivity, design interactive and engaging AI learning tools and activities to encourage active participation and interaction. For example, provide a platform for online discussions and collaborative learning, and organize virtual experiments and role-playing activities. Students engage in language learning and practical activities through the online platform. The online resources of the Language Lab of Industrial Intelligence are used to train various language skills, such as listening, speaking, reading and writing, and to improve language expression by interacting with the virtual language. In addition, the Language Laboratory of Industrial Intelligence provides support for artificial intelligence technologies such as language recognition, natural language processing, and machine translation to help students better understand and apply their language knowledge. It also promotes collaboration and communication among students. Through the online platform, students engage in practical language activities with other students and work together on various language tasks and projects. This kind of cooperation and communication not only improves students' language proficiency, but also develops their teamwork and intercultural communication skills. In addition, it also expands the boundaries of language discipline teaching. By cooperating with the practical teaching models of other disciplines, interdisciplinary practical projects and research are carried out to promote cross-fertilisation and innovation among different disciplines. For example, co-operation with practical teaching models in the field of computer science to carry out research and applications in natural language processing and machine translation.

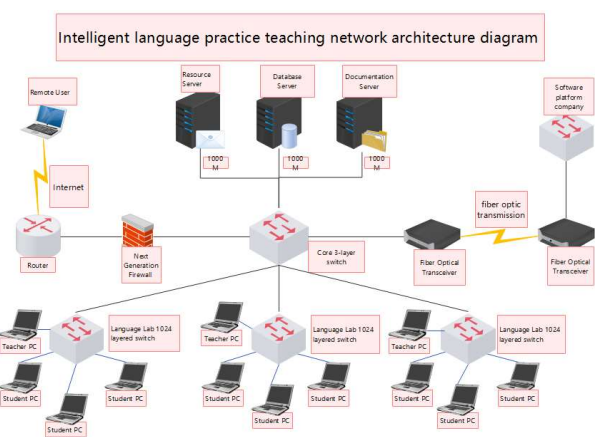


Figure 1. Artificial Intelligence Language Practice Teaching Model Diagram

2.2.1. Advanced Technology Technical Means

In terms of insufficient technical support, improve the system's ability to understand complex language expressions by using advanced deep learning and neural network models. Improve the intelligence level of the system by introducing more advanced artificial intelligence technologies, deep learning and natural language processing, etc., so as to equip

2.2.4. Upgrades and Improvements

In terms of improvement of technical equipment and facilities, upgrade and improve the technical equipment and facilities in the laboratories to meet the needs of students. For example, increase the language recognition and interaction equipment in the language lab of Industrial Intelligence, provide better network connection and computing resources.

In terms of faculty development and support, regular and occasional faculty training programmes are used to improve professional quality and teaching ability. [3] Provide teacher training and support programmes to help teachers become proficient in language lab language technology and teaching methods for industrial intelligence. Enhance interdisciplinary research and innovation with disciplines such as computer science, psychology, and education. For example, collaborate with experts in the field of computer science to conduct research on natural language processing and machine learning algorithms; collaborate with experts in the field of psychology to study the cognitive process and psychological mechanisms of language learning.

2.2.5. Timely Assessment and Feedback Mechanisms

In terms of student assessment and feedback mechanism, the language labs of IFT establish an effective student feedback mechanism to keep abreast of students' learning situation and needs, and make adjustments and improvements. By collecting students' feedback through online quizzes, homework feedback, student questionnaires and student interviews, the Language Laboratory for Industrial Intelligence continues to improve the user experience. For example, based on students' language and text data, it analyses their grammar, speech and vocabulary, and gives them appropriate advice and guidance to help them improve their language expression.

2.2.6. Efficient Personalized Diverse Environment

The practical teaching mode of language labs with artificial intelligence will better meet the needs of language subject teaching, provide a more efficient, personalised and diversified language learning and practice environment, cultivate students' language proficiency and cross-cultural communication ability, and promote the innovation and development of language subject teaching. It gradually solves the problems existing in the practical teaching mode of language labs, improves the performance and user experience of the labs, and provides a better learning and practice environment for students. By improving technical equipment and facilities, training and supporting the teaching staff, and establishing student assessment and feedback mechanisms, the language labs of Industrial Intelligence provide students with better language learning and practice environments, and improve their learning effectiveness and satisfaction [4].

3. The Design and Construction of the Practical Teaching Mode of Language Laboratory of Artificial Intelligence

The practical teaching mode of language laboratory of artificial intelligence should focus on the combination of practice and theory to cultivate students' practical operation ability and problem solving ability. In terms of laboratory practice, students carry out specific practical operations in the laboratory, such as using language acquisition equipment, language recognition and so on. Laboratory practice is carried out by individuals or groups, and students practice according to the lab guide or project requirements; in project practice, students participate in actual project experiences, such as language assistant applications, language recognition systems and so on. Project practice exercises students' teamwork ability and project management ability, and also provides practical opportunities that are closer to real-world

applications; in practice, students participate in projects in enterprises or research institutes to experience the actual working environment and workflow first-hand. [5]

3.1. Design Principles of AI Language Practice Teaching Model

3.1.1. Principle of Personalisation

Artificial intelligence technology can tailor the learning plan and learning content for each student according to their learning progress, ability level, learning style and interests. [6] For example, by analysing the data of students' learning behaviour on the language learning platform, such as the accuracy rate of questions, reading speed, listening comprehension level, etc., it pushes suitable learning materials and practice tasks for them.

3.1.2. Principle of Interactivity

Emphasis is placed on interactive communication between students and the AI system. Intelligent voice assistants can engage in real-time dialogue with students, correcting pronunciation and providing instant explanations of vocabulary and grammar. Meanwhile, the AI-based online learning community allows students to communicate with each other and learn cooperatively to improve their language practice skills.

3.1.3. Principle of Contextuality

Artificial intelligence is used to create realistic language learning situations. For example, through virtual reality (VR) and augmented reality (AR) technology, students can immerse themselves in the language environments of different countries and regions, such as practicing language communication in simulated restaurants, airports, shopping malls and other scenes.

3.1.4. Principle of Dynamism

The teaching mode should be able to be dynamically adjusted according to students' learning and teaching effect. The AI system can monitor students' learning status in real time, and when it is found that students have difficulties in a certain knowledge point, it will automatically adjust the teaching progress and difficulty, and increase the practice and explanation of related knowledge points.

3.2. Elements of the Construction of the Artificial Intelligence Language Practice Teaching Mode

3.2.1. Intelligent Teaching Platform

Resource Integration and Management

The intelligent teaching platform should have the ability to integrate multiple language learning resources, including teaching materials, online courses, learning videos, audio materials and so on. At the same time, it is able to classify and manage these resources, which is convenient for teachers and students to retrieve and use them quickly. Provide detailed instructions on experimental operation and related theoretical knowledge to help students understand the purpose of the experiment and the operation steps; in terms of language tools and software platforms, provide language tools and software platforms used by students, such as language recognition and synthesis toolkits, deep learning frameworks, etc.; in terms of datasets and sample codes, provide language datasets and sample codes required for practical teaching for students to carry out experiments; in terms of online learning resources, integrating learning resources on the web to help students learn relevant knowledge and technology in depth.

Learning Path Planning

According to students' learning goals and current levels, a reasonable learning path is planned for them. For example, for students who want to pass the IELTS exam, the platform can make a detailed learning plan from vocabulary accumulation, grammar consolidation to listening, reading and writing special training according to their current English level. By designing reasonable practical teaching activities and carrying out effective organisation and management. In terms of making practical teaching plans, the practical teaching plans are made according to the course objectives and students' learning needs, and the contents, objectives and arrangements of practical teaching are clearly defined; in terms of group guidance, students are grouped into groups for practical teaching according to their interests and professional backgrounds, and each group has an instructor for guidance and counselling; in terms of regular assessment and feedback, the results of the students' practical teaching are regularly assessed and feedback is given in a timely manner to help students improve and enhance; in terms of resource sharing and communication, students are encouraged to share resources and communicate with each other, such as sharing experimental results, exchanging problems and solutions, and so on, so as to promote interaction and learning among students. [7]

3.2.2. Intelligent Assessment System

Formative Assessment

By analysing the data in the process of students' learning, such as classroom participation, homework completion, online test scores, etc., students' learning problems and progress can be found in a timely manner. For example, real-time feedback and improvement suggestions are given based on students' pronunciation accuracy, fluency and other indicators in speaking practice. Industrial Intelligence's language lab assesses students' practical teaching results and gives timely feedback. The assessment includes lab reports, project results, internship reports and other forms to evaluate students' practical ability and comprehensive quality.

Summative Assessment

At the end of the learning stage, students' language knowledge and skills are comprehensively assessed. For example, AI is used to automatically correct essays, giving detailed evaluations and scores in many aspects such as grammar, vocabulary and logical structure.

3.2.3. Intelligent Tutor

Answering Questions and Solving Confusions

Intelligent Tutor is able to answer questions that students encounter in the learning process at any time. Whether it is the meaning of vocabulary, the rules of grammar, or the skills of language expression, the Smart Tutor can quickly provide accurate answers and detailed explanations.

Learning Guidance

Based on students' learning data and assessment results, personalised learning guidance is provided to students. For example, for students who are weak in listening comprehension, the Smart Tutor can suggest a combination of intensive and extensive listening and recommend suitable listening materials.

3.2.4. Intelligent Learning Partner

Dialogue Practice

The Intelligent Learning Partner can have a natural and fluent dialogue with students to improve their oral expression

and reaction speed. It can simulate different roles and situations so that students can practice in diverse dialogue scenarios.

Emotional Support

In the learning process, the intelligent learning partner can give students certain emotional support, such as encouragement and praise, to enhance students' confidence and motivation in learning.

3.3. Implementation Process of AI language Practice Teaching Mode

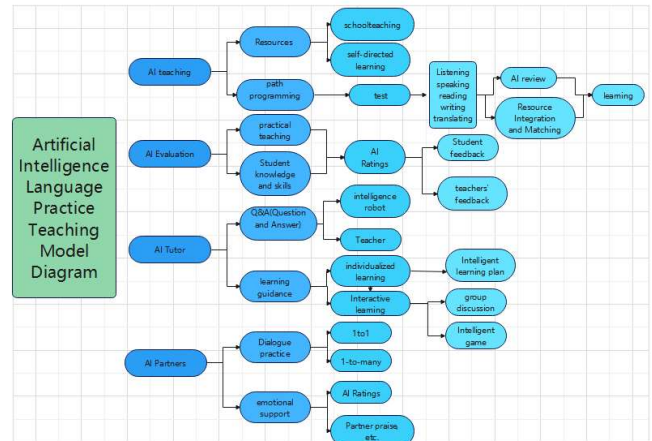


Figure 2. Artificial Intelligence Language Practice Teaching Model Diagram

3.3.1. Teaching Preparation Stage

Teacher training

Teachers need to be trained on how to use AI teaching tools and how to adjust teaching strategies. For example, learning how to use the intelligent teaching platform for curriculum design, how to interpret the data analysis results of the intelligent assessment system, etc.

Student Information Collection

Collect students' basic information, learning experience, language level and other relevant data so that the AI system can provide personalised learning services for students.

3.3.2. Teaching Implementation Phase

Implementation of personalised learning plan

Students learn according to the learning plan formulated for them by the intelligent teaching platform. During the learning process, Smart Tutor and Smart Learning Partner will provide appropriate guidance and assistance.

Implementation of Interactive Learning Activities

Organize students to participate in AI-based interactive learning activities, such as online group discussions and intelligent voice dialogue competitions. Through these activities, improve students' language practice ability and teamwork ability.

3.3.3. Teaching Feedback Phase

Student Feedback

Students will feedback to the teacher and the AI system about the problems they encountered in the learning process, their feelings and suggestions about the teaching mode. For example, students may reflect that the dialogue difficulty of the intelligent learning partner is too high or too low and needs to be adjusted.

Teacher Feedback

Teachers adjust and optimise the teaching process based on students' learning, the data analysis results of the intelligent assessment system, and students' feedback. For example, if it

is found that most students have difficulties in a certain knowledge point, the teacher can focus on explaining and tutoring in class.

3.4. Assessment of the Effectiveness of the AI Language Practice Teaching Model

3.4.1. Assessment Indicators

Language proficiency enhancement

By comparing the students' language test scores before and after the implementation of the AI language practice teaching mode, such as vocabulary, grammar mastery, and scores of listening, speaking, reading and writing skills, etc., it is assessed whether the students' language proficiency has been effectively improved.

Learning interest and motivation

Through questionnaires and classroom observation, we learnt about the students' interest in the AI language practice teaching model and their motivation to participate. For example, statistics on the number of student logins on the intelligent learning platform and the length of study reflect the students' learning enthusiasm.

3.4.2. Assessment Methods

Quantitative Assessment

Quantitative methods such as standardised language tests and learning data statistics are used to objectively assess teaching effectiveness. For example, calculate the mean score, standard deviation and other statistical indicators of the students' various achievements in the intelligent assessment system to analyse the overall situation and individual differences in teaching effectiveness.

Qualitative Assessment

Through qualitative methods such as interviews and case analyses, we gain an in-depth understanding of the subjective feelings and experiences of students and teachers about the teaching model. For example, interviews were conducted with some students and teachers to ask for their views on the strengths and weaknesses of the AI language practice teaching model.

4. The Application Value of Language Laboratory with Artificial Intelligence in Linguistic Research and Teaching Practicalisation

The application value of the language laboratory of artificial intelligence in linguistics research and teaching practice is reflected in many aspects, such as promoting language research, improving teaching quality and promoting cross-disciplinary development. The laboratory uses advanced artificial intelligence technology to provide new tools and methods for linguistic research and teaching, and also promotes the cross-fertilisation of linguistics and other related disciplines.

4.1. Promoting Linguistic Research to Enhance Teaching Quality

Providing large-scale data processing capabilities, the AI lab is able to process and analyse large-scale language data, providing strong data support for language research. Deepen language cognitive research Through technologies such as brain-computer interface and cognitive science, the AI language lab can deeply explore the relationship between language and the brain and promote the development of

language cognitive research. Expanding new areas of language research The application of AI technology has opened up new areas for linguistic research, such as multilingual scientific research and multilingual corpus research. Achieve personalised teaching AI technology can provide personalised teaching content and methods according to each student's learning situation, improving the teaching effect. Enhance Interactivity and Interestingness Tools in AI language labs, such as ChatGPT, can interact with students, increase the interestingness of learning, and improve students' motivation to learn. Optimise teaching assessment Using AI technology can monitor and assess students' learning progress and effects in real time, helping teachers adjust teaching strategies in a timely manner [8].

4.2. Promoting Cross-disciplinary Development

Promoting the integration of linguistics and AI, the AI language laboratory becomes a platform for the cross-fertilisation of linguistics and artificial intelligence and other fields, promoting interdisciplinary research and innovation. Supporting multidisciplinary collaborative research The AI Language Lab provides a platform for technical support and resource integration for the collaborative research of multiple disciplines, such as linguistics, psychology, and cognitive science. Stimulate new research directions The introduction of AI technology has raised new research questions and methods for linguistic research, stimulating new thinking in the academic community about traditional linguistic research [9].

4.3. Promoting Education Informatisation and Intelligence to Enhance the International Influence of Research and Teaching

Promoting the process of education informatisation, the construction and application of AI language laboratories is an important part of education informatisation, which promotes the modernisation and transformation of education methods. Realising a Smart Learning Environment By constructing smart classrooms and utilising smart learning software, AI language laboratories offer the possibility of realising a smarter learning environment [10]. Enhance international cooperation and exchange The research results and teaching methods of AI language laboratories can enhance the academic status and influence of the institution in the international arena. Promote international educational cooperation projects AI Language Laboratory can become an important base for international educational cooperation projects and promote the exchange and sharing of international educational resources.

4.4. Cultivate Innovative Talents to Promote Social Applications and Services

Cultivating interdisciplinary talents and cultivating composite talents with knowledge of linguistics, artificial intelligence and other related disciplines provide conditions. Improve students' innovative ability By participating in the research projects of AI Language Lab, students can improve their scientific research ability and innovative thinking. Serving the needs of social development The research results of AI Language Lab can directly serve the society, such as the development and promotion of intelligent educational aids. Provide scientific data analysis and decision-making support

for the development of education and language policies.

4.5. Challenges of AI

Ensure that both teachers and students can keep up with the pace of technological development and enhance their IT literacy through training and education. When using AI technology for teaching, care needs to be taken to balance the use of technology and humanistic care, and to avoid over-reliance on technology at the expense of the humanistic spirit of education. Protect students' privacy and data security, and ensure that appropriate laws, regulations and ethical standards are followed when using AI technology. Consider the sustainability and renewal of the technology to ensure the long-term effective use of AI technology in linguistic research and teaching practice.

5. Conclusion and Outlook

5.1. Research Conclusion

Through the research on the design and construction of the AI language practice teaching model, it is found that the teaching model has significant advantages in improving students' language proficiency and stimulating their interest in learning. The design principles of personalisation, interactivity, contextuality and dynamism, as well as the building elements of intelligent teaching platform, intelligent assessment system, intelligent tutor and intelligent learning partner work together to provide students with an efficient and high-quality language learning environment.

The application value of AI's language lab in linguistics research and teaching practicability is multifaceted, which not only promotes the research and development of linguistics, but also enhances the quality and efficiency of teaching, as well as promotes the cross-fertilisation of linguistics and other disciplines, cultivates innovative talents and promotes the process of education informatisation. In order to maximise the role of AI language labs, it is also necessary to continuously improve the IT literacy of teachers and students, focus on humanistic care, protect privacy and data security, and ensure the sustainable development of the technology.

5.2. Outlook

With the continuous development and improvement of AI technology, the future AI language practice teaching mode will be more intelligent and diversified. For example, AI will be able to more accurately analyse the emotional state of students and provide more intimate emotional support; virtual reality and augmented reality technology will be more deeply integrated with language teaching to create a more realistic learning situation. At the same time, it is also necessary to pay attention to the problems that may arise in the application of

AI in the field of education, such as data security, technology dependence, etc., to ensure that the application of AI in language teaching can develop in a healthy and sustainable way.

The manuscript should include a conclusion. In this section, summarize what was described in your paper. Future directions may also be included in this section. Authors are strongly encouraged not to reference multiple figures or tables in the conclusion; these should be referenced in the body of the paper.

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