Language Acquisition Pattern Recognition and Personalized Teaching Strategies Based on Artificial Intelligence

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Abstract: The purpose of this paper is to deeply discuss the identification of language acquisition patterns based on AI (Artificial intelligence) and its application in teaching, so as to formulate and implement personalized teaching strategies and improve the effect of language teaching. Therefore, this paper first reviews the traditional research on language acquisition, and based on behaviorism and cognitive theory, divides language acquisition modes into two categories: natural acquisition and teaching acquisition, and further considers the individual differences of learners, learning environment and learning strategies. In terms of methods, this paper adopts a comprehensive feature analysis method to evaluate learners' language ability, learning motivation, learning style and cognitive style. Based on these analyses, we can set individualized teaching objectives for learners and choose suitable teaching contents and methods. The research shows that the identification of language acquisition mode based on AI and the formulation and implementation of personalized teaching strategies are of great significance for improving language teaching effect. Through comprehensive feature analysis, teachers can better understand learners, meet their unique needs and promote the all-round development of their language ability.

1. Introduction

Under the background of globalization, language acquisition has become an important cornerstone of individual development and social communication [1]. Whether it is mother tongue acquisition or second language learning, the process and mode of language acquisition have attracted much attention [2-3]. Traditional language acquisition research is mostly based on behaviorism and cognitive theory, emphasizing the role of language input, interaction and internal cognitive mechanism [4]. However, with the rapid development of big data and AI technology, language acquisition research has ushered in new opportunities [5]. AI technology can process and analyze massive data, reveal complex patterns and laws in the process of language acquisition, and provide scientific basis for personalized teaching [6]. Therefore, exploring AI-based language acquisition pattern recognition not only has theoretical significance, but also has broad application prospects in educational practice.

The purpose of this study is to explore how to use AI technology to identify and analyze language acquisition patterns, and further explore how these patterns can guide the formulation and implementation of personalized teaching strategies. Specific research purposes include:

(1) Combing and summarizing the existing theories and models of language acquisition, and analyzing their advantages and disadvantages, so as to provide theoretical support for AI-based recognition methods.

(2) Explore the application of AI technology in the collection, processing and analysis of language acquisition data, and construct the recognition framework of language acquisition patterns.

(3) Based on the recognized language acquisition mode, design and implement personalized teaching strategies, and evaluate their effectiveness and feasibility.

(4) Reflect on the challenges and limitations of AI-based language acquisition pattern

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recognition and personalized teaching strategies, and put forward the future research direction.

2. Language acquisition pattern recognition and AI

2.1. Traditional perspective and classification of language acquisition model

Traditional research on language acquisition mode is mainly based on behaviorism and cognitive theory [7]. Behaviorism emphasizes that language acquisition is a process of imitation and habit formation, while cognitivism pays more attention to learners' internal cognitive mechanism and language processing ability [8]. On this basis, language acquisition models can be divided into two categories: natural acquisition and teaching acquisition. Natural acquisition refers to the process that learners acquire language through natural interaction and contextual contact in daily life, while teaching acquisition emphasizes language acquisition through planned guidance and practice in language teaching environment.

Furthermore, the language acquisition model can be subdivided according to the individual differences of learners, learning environment and learning strategies, as shown in Table 1. In addition, the different learning environments will also affect the language acquisition mode, for example, there may be significant differences between the immersion learning environment and the non-immersion learning environment.

Table 1 Subdivision of Language Acquisition Modes

Dimension	Subtypes	Description
Learner Individual Differences	Age	Children, Adolescents, Adults, etc.
	Learning Ability	Efficient Learners, Average Learners, Learners with Difficulties
	Learning Style	Auditory, Visual, Kinesthetic, etc.
Learning Environment	Natural Environment	Family, Community, Workplace, etc.
	Instructional Environment	Classroom, Online Courses, One-on-One Tutoring, etc.
	Social Environment	Language Exchange Groups, Language Corners, International Exchange Events, etc.
Learning Strategies	Imitation and Repetition	Consolidating language skills through imitation and repetition
	Contextualized Learning	Applying language in real-world contexts to improve comprehension
	Autonomous Learning	Learners independently devise learning plans and choose learning resources
	Collaborative Learning	Learning with others, enhancing language skills through interaction and feedback

2.2. The role of AI in language acquisition pattern recognition

With the rapid development of AI technology, its application in language acquisition pattern recognition is increasingly extensive. AI technology can process and analyze massive data and reveal complex patterns and laws in the process of language acquisition [9]. Through algorithms such as machine learning and deep learning, AI can comprehensively analyze learners' language input, output and interaction behavior, so as to identify different language acquisition modes. Specifically, the role of AI in language acquisition pattern recognition is mainly reflected in the following aspects:

(1) Improving the ability of data collection and processing: AI technology can automatically collect and process large-scale language acquisition data, including learners' language input, output, interactive behavior, etc., and provide a rich data base for the identification of language acquisition patterns.

(2) In-depth understanding of learners' behavior and learning process: Through machine learning and deep learning algorithms, AI can model and predict learners' language acquisition process, reveal the similarities and differences of different learners in the process of language acquisition, and provide scientific basis for the formulation of personalized teaching strategies.

(3) Establishment of real-time feedback and adjustment mechanism: AI technology can monitor learners' language acquisition process in real time, and provide personalized feedback and

adjustment suggestions according to the identified language acquisition patterns to help learners acquire languages more effectively.

To sum up, AI plays an important role in language acquisition pattern recognition, which provides strong support for the formulation and implementation of personalized teaching strategies.

3. Theory and practice of individualized teaching strategy

3.1. Theoretical basis of individualized teaching strategy

Personalized teaching strategy is based on the theory of individual differences of learners [10]. This theory emphasizes that every learner is unique, and they have different language talents, learning motivations, learning styles and cognitive styles. Therefore, teaching strategies should be customized according to the different characteristics of individuals to meet the unique needs of learners. Personalized teaching strategies also draw lessons from the principle of matching teaching strategies with learning styles, and think that when teaching strategies match learners' learning styles, the learning effect will reach the best.

3.2. Development and implementation of personalized teaching strategies

Making individualized teaching strategies requires a comprehensive analysis of learners' characteristics. This includes evaluating learners' language ability, learning motivation, learning style and cognitive style. Based on these analyses, teachers can set individualized teaching objectives for learners and choose suitable teaching contents and methods, as shown in Figure 1.

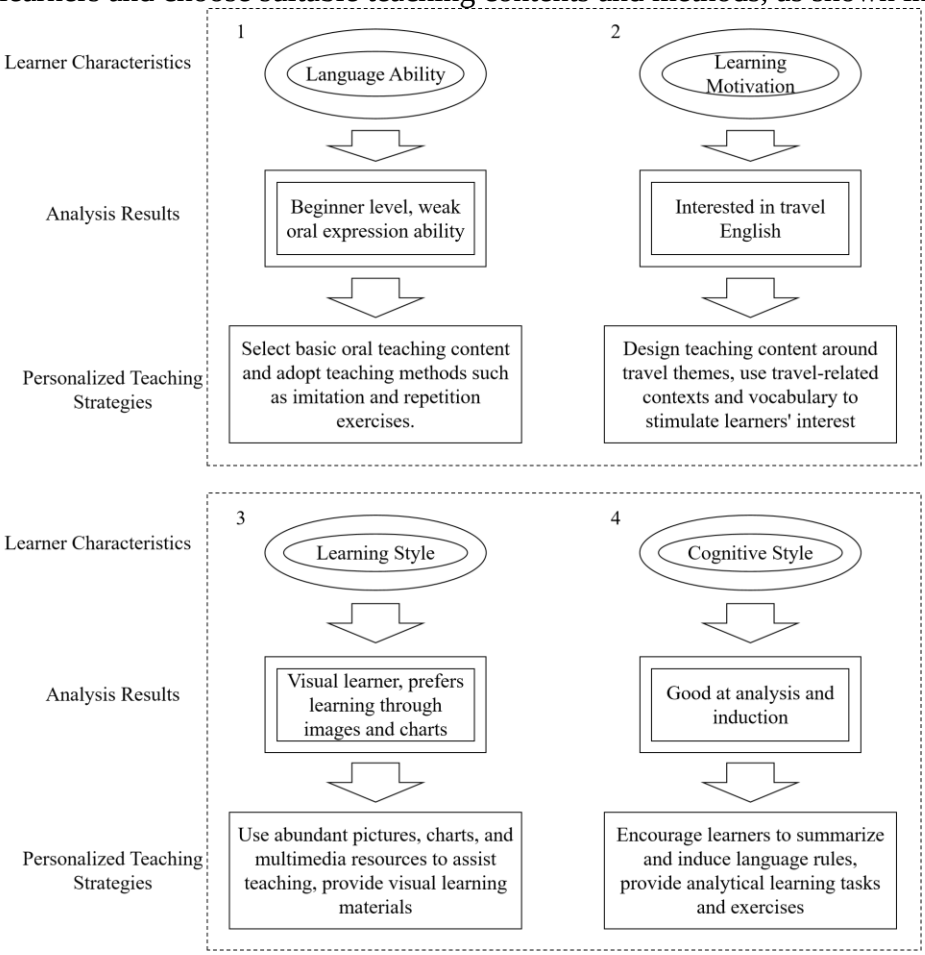

Figure 1 Example of individualized teaching strategy formulation

When implementing personalized teaching strategies, teachers need to flexibly adjust teaching strategies to adapt to the changes of learners. This includes timely adjustment of teaching objectives, contents and methods according to learners' progress and feedback. At the same time, teachers also need to provide learners with personalized learning resources and support, such as customized

learning plans, personalized learning materials and one-on-one counseling.

Personalized teaching strategies have been practiced in many educational environments. For example, on some language learning platforms, learners can choose their own learning paths and resources according to their learning needs and styles. These platforms recommend personalized learning content and exercises through algorithms to help learners improve their language ability more effectively.

4. The application of AI in personalized teaching strategy

4.1. Allocation of teaching resources supported by AI technology

AI technology plays an important role in personalized teaching strategies, especially in the allocation of teaching resources. The traditional allocation of teaching resources is often based on unified standards and fixed models, and it is difficult to meet the unique needs of each learner. AI technology can recommend personalized learning resources for learners according to their individual differences and learning needs through intelligent recommendation system. These resources can include learning materials, exercises and online courses suitable for learners. Through intelligent recommendation, learners can obtain useful resources more efficiently and improve their learning effect.

4.2. Real-time feedback and adjustment promoted by AI

AI technology can also realize real-time feedback and adjustment, which is an important link in personalized teaching strategies. Traditional teaching feedback often depends on teachers' observation and evaluation, but this method may be subjective and lagging. AI technology can provide personalized feedback and suggestions in time by monitoring learners' learning behavior and data in real time. For example, when learners encounter difficulties at a certain language point, AI system can immediately provide relevant explanations and exercises to help learners correct their mistakes in time and deepen their understanding. At the same time, the system can also adjust teaching strategies according to learners' progress and feedback to ensure that teaching always matches learners' needs.

4.3. The integration practice of AI and personalized teaching strategy

The integration of AI technology and personalized teaching strategies has been practiced in many educational scenes, as shown in Table 2.

Table 2 Examples of the Integration of AI Technology and Personalized Teaching Strategies in Educational Settings

Educational Setting	Application of AI Technology	Personalized Teaching Strategies	Practical Effects
Online Learning Platform	Learning data analysis, intelligent recommendation system	Recommend personalized learning resources based on learners' history and progress	Improve learning efficiency, reduce ineffective learning time
Intelligent Tutoring System	Speech recognition and synthesis, natural language processing	Provide targeted reinforcement training for learners' weak areas through conversational tutoring	Enhance learning interactivity, effectively improve learning outcomes
Smart Classroom	Facial expression recognition, sentiment analysis	Real-time monitoring of learners' emotional changes, adjustment of teaching content and pace	Create a positive learning environment, increase learner engagement and satisfaction
Adaptive Learning System	Machine learning algorithms, knowledge graphs	Dynamically adjust difficulty and learning paths based on learners' mastery, achieving personalized learning paths	Optimize learning paths, ensure learners grow through appropriate challenges
Virtual Teaching Assistant	Voice interaction, intelligent Q&A	Provide 24/7 online Q&A services, answer learners' questions	Meet learners' needs at any time, enhance the sense of learning support

Based on these analyses, the system can provide customized learning paths and resource

recommendations for learners. At the same time, the system can also monitor learners' learning progress and performance in real time, and make adjustments and optimizations as needed. These practical examples show the wide application of AI technology in the field of education, and how to meet the needs of different learners through personalized teaching strategies, so as to improve the teaching effect and learning experience.

5. Conclusions

This study deeply discusses the theory and practice of language acquisition pattern recognition and personalized teaching strategies, aiming at revealing how to use AI technology to optimize the language teaching process. Through systematic analysis and discussion, this study draws the following main points:

First of all, language acquisition is a complex and multidimensional process, involving many modes and influencing factors. Through the application of AI technology, we can collect and analyze language acquisition data more comprehensively, so as to identify learners' language acquisition patterns more accurately. This provides a scientific basis for the formulation of personalized teaching strategies. Secondly, personalized teaching strategy is an important way to improve the effect of language teaching. By customizing teaching strategies according to learners' individual differences and learning needs, we can better meet learners' unique needs, stimulate their learning motivation and promote their all-round development of language ability. Finally, AI technology has great application potential in the field of education. This study shows the important role of AI in language acquisition pattern recognition and personalized teaching strategy formulation, which provides beneficial enlightenment for future educational practice.

Theoretically, this study enriches the theoretical system of language acquisition mode and personalized teaching strategy, and provides a new perspective and train of thought for the follow-up research. From the practical point of view, this study provides useful enlightenment and guidance for educational practice. Through the formulation and implementation of personalized teaching strategies, teachers can better understand learners, meet their unique needs, and promote their overall language ability.

References

[1] Zhang Zerui, Liu Bin. Development opportunities and practical paths of personalized teaching in the era of artificial intelligence [J]. Gansu Education Research, 2023(11):120-123.

[2] Li Luliang. Research and innovation of language interaction in second language acquisition mode [J]. Journal of Huaihai Institute of Technology (Humanities and Social Sciences Edition), 2019, 17(02):59-61.

[3] Fang Bing. Exploration and research on the effect of interactive mode on second language acquisition [J]. Journal of Shenyang Agricultural University: Social Science Edition, 2023, 25(1):111-116.

[4] Liang Aimin. Research on foreign language teaching and evaluation model from the perspective of social and cultural language acquisition [J]. Examination and Evaluation (College English Teaching and Research Edition), 2018, 97(06):23-27.

[5] Fang Fang. Research on the influence of CBI teaching philosophy on language learners' motivation factors [J]. Education and Teaching Forum, 2018, (039):172-174.

[6] Lu Jun. On the Enlightenment of Second Language Acquisition Theory on the Teaching Mode of Newspaper Reading for English Majors [J]. University, 2021,(21):70-72.

[7] Yu Jingyang, Deng Juan. On the three-dimensional coupling interaction model of second language Chinese vocabulary acquisition [J]. Journal of Liaoning Normal University (Social Science Edition), 2024, 47(1):26-32.

[8] Wu Xi. A Study of Foreign Language Classroom Teaching Mode from the Perspective of Eco-linguistics [J]. Chinese Journal, 2022, 42(5):119-124.

[9] Wu Yingfang. Exploring the Cognitive Model of Vocabulary Acquisition Based on Textbooks [J]. Journal of Jixi University, 2013,13(02):73-75.

[10] Liao Minhui. Study on College Students' English Vocabulary Acquisition Mode under the Principle of Learning with Use [J]. Fujian Tea, 2019,41(10):124-125.