

# Research on the influencing factors of the college students' autonomous English learning adaptability under the background of artificial intelligence

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**Abstract:** This study aims to sort out the adaptive structure of college students' autonomous English learning supported by mobile technology under the background of artificial intelligence, and build a model of influencing factors of college students' English learning adaptability under the support of artificial intelligence, so as to provide theoretical support for effectively improving of students' intelligent learning adaptability. Based on the autonomy and interactivity of English learning supported by artificial intelligence and the constructive learning theory, the study determined that the English learning adaptability of college students supported by artificial intelligence mainly consists of five aspects: learning attitude adaptation, autonomous learning ability adaptation, learning interaction adaptation, learning environment adaptation and physical and mental health adaptation. By sorting out the main factors affecting learning adaptability in the information learning environment, combining the importance of intelligent literacy in the intelligent environment, the current situation of artificial intelligence supporting English learning and Bandura's social learning theory, this study determined that the factors influencing college students' English learning adaptability under the support of artificial intelligence included learning motivation, intelligent literacy, self-learning efficacy, teacher support and resource platform. The results show that learning motivation, intelligence literacy, learning self-efficacy and resource platform have significant direct and positive effects on learning adaptability. According to the survey results, in order to improve the adaptability of college students' English learning with the support of artificial intelligence, the author proposes to improve their autonomous learning ability and intelligent literacy at the individual level, actively adapt to intelligent education at the teacher level and carry out personalized teaching intervention on students' learning, and propose resource optimization and the principle of "moderation" at the resource level.

**Keywords:** artificial intelligence; learning adaptability; College students' autonomous learning; mobile technology

## 1. Introduction

The acceleration of the iterative update of science and technology has accelerated the process of the transition from the information age to the intelligent age, and the society has entered a new era of intelligence and information. The development of technology in the new era has acted on the field of education, changing the traditional education idea, innovating the education model and optimizing the teaching method. The purpose of educational reform is to promote the improvement of education, and the rational use of technology to accelerate the development of education is an inevitable trend of educational reform and innovation in the new era. At present, modern information technology led by artificial intelligence technology is playing a role in English learning. Based on artificial intelligence technology, students' English level is personalized and accurately tested, helping students to correct pronunciation in time, tracking and accurately recording students' learning behavior data, and then promoting learning efficiency through scientific digital portrait analysis<sup>[1]</sup>. AI-supported learning has become the forefront of current English education informatization research, trying to change the traditional teaching mode through artificial intelligence technology, improve the teaching quality of teachers, so that students can get a better learning experience and promote their quality of English learning.

Learning adaptability, as one of the important indicators to measure students' learning effect, is the key to determine the quality of learning<sup>[2]</sup>. Many studies have shown that good learning adaptability is an important guarantee for students to achieve better academic performance, and learning adaptability

has a significant positive predictive effect on academic performance. On the contrary, poor learning adaptability may lead to the decline of interest, lack of motivation, emotional instability, and lack of confidence, which will affect the normal development of students' studies and healthy growth of body and mind. Educational psychology research shows that learning adaptability is a universal problem, and there is a learning adaptability problem through any kind of teaching organization, even if it is used for hundreds of years of class teaching, not all learners are adapted. The integration of artificial intelligence and English education has brought about changes in English teaching environment, teaching content, teachers' teaching mode and students' learning mode<sup>[3]</sup>. For college students, participating in English learning supported by artificial intelligence is still a new experience, and they need to adapt to the new learning environment and new learning methods, as well as master new learning methods, so as to ensure the good development of their English scores in the intelligent learning environment.

At present, artificial intelligence supporting English learning is in the process of continuous development, and relevant research is in full swing. Meanwhile, the functional diversification of artificial intelligence support English learning is initially realized, and the application scenarios are fully covered, and it has been widely recognized by many students and teachers in practical application. Relevant studies have found that in English teaching and learning, artificial intelligence has been highly effective in individual assisted writing, human-computer dialogue writing, machine automatic writing, and group cooperation, and has improved the efficiency of learning, teaching, auxiliary, testing, and evaluation, and the application of artificial intelligence in teaching can stimulate students' learning drive, strengthen the guiding role of teachers, and thus improve the quality of teaching. At the same time, some studies have found that with the development of English learning practice supported by artificial intelligence, there is also a certain degree of maladaptation to learning, such as the lack of participation of some students in intelligent speech learning, the maladaptation of independent learning strategies, and the poor adaptability to English resources and platforms<sup>[4]</sup>. These problems directly affect the effect and quality of students' English learning, affect the effectiveness of artificial intelligence to enable English learning, and are not conducive to the development of students' psychological quality under the environment of intelligent education. Therefore, it is necessary to further explore the adaptability of students' English learning under the support of artificial intelligence, so as to improve students' learning adaptability and learning quality under the support of artificial intelligence.

## **2. Adaptive variables and influencing factors of college students' English learning with the support of artificial intelligence mobile technology**

### ***a. Learning adaptive variables***

As for the measurement of college students' English learning adaptability under the support of artificial intelligence, this study mainly refers to Zhou Bucheng's "Learning Adaptability Detection" and proposes that the English learning adaptability of college students under the support of artificial intelligence is composed of five dimensions: learning attitude adaptation, autonomous learning ability adaptation, learning interaction adaptation, physical and mental health adaptation, and learning environment adaptation<sup>[5]</sup>. Learning attitude is the learner's view of the activity itself and their own words and deeds in the learning activity. In psychology, learning attitude is a relatively stable internal psychological tendency shown by learners in learning, which mainly consists of three elements: emotional, cognitive and behavioral tendency. As the emotional factor of learning, learning attitude is the emotional experience of college students on learning itself and learning situation on the basis of cognition, and plays an important role in learning adaptation.

Independent learning ability is the ability to take charge of one's own learning, which is the integration of multiple abilities, including critical thinking, decision-making ability, independent action and so on. In the artificial intelligence learning environment, the education concept has changed from "teacher-centered" to "student-centered". Compared with traditional teaching, it gives students more autonomy, but also requires students to have stronger initiative, take the initiative to build knowledge, and obtain effective learning. In AI-supported learning, AI tools, as learning resources, teachers, learning peers, learning management and other multiple roles, cooperate with people to learn, and there are "student-intelligent machine" learning forms in concrete practice teaching, and "student-teacher-intelligent machine" learning forms, interaction in learning<sup>[6]</sup>. It includes not only teacher-student interaction, peer (classmate) interaction, but also interaction with the machine, that is, human-computer interaction. Learning environment is the place where learning takes place and the external conditions that promote learners to actively construct knowledge meaning and ability

generation. Physical and mental health mainly refers to two aspects: physical health and mental health. In the learning process, students' physical health is the premise to support the smooth completion of learning, and mental health is the guarantee of stable learning process.

#### ***b. Influencing factors of learning adaptability***

This study concludes that the main factors affecting students' learning adaptability include internal factors, such as learning motivation, information literacy, and learning self-efficacy, and external factors, such as teacher support and resource platform<sup>[7]</sup>. According to the different objects of study, learning environment, learning style and so on, there are some different factors affecting students' learning adaptability.

Learning motivation is the internal push to promote the development of learning activities, and is the emotional factor that stimulates learners' learning behavior and guides and maintains learning behavior. In the intelligent society, individual intelligence literacy is the key ability to adapt to the development of intelligent society and cope with the challenges of intelligent society in the future. In this study, intelligent literacy refers to students' intelligence literacy. Derived from Bandura's self-efficacy, learning self-efficacy is learners' subjective ability to predict and value judge whether they can complete learning tasks. It has been found in practical teaching that in intelligent collaborative systems, teachers' recognition of intelligent writing systems will stimulate students' motivation to continue to use them. Moreover, in AI-supported learning, teachers still need to provide guidance, and teachers are still the leaders of teaching. Resource platform refers to a resource platform that provides English learning materials and artificial intelligence for learning environment. There are mainly network platform, application software, intelligent hardware, etc., which are the objects that students can directly operate and apply in the learning process.

### **3. Strategies for improving college students' English learning adaptability with the support of artificial intelligence**

Through the analysis of the English learning adaptability of college students supported by artificial intelligence and the relationship between the influencing factors, it is understood that the learning adaptability of college students supported by artificial intelligence in English learning is at a medium level, the learning adaptability of students in all aspects needs to be improved, and there are complex structural relationships among the influencing factors of learning adaptability<sup>[8]</sup>. According to the research results, with the goal of improving the adaptive level of college students' English learning under the support of artificial intelligence, combined with constructive learning theory and social learning theory, this study puts forward corresponding strategies from the level of individual students, teachers and resources.

#### ***a. Individual level: independent learning ability and intelligent literacy improvement***

In the learning environment supported by artificial intelligence, with the teaching concept of "learner-centered" and relying on artificial intelligence technology, students are transformed from the original "knowledge recipients" to "knowledge builders", truly realizing the transformation from "educated" to "learners", so that students have more freedom and autonomy. When students gain more freedom, autonomy and individuation, they are also required to adapt their autonomous learning ability level to intelligent learning in order to achieve effective development. Therefore, the better self-learning ability of college students is the key to promote the development of students' intelligent learning and realize the role transformation of college students from "educatee" to "learner". The adaptability of students' self-learning ability is an important content of students' learning adaptability. To improve students' autonomous learning ability, first of all, we should strengthen the awareness of autonomous learning. At the university stage, teachers no longer carry out indoctrination education and track the whole process of students' learning, but as the guide of learning, students need to consciously and actively explore the acquisition of knowledge<sup>[9]</sup>. The traditional "teacher-centered" classroom is deeply rooted in the hearts of the people, and students' awareness of independent learning and active problem solving is weak, while the learning environment supported by artificial intelligence is based on the teaching concept of "student-centered", knowledge acquisition is constructed by students actively, and students are required to have a certain ability of independent learning. Therefore, in order to adapt to the learning form of the new era, students must realize the importance of independent learning, establish a sense of independent learning, fundamentally overcome the psychological dependence on teachers, and clearly realize that independent learning is not learning alone, but independent thinking, independent development of learning goals and choose learning methods. "Combined with their own

learning interests and needs, develop learning goals, with the help of artificial intelligence English learning tools, plan the path of learning, self-management and monitoring, through man-machine collaboration, gradually strengthen the individual's awareness of independent learning."

The improvement of students' intelligence literacy can not only enhance the objective evaluation of AI English learning tools to a certain extent, but also improve students' ability to control the AI English learning resource platform. The cultivation of artificial intelligence literacy of college students cannot be separated from the direct education of schools. The university offers public basic courses of artificial intelligence to guide students to understand knowledge and applications related to AI, stimulate students' curiosity and interest in artificial intelligence, and enable students to form intelligent consciousness. Moreover, teachers, as the practitioners of intelligent education, are also the guides of students' intelligent literacy. Teachers integrate "artificial intelligence" into English classroom teaching, drive students to apply artificial intelligence learning tools to complete learning tasks, promote students' intelligence application level through practice, and help students establish correct intelligent ethics, so as to improve students' intelligence literacy level.

***b. Teacher level: active adaptation and individualized teaching intervention***

"Artificial intelligence will not replace teachers, but teachers who use artificial intelligence will replace teachers who do not use artificial intelligence," human-machine collaboration is the trend of future education development. Artificial intelligence can improve teachers' teaching efficiency and help teachers carry out personalized teaching. Only by actively adapting and full preparation, can teachers cope with the challenges of artificial intelligence and adapt to the future education form of man-machine collaborative work.

Teachers should take the initiative to adapt to the transformation of their role as mentors and guides in the era of artificial intelligence. Teachers take the initiative to adapt to the teaching in the era of artificial intelligence. First, they should establish the educational concept of "learner-centered", and conduct teaching design guided by the educational concept of "learner-centered", and innovate the teaching mode. Secondly, they should take the initiative to accept and make objective evaluation. In learning, students have the characteristics of imitating teachers, and their learning behaviors and styles are influenced by teachers. Therefore, teachers are required to "set a good example for others". Teachers should first adapt to the teaching form of artificial intelligence, and their acceptance, skilled use and good evaluation of artificial intelligence teaching tools will affect students' subjective evaluation of artificial intelligence learning, attract students' attention to artificial intelligence learning tools, which will stimulate their learning motivation, and further improve their learning adaptability. Third, teachers should take the initiative to improve their own intelligent educational literacy. Teachers' intelligent educational literacy means that they can master basic artificial intelligence knowledge and principles, make reasonable judgments on the educational value of artificial intelligence, use artificial intelligence to improve subject ability and teaching ability, and carry out teaching with artificial intelligence. Teachers should actively and consciously participate in teacher education and training, make full use of the Internet platform to observe excellent teaching cases, actively participate in artificial intelligence teaching competitions, enrich their own artificial intelligence knowledge, create "artificial intelligence +" discipline teaching mode, and improve intelligent education quality in practice.

***c. Resource level: Resource optimization and the principle of "moderation"***

Learning takes place in a certain environment, and learning resources, as the learning environment, have an important direct effect on students' learning adaptability. High-quality learning resources can bring better learning experience to students, enhance their perceived usefulness and perceived ease of use of resources, that is, improve students' acceptance, so as to achieve better learning results. In addition, high-quality learning resources can attract the attention of students, stimulate the motivation of learning, and promote the appropriate improvement of learning. At present, there are a large number of English learning resources based on artificial intelligence technology, whose functions and positioning are different, showing the phenomenon of excessive resources and uneven quality, which increases the difficulty of students and scholars choosing resources that adapt to their own learning needs to a certain extent. For students, the more simple and convenient the operation, the more applicable the learning content, the easier it is to be accepted. Therefore, in the design and development of learning resource platform, students' perception should be taken as an important reference project, and the content of learning resources should adapt to students' cognitive development. Too simple or difficult learning content will not be suitable for students' development. All in all, the principle of "moderation" should be followed in the development of resource platforms.

#### 4. Conclusion and Prospect

For a long time, the research on artificial intelligence supporting English learning at home and abroad has never stopped in the "technical exploration", and in recent years, the research has gradually paid attention to the "teaching practice", and paid more and more attention to the effectiveness of artificial intelligence in English education and the use of teachers and students. At present, the practice of artificial intelligence supporting college students' English learning has achieved important results, and at the same time, a certain degree of poor learning adaptability has been found. The learning adaptability of college students is not only related to the quality of learning, but also affects the performance of learning supported by artificial intelligence to some extent.

Learning supported by artificial intelligence is the inevitable trend of future education development, and students' learning adaptability is the key to students' academic development and the performance of artificial intelligence. This study on the adaptability of college students' English learning under the support of artificial intelligence is a preliminary study on the adaptability of students' learning in AI-supported education and teaching. This study discusses the impact on learning adaptability from five aspects, such as learning attitude and intelligent literacy, while other dimensions are not involved. We hope that more research and practice can explore more effective strategies to support college students to improve their self-learning empowerment and promote the innovation and development of college foreign language education as well.

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