Region - Educational Research and Reviews, 2025, Volume7, Issue1
DOI: 10.32629/rerr.v7i1.3576
ISSN Online: 2661-4634
ISSN Print: 2661-4626

The role of science and technology in improving the college English learning ability

Ping CHEN

Chongqing Vocational and Technical University of Mechatronics, Chongqing 402760, China

Abstract: With the rapid development of information technology, science and technology has been deeply integrated into every link of English teaching, and has become an important means to improve the college English learning ability. The application of science and technology plays an important role in broadening learning channels, breaking through the limitation of time and space, realizing personalized learning and optimizing the monitoring of learning process, as well as promoting the reform of college English teaching mode. Colleges and universities should follow the trend of educational informatization, integrate high-quality teaching resources, build intelligent learning platforms, deeply apply artificial intelligence technology, construct virtual simulation environment, and apply mobile learning platform to improve the English learning ability of college students in multiple dimensions, and cultivate international compound talents.

Key words: science and technology; college English; learning ability and application strategy

1 Introduction

As an international common language, the importance of English has become a global consensus. In China, English teaching has always been a key area of higher education. However, the traditional English teaching mode has exposed many deficiencies in the information age, which is difficult to meet the needs of cultivating international talents. With the rapid development of modern information technology, it has become an important trend in the field of English education to introduce scientific and technological means into English teaching and utilize its convenience and interactivity to improve the teaching effect. So, how does the application of science and technology affect college students English learning ability? How should colleges and universities use scientific and technological means to comprehensively improve the quality of college English teaching? This is the core issue to be explored in this paper.

2 The influence of technology application on college English learning ability

2.1 Expand learning channels and provide rich learning resources

The Internet technology has broken the space-time boundary of the traditional classroom, making the acquisition and dissemination of learning resources more convenient. Students can use online platforms, such as MOOCs and micro-courses, to independently obtain rich and high-quality English learning resources. Video, audio, e-books and other multimedia learning content can meet students' diversified learning needs and stimulate their interest in learning. In addition, students can also have cross-cultural communication with native English speakers through the Internet, so as to improve their language proficiency in a real language environment. This kind of immersive and cross-cultural language

learning is unattainable in traditional classrooms. For example, students can make friends from English-speaking countries through social networking platforms, conduct regular video dialogues, and learn authentic English expressions in a relaxed and pleasant atmosphere. Massive online English learning resources have created a good independent learning environment for students, and effectively broadened the learning channels [1].

2.2 Break through the limitation of time and space and create an immersive learning environment

English learning requires a large amount of language input and output, and it is difficult to meet the learning needs simply by relying on classroom teaching. Modern technological means, such as intelligent speech recognition, natural language processing, virtual reality, etc., provide the possibility to create an immersive English learning environment. Students use the intelligent voice system to conduct oral English training anytime and anywhere, and can get immediate feedback to understand their own shortcomings in pronunciation, intonation and other aspects. Virtual reality technology can also construct realistic language scenes, and students can strengthen their pragmatic ability in the interaction with virtual characters. This immersive experience can effectively mobilize students' various senses and make them devote themselves to language learning. For example, students can use the VR headset to enter virtual English teaching or job interview situation, and conduct language training in a simulation environment. The immersive language environment created by science and technology breaks through the limitations of classroom time and space, allows students to study independently in an immersive atmosphere, and significantly improves the learning effect.

2.3 Realize personalized learning to meet the differentiated needs of learners

One of the challenges of college English teaching is that students have different English foundation, and it is difficult to meet the learning needs of each student with the "one size fits all" teaching model. Modern scientific and technological means, especially the development of artificial intelligence technology, make personalized learning possible. The intelligent system can track and analyze students' learning behavior, draw the learning curve, and push personalized learning content accordingly. This precise teaching mode can fully respect students' individual differences and teach students according to their aptitude. For example, for students with low vocabulary, the system will focus on pushing the vocabulary learning content; while students with good grammar knowledge will moderately increase the grammar difficulty. Personalized learning resource push can help students make up for their shortcomings, stimulate their learning motivation and mobilize their enthusiasm for learning.

2.4 Optimize the monitoring of the learning process, and scientifically guide the independent learning

Relying on big data technology, the intelligent teaching platform can realize data collection and intelligent analysis of the whole process of students learning, and evaluate students' learning status from multiple perspectives of learning effect, learning behavior and other dimensions. The platform will diagnose students' learning situation according to the learning data, find out the problems existing in the learning process, and give targeted learning suggestions to help students optimize their learning plans. Students can also timely grasp their learning progress through data analysis, and fill the gaps. Rich and diverse data visualization forms, such as learning progress bars, ability radar charts, etc., can intuitively present students' learning effect, facilitating self-monitoring and adjustment.

3 Application strategies of scientific and technological means in improving college English learning ability

3.1 Integrate high-quality teaching resources and build a smart learning platform

Colleges and universities should seize the opportunity of the development of information technology, and make full use of cloud computing, big data and other technical means to integrate diverse high-quality English teaching resources, and build an intelligent learning platform integrating teaching, learning, management and service. This platform should be

based on meeting the actual needs of teachers and students, and provide all-round support for improving the quality of college English teaching. In terms of teaching resources, the platform should cover online courses, micro-course videos, electronic textbooks and other forms of digital resources, so as to achieve rich content and diverse forms. These resources should highlight the characteristics of English subjects, and take into account the cultivation of various language skills of listening, speaking, reading, writing and translation, so as to meet the needs of students to comprehensively improve their English proficiency. At the same time, colleges and universities should pay attention to the selection and integration of high-quality resources, and through the cooperation with well-known universities and educational institutions, we should introduce first-class teaching resources at home and abroad to ensure the quality of resources [2].

In the design of the platform function, the student-centered teaching concept should be reflected. The platform should provide teachers with online tools such as online lesson preparation and online teaching, and support teachers to independently develop personalized teaching space. Teachers can flexibly organize teaching activities on the platform, track students' learning dynamics in real time, and carry out in-depth interaction and communication with students. For students, the platform should provide self-directed learning, online evaluation, learning process monitoring and other functions to help students clarify their learning objectives and optimize their learning paths. Students can use the platform to study independently, participate in online discussions, share their learning experiences, and improve their English learning ability in collaboration and interaction. At the same time, the platform should also embed learning process monitoring and analysis tools, use big data technology to track and analyze students' learning behavior, and provide students with personalized learning resource push and learning suggestions.

The "Foreign Research Institute" intelligent teaching platform launched by Foreign Language Teaching and Research Press is an early English teaching platform explored in China. It integrates massive teaching resources and online learning tools, and is a model of intelligent learning platform in universities. The platform has built a comprehensive English teaching and learning ecosystem from the dimensions of teaching material content, classroom teaching and online learning. In terms of resource construction, the platform provides online courses and supporting micro-courses that are deeply integrated with the textbooks of FTRP, realizing the co-construction and sharing of high-quality teaching resources. In terms of teaching application, teachers can use the platform to carry out the teaching links such as lesson preparation, teaching, homework, testing and so on, and flexibly organize the online and offline mixed teaching. Students can use the platform to preview before class and review after class, and participate in the online learning activities organized by teachers, which significantly improves the initiative and participation in learning. In addition, the platform also embedded functional modules such as learning process monitoring, learning situation analysis and so on, which provided strong support for promoting personalized teaching.

3.2 Deep application of artificial intelligence technology to achieve precision teaching

Artificial intelligence, as a strategic technology leading a new round of scientific and technological revolution and industrial revolution, is setting off a profound change in the field of education. The deep integration of artificial intelligence into college English teaching can bring new breakthroughs in improving the teaching quality and learning effect. Artificial intelligence technology, with its intelligent, personalized and accurate characteristics, has provided a strong support for the realization of teaching students in accordance with their aptitude and promoting personalized learning. Colleges and universities should conform to the development trend of the intelligent era, accelerate the application of artificial intelligence in all aspects of English teaching, and use intelligent technology to empower English education and teaching.

The core application value of artificial intelligence lies in the realization of precision teaching. Based on natural

language processing, knowledge mapping and other technologies, the intelligent teaching system can make a comprehensive analysis of students' learning behavior and learning effect, and draw a learning situation portrait, so as to push personalized learning content for each student. For example, using natural language processing technology, the system can carry out real-time speech recognition and semantic understanding of students' oral expression, diagnose students' problems in pronunciation, intonation, grammar and other aspects, and provide targeted training feedback. Combined with knowledge mapping technology, the system can present the vocabulary and grammar knowledge of students in a network, and intelligently recommend matching learning resources to help students find out the omissions and fill the gaps. Applying artificial intelligence to online assessment can realize the multi-dimensional dynamic assessment of students' English ability. The system excavates and analyzes the data of students' learning process, dynamically adjusts the difficulty of the questions, and generates a personalized learning report, which directly reflects the development of students' language ability.

For teachers, artificial intelligence is an effective teaching assistant, which can significantly improve the intelligent level of teaching management and teaching decision-making. Teachers can use the whole-process record data provided by the intelligent system, analyze the characteristics of students' learning behavior from multiple angles, diagnose the common problems, and adjust the teaching strategies accordingly. For example, by analyzing students' online learning behavior, teachers can understand their mastery of knowledge, and organize targeted classroom teaching activities. For students with a weak foundation, personalized learning promotion plans can be formulated. This accurate decision-making supported by massive teaching data can greatly improve the pertinence and effectiveness of individualized teaching.

3.3 Build a virtual simulation environment and strengthen the situational simulation training

Language learning requires a lot of situational training. Virtual reality, augmented reality and other technologies provide strong support for the construction of an immersive language learning environment. Schools can use VR and AR technology to develop English scenario simulation software, so that students can play roles in virtual scenes and strengthen their language use ability. For example, students can use English to complete communication tasks in a simulated job interview, business negotiation and other scenarios. Virtual characters can also give ratings and feedback on students' performance to help students improve in time. The immersive language practice can effectively stimulate students' interest in learning and improve the learning effect. In addition, universities can also cooperate with foreign universities to use virtual classrooms to carry out cross-cultural exchanges, so that students can interact with foreign students in real time and enhance cultural understanding. For example, the full-English discussion course, jointly established by the Foreign Language Department of Tsinghua University and the University of California, Berkeley, has used the virtual classroom platform to enable Chinese and American students to "communicate face to face", and achieved good results. With the development of 5G and other new generation of information technology, virtual simulation English teaching will usher in a broader application prospect [3].

3.4 Application of mobile learning platform to promote ubiquitous learning

Mobile learning is becoming an important form of English learning for college students. The popularity of smart phones, tablet computers and other mobile terminals enables learning to happen anytime and anywhere. Various kinds of English mobile learning APPs have sprung up, such as scallop words, fluent English speaking, which provide strong support for improving the college English learning ability. These apps integrate functions such as vocabulary memory, reading comprehension,English speaking and reading to support personalized learning and are favored by students. Colleges and universities can guide students to use the fragmented time to study independently through the APPs. Teachers can also rely on the mobile learning platform to arrange teaching tasks, organize discussion and communication, and

achieve interaction with students anytime and anywhere. For example, teachers can start a topic discussion on the APP and guide students to comment on current events in English. This kind of extended learning based on the mobile learning platform breaks through the boundary of time and space in the classroom and integrates English learning into students daily life. Mobile learning is promoting the reform of college English teaching mode, and is an important way to realize the generalization and personalized learning. In the future, universities should further explore the application mode of mobile learning and explore its unique value in improving the effect of college English teaching.

4 Conclusion

The rapid development of science and technology has brought new opportunities and challenges to the reform of college English teaching. Integrating modern information technology deeply into English teaching can effectively improve the English learning ability of college students. Based on the needs of cultivating international talents, universities should integrate high-quality teaching resources, build intelligent learning platforms, deeply apply artificial intelligence technology, construct virtual simulation environment, and promote mobile learning mode, so as to create a good personalized, intelligent and immersive learning atmosphere for students. At the same time, it is also necessary to strengthen the training of teachers' information teaching ability, constantly update their educational concepts and teaching modes, and promote the deep integration of science and technology and English teaching. It is believed that with the power of modern science and technology, college English teaching will be full of vitality and lay a solid foundation for students' comprehensive and future development.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Porto M, Houghton SA, Zhao W. 2023. Exploring college English teaching of rhetorical knowledge: a legitimation code theory analysis. *Language Teaching Research*, 27(2): 394-414.

[2] Gao S. 2023. Research on the Strategy and Effect of Integrating Ideological and Political Education into College English course in higher vocational colleges. *Contemporary Education & Teaching Research*, 4(8): 26-30.

[3] Wang J. 2024. A study on the teaching effect of combining BOPPPS model with blended teaching in college English classes. *Applied Mathematics and Nonlinear Sciences*, 9(1): 22-29.