Design of English Autonomous Learning System Based on Digital Signal Processing

Pingping Kang*
Jilin Communications Polytechnic, Changchun, Jilin, 130012, China

*Corresponding author: kpping@jljy.edu.cn

Abstract. The network is beginning to change people's production and life style, which has produced earth-shaking changes in many industries. The learning method based on the network also has a great impact on the traditional education. The emergence of individualized autonomous learning mode of college English with teachers as the leading factor and students as the main body makes students change from passive learning to active learning. Many college students take acquiring knowledge and information as their important purpose in the use of the Internet, which shows that online autonomous learning has become an important means of learning in universities. On this platform, students can flexibly grasp their own learning time and progress, so as to achieve targeted learning and further improve their interest in English learning. This paper expounds the construction of college English autonomous learning environment based on digital signal processing, and puts forward corresponding management measures in view of the existing problems in autonomous learning management, in order to give full play to the effectiveness of digital signal processing technology in assisting college English autonomous learning.

Keywords: Autonomous learning, Digital signal processing, College English

1. Introduction
The 21st century is an information age. With the development of society, the rapid development of science and technology and the shortening of knowledge renewal cycle, innovative and cooperative compound talents are needed. Many college students take acquiring knowledge and information as their important purpose in the use of the Internet, which shows that online autonomous learning has become an important means of learning in universities [1]. With the continuous development of modern economy, the communication between China and other countries in the world is becoming more and more frequent. English is the main language of communication with other countries, and it is widely used in daily life. The network is beginning to change people's production and life style, which has produced earth-shaking changes in many industries [2]. The learning method based on the network also has a great impact on the traditional education. After continuous reform in recent years, college English teaching has invested a lot of manpower and material resources and developed many systems and courseware to assist college English learning. The vigorous development of multimedia technology and network technology has brought modern means to college English teaching, and the development of digital signal processing has created a lively teaching environment [3].
English teaching aims to cultivate students' comprehensive English application ability, especially listening and speaking ability, and at the same time enhance their autonomous learning ability, actively advocate making full use of modern information technology, and promote the reform of English teaching mode based on computer and network [4].

With the continuous progress of modern Chinese society, culture and knowledge are also developing rapidly. Based on the extensive demand of innovative ability, a large-scale learning society has been born. E-learning can provide learners with unprecedented audio-visual experience, breaking away from the boring indoctrination of paper textbooks and teachers' classrooms, and often arousing learners' great interest in learning [5]. Web-based autonomous learning system is a learning platform to effectively solve the individual differences of learning objects, learning process, learning resources and teaching management needs, and an effective way to improve students' comprehensive ability of listening, speaking, reading and writing foreign languages [6]. The emergence of individualized college English autonomous learning mode with teachers as the leading factor and students as the main body makes students change from passive learning to active learning, makes teaching work intelligent, interactive and personalized, and improves learning efficiency [7]. With the deepening of college English curriculum reform, autonomous learning is widely used as an important auxiliary teaching method in English teaching in Chinese colleges and universities. College English online autonomous learning system has been widely welcomed by teachers and students because of its advantages of online learning. This paper expounds the construction of college English autonomous learning environment based on digital signal processing, and puts forward corresponding management measures in view of the existing problems in autonomous learning management, in order to give full play to the effectiveness of digital signal processing technology in assisting college English autonomous learning and achieve the purpose of promoting college English autonomous learning.

2. The Significance of English in Online Autonomous Learning Platform

2.1 Improve students' enthusiasm for learning

It is an inevitable trend to make full use of modern information technology and educational technology, carry out in-depth research and application of English autonomous learning network system, and cultivate students' English autonomous learning ability. On the premise of deepening the reform of college English teaching, the formation of students' individualized learning style and the development of autonomous learning ability are an important symbol of the success of the teaching reform. For students, social needs and future career development needs are the main driving force for students to learn. The concreteness and relevance of students' learning contents and needs can stimulate students' learning motivation and keep students interested in the learning process [8]. College English autonomous learning is to enable students to give full play to their subjective initiative with the help of digital signal processing, encourage students to actively explore, cultivate students' ability to find, analyze and solve problems, and maximize access to and use of various learning resources for English learning.

English autonomous learning under the network environment mainly relies on the computer network system and uses modern educational technology to create and construct a more realistic language environment and learning conditions. Therefore, students can get in touch with the target language to the maximum extent, immerse themselves in the learning atmosphere similar to the target language to perceive, appreciate and use the language, and change the mode of classroom teaching to pay equal attention to classroom and computer teaching, which reflects the practicality of language teaching and is conducive to mobilizing the enthusiasm and initiative of both teachers and students [9]. Under the background of economic globalization and information age of science and technology, knowledge is constantly updated. It is impossible for learners to receive education in school all their lives. Only by mastering the strategy of autonomous learning and learning how to learn independently can the purpose of education be achieved [10]. The network can provide more and more resources for people. When it is combined with modern English education theory, it opens another window for
learners-relying on a large number of audio, video and text materials, and opens up a new model for cultivating learners' comprehensive ability to use English language. Using digital signal processing can create a diversified and realistic language environment for students, enable students to learn and interact in the real environment, promote the formation of students' personalized learning methods, and cultivate students' autonomous learning ability.

2.2 Meet the different needs of students

College English learning objects are different individuals, the original knowledge structure is different, and the cognitive process of new knowledge is also different. Computer network is the quickest way to obtain large-capacity information, and network application is a necessary way for modern learners. Therefore, in the process of designing the learning platform, the learning content, process and computer network application are combined with each other. In the network environment, the acquisition of autonomous learning resources is diversified, and the network, as the carrier of information transmission, provides learners with a large number of available resources. Some students have a good foundation in listening, speaking and speaking, some students have a solid theoretical foundation, some students like to train their listening and speaking ability by watching video materials, some students need to gain learning experience through continuous communication with others, and some students like to gain learning motivation through practice and examination process. In the traditional classroom teaching mode, a single form of teaching materials and unified class teaching can not meet the individual needs. Students' individual differences make them need teachers to give them more autonomous learning space and provide necessary guidance, so that they can understand their own characteristics more clearly, give full play to their own advantages and make up for their disadvantages in English learning.

Students have great differences in learning attitude, cognitive style, intelligence and language potential, which determine that learners have different learning methods, learning speeds and learning effects. Compared with teaching methods, educational content should be paid enough attention. When learning English knowledge, teachers are required to incorporate cultural background knowledge into language courses as part of their language knowledge. Communication skills include three parts, as shown in Figure 1.

![Figure 1 Composition of communication skills](image)

With the continuous development of modern information technology, personal information literacy has become the main factor of effective learning. Information literacy refers to the ability of screening, obtaining and using information. The greatest advantage of the network is that it integrates all kinds of graphic and image resources and makes the network information resources multimedia. Because the network is easy to realize cooperative learning, students can turn their personal problems into public problems, solve their personal problems with the help of collective wisdom, and carry out division of labor and cooperation around common themes, which is cooperative to every subject. In order to meet people's requirements of instant communication and communication, the communication community is specially constructed in mobile learning, which provides learners with more space to communicate through the network [11]. Thus, learners can easily exchange learning experiences and answer questions anytime and anywhere, across the limitations of time and space. College English autonomous learning platform based on digital signal processing can meet the requirements of students at different levels. Students can choose their own learning content, regulate the learning process, communicate and discuss with others, and evaluate their learning results in time according to
their existing knowledge and ability level, study habits and needs, so that they can truly express themselves, creatively develop their potential and improve their learning efficiency in a multi-interactive language environment.

3. Design of English Autonomous Learning Platform in Network

In traditional teaching methods, although the management of students' status by computer has a certain history, it has also developed more mature. Computer management of students' status has been popularized, but in the past it was rarely applied to the record of learning activities of disciplines, and it was rarely inquired by teachers and students themselves, which was not conducive to students' timely learning of their own courses and teachers' understanding of students' learning situation. In traditional classroom teaching, teachers' teaching style has great influence on students, and online courses can provide more open interfaces, so that different teachers can fully explore, modify and add learning content. It is also required to have a discussion area, so that different teachers can present and communicate knowledge and content to students. With the development of information technology, learners are provided with rich learning content, while the amount of information that learners need to master is also greatly increased [12]. The learning process needs to browse all kinds of words and pictures, observe a large number of foreign language programs, and obtain real, intuitive and vivid language training scenes. Students use English autonomous learning websites to carry out extensive listening and reading after class, which increases the frequency of language reproduction, expands the space of language practice, and strengthens language input with the accumulation of quantity. Teachers use the English autonomous learning website to set up a test bank for students to test their learning effects independently, so that students can practice and test on the computer and know their learning situation in time.

The application of multimedia technology enhances the authenticity of language testing tasks, makes the testing environment closer to the real world, and measures language abilities that cannot be measured by other testing methods, thus increasing the validity of test construction. In learning and training, students should always remember the perspective rule, which is the key to express the depth of things. Figure 2 is a path analysis model for college English listening, and the dimension of establishing effective classroom environment and learning effect.

![Figure 2 Path analysis model](image)

Compare the English learning scores of the classes using college English autonomous learning system with those using traditional teaching methods, and analyze the relevant data by statistical software. After the experiment, compare the test scores of the two classes again, as shown in Table 1.

| Table 1 Two pre-test data |
|----------------------------------|-------------------|-------------------|-------------------|
| Number of people                | Experimental class| Control class 1   | Control class 2   |
| Average score of pre test of English proficiency | 70.5              | 71.1              | 70.4              |
| Average score of post test of English proficiency | 80.6              | 73.3              | 72.6              |

After the establishment of a web-based college English autonomous learning system, students' test scores of each course are registered in the score database, and students can log in to the system to access personal information through their own accounts. Students can see their study records and
adjust their study plans in time by clicking the mouse. Teachers can also know the students' learning records at any time, and guide and urge the students to complete the course study. After logging in to the system, learners can click on different functions according to the icons, mainly including the discussion of English courses, resource downloading and learning exchange. After English teachers publish the learning materials, the platform can dynamically generate student pages for students and teachers to view. Learning module query list refers to the students using the selection conditions to query the learning books, textbooks and units, and using the navigation menu to realize the selection of corresponding contents to carry out learning. In the process of autonomous learning, it is necessary to strengthen students' quality education, standardize students' civilized behavior, make them consciously establish laboratory civilization consciousness, and create a good humanistic environment in the laboratory while having advanced hardware learning environment, so that college English autonomous learners can establish positive emotions and improve the efficiency of autonomous learning.

4. Conclusions

With the development of information technology, learners are provided with rich learning content, while the amount of information that learners need to master is also greatly increased. Through the preparation of platform development, English has been successfully realized in the online self-learning platform. In the process of platform development, it can fully demonstrate the student-oriented design idea, thus effectively enabling students to learn according to their own learning needs anytime and anywhere. Individual learners should make effective use of the abundant English learning resources on the Internet, use online learning tools, strengthen self-examination, self-regulation, self-monitoring and management, and actively exert their autonomous learning ability to improve their English learning performance. With the help of digital signal processing, a diversified and realistic language environment can be created for students, so that students can learn and interact in the real environment. College English autonomous learning based on digital signal processing can stimulate students' interest in learning and help college students abandon their fear of learning English. Teachers can guide them to adjust their learning goals and strategies through timely interaction with students. Combining with the school's own hardware facilities and taking advantage of the network, autonomous learning can make up for the shortcomings of traditional classroom teaching, improve teaching and improve learning efficiency, and effectively cultivate students' comprehensive English application ability.

References
[1] Pingxiao W. Research on the english teaching and autonomous learning based on multimedia platform and smart classroom system. International Journal of Smart Home, vol. 10, no. 9, pp. 373-384, 2016.
[2] Ramik, Dominik M, Madani K, Sabourin C. A Soft-Computing basis for robots' cognitive autonomous learning. Soft Computing, vol. 19, no. 9, pp. 2407-2421, 2015.
[3] Song Yaqin. Development and Application of English Online Autonomous Learning Platform. Microcomputer Applications, vol. 34, no. 11, pp. 114-116+127, 2018.
[4] Zhao Baoceng. On the Autonomous Learning of College English in the Mobile Information Environment. Journal of Ningbo Institute of Education, vol. 20, no. 1, pp. 36-39, 2018.
[5] Li Yannan. The creation and use of multimedia network English autonomous learning model. Modern Communication, vol. 418, no. 10, pp. 243-243, 2015.
[6] Zhang Jisheng. On the cultivation of high school English autonomous learning ability . Middle school curriculum guidance: Teaching Research, vol. 9, no. 18, pp. 34-34, 2015.
[7] Ma Yuhong. Software design of English listening and speaking autonomous learning under modern technology. Microcomputer Applications, vol. 34, no. 10, pp. 94-96, 2018.
[8] Doroodgar B, Liu Y, Nejat G. A Learning-Based Semi-Autonomous Controller for Robotic Exploration of Unknown Disaster Scenes While Searching for Victims. IEEE Transactions on
Cybernetics, vol. 44, no. 12, pp. 2719-2732, 2017.
[9] Dodero JM, Gonzalez-Conejero EJ, Gutierrez-Herrera G, et al. Trade-off between interoperability and data collection performance when designing an architecture for learning analytics. Future Generation Computer Systems, vol. 68, no. 3):31-37, 2017.
[10] Xie Yutong, Wei Ruchen, Yang Linlin. Research on the Ecological Environment of Informatization English Autonomous Learning for Higher Vocational Students. Education Modernization, vol. 5, no. 1, pp. 304-306, 201.
[11] Chen Lei, Tian Xiaoyan. Design and practice of the whole-process assessment mode of digital signal processing. Education Teaching Forum, vol. 388, no. 46, pp. 281-282, 2018.
[12] Si Xiaoli. On the cultivation of students' autonomous learning ability in computer science. Digital Communication World, vol. 185, no. 5, pp. 246-246, 2020.