The Internet of Things Computer Aided Technology Oriented by the English Teaching System

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Abstract. Since the 21st century, information technology has developed rapidly, and advanced science and technology such as Internet+, big data and cloud computing have developed rapidly. People's work and lifestyle have undergone qualitative changes. At the same time, the application of information technology has covered and radiated to the whole field of education. As an important branch of education, educational technology is also constantly developing and evolving. In addition, the concept that information technology and English teaching courses need to be integrated is constantly developing and evolving. Information technology will influence and act on teaching practice. Through literature review and preliminary investigation and analysis, this paper believes that the current teaching system of English listening and speaking courses in colleges and universities is not ideal. From the perspective of the integration of information technology and curriculum, there are several teaching problems in the current English teaching system. This study sorts out the integration concept of information technology and English teaching system, and analyzes and studies the design and optimization methods of the teaching system. Finally, this paper obtains research conclusions through statistical analysis of data. After the research of this paper, it is found that the concept of information technology and curriculum integration can improve the English listening and speaking ability of college students to a certain extent. This research is based on the idea of integrating information technology and English curriculum system as a technical means, which can cover and radiate the entire teaching optimization design method. The specific research stage of this paper includes the investigation and analysis of the English teaching system in colleges and universities in the early stage, the selection of research theories, and the setting of teaching goals. This paper further analyzes the teaching situation, design and analysis of teaching media resources and materials. The research

results of this paper have good research results in the optimization of teaching process and teaching evaluation methods, and provide a feasible solution for solving practical teaching problems.

1   INTRODUCTION

With the rapid development of information technology, contemporary education faces enormous challenges. Chen and Huang [1] believed that the academic world must meet the new challenges of education and the task of teaching and educating people, and meet the teaching requirements of contemporary Information teaching. Colleges and universities need to continue to integrate the concept of information technology into practical teaching. Boyd et al. [2] believed that the promotion of this method can meet the development and innovation of information teaching. In 2020, China released the "14th Five-Year Plan" for education Information teaching. The plan also clearly points out the direction of change in education and teaching. The main purpose of this plan is to build an intelligent learning support environment and further accelerate the construction of an intelligent learning system in information-based universities. This method can effectively promote the deep integration of information technology into the whole process of education and teaching. Liu and Peng [3] believed that the English teaching in the information age should integrate information technology into the teaching system, and create an information-based teaching environment through information technology. The teaching environment can adapt to the new needs of the society for personnel training. Khanouche et al. [4] believed that the concept of integrating information technology and subject content meets the requirements of contemporary teaching and can effectively solve practical education and teaching problems. This paper deeply explores the implementation path of the integration of information technology and English subject curriculum, and deeply studies the characteristics and development trend of English curriculum teaching under the background of current education Information teaching. This paper further introduces the essence of Information teaching into the Information teaching reform of English courses, which is of great significance. However, through literature analysis and preliminary investigation, this paper finds that in actual teaching, the current situation of English listening and speaking course teaching in colleges and universities is not ideal. From the perspective of college English listening comprehension and oral expression ability, the overall level of college students' English listening and speaking ability is relatively low, and there are major obstacles in language communication and understanding. Balaguera et al. [5] believed that the college students cannot use English to express their views clearly and communicate freely. College English teaching also has corresponding problems in listening comprehension, and the function of English has been greatly reduced. There are also several teaching problems in the dimension of information technology and curriculum integration. The main problem is that the teaching design is outdated and the application of a single technology tool in teaching is relatively rigid. The technical tools are superficial and disconnected from actual teaching. There are many problems such as the separation of teaching tools and teaching objectives. The teaching optimization design based on the application of information technology and the concept of curriculum integration in this study provides a practical solution to the above problems to a certain extent.

The research content of this paper is further applied to the teaching practice of English listening and speaking courses in colleges and universities. This paper takes design research as the main research method. Under the guidance of the concept of the integration of information technology and English curriculum, this paper measures and evaluates the information-based teaching ability of English teachers in colleges and universities. Secondly, this paper designs and

optimizes the whole process of teaching, especially the design and adjustment of teaching procedures. In addition, Cortina [6] believed that the main problem is that the teaching system is relatively old. The application of a single technical tool in teaching is relatively blunt. The teaching process is superficial, and the teaching system is out of touch with the actual teaching. College English listening and speaking course, as an important practical course in English, plays an important role in improving the English ability of college students. The integration of information technology and English curriculum system is the solution to practical teaching problems.

At the same time, this research is devoted to the idea of the integration of information technology and English curriculum teaching, and guides and optimizes the teaching design through this idea, so as to improve the teaching quality and promote students' learning. This research focuses on the integration of information technology and the English teaching system, and improves the English language listening and speaking ability of college students by optimizing the teaching design of English listening and speaking courses in colleges and universities. In terms of theory, this research draws on the advantages of the teaching design of English listening and speaking courses in colleges and universities and removes the shortcomings. Le [7] believed that colleges and universities make full use of the concept of information technology and curriculum integration to further optimize the teaching system. This study follows the teacher-led-student-subject teaching theory and Butler's prior teaching theory. The research results provide new ideas and directions for the teaching design of English listening and speaking courses in colleges and universities. This research takes college English teaching practice as the research goal. In terms of teaching design optimization, Sara et al. [8] believed that the colleges and universities have not negated or subverted the teaching design of English listening and speaking courses in colleges and universities in the early stage, but integrated the concept of information technology and subject content integration on the basis of the original teaching design. In general, the concept of information technology and curriculum integration has a high guiding significance, which helps to optimize teaching design. In teaching practice, this concept method is easy for college English teachers to familiarize and operate, and has strong universality. Therefore, the application of computer-aided design method by college English teachers in teaching practice has good practical effect. This method helps to promote English teaching practice and students' learning, and has practical significance and reference value in actual English teaching.

1.1 The Summary of Research on Information Technology and English Teaching System

Domestic and foreign research based on the concept of information technology and curriculum integration has specific path requirements. This paper focuses on the integration of information technology and specific subject content and on this basis guides and optimizes specific content. This method has become a research trend of current English teaching design. This research orientation has a certain effect and influence on teaching. To a certain extent, teaching design is the core link of English teaching, and it is also the premise and foundation for teachers to teach effectively. Therefore, Wu et al. [9] believed that for teachers, they should improve teaching based on teaching design, cultivate and develop their own knowledge structure, and enhance their comprehensive strength in content creation and design. In addition, teachers can solve problems proficiently and creatively, and design English teaching courses adapted to local conditions according to the actual teaching situation. At present, the research trend and path of the concept of information technology and curriculum integration turn to the micro-field and this method is helpful to solve the practical problems of English teaching. The overall framework of computer-aided blended English classroom teaching mode is shown in Figure 1. However, there are still some problems and limitations in the related research in China. For example, the current relevant domestic research focuses on pre-service and primary and secondary school teaching, while the research on college teaching has not been widely popularized and deepened. In actual teaching, Sun et al. [10] believed that the effect of integrating information technology with specific subject content is not ideal.
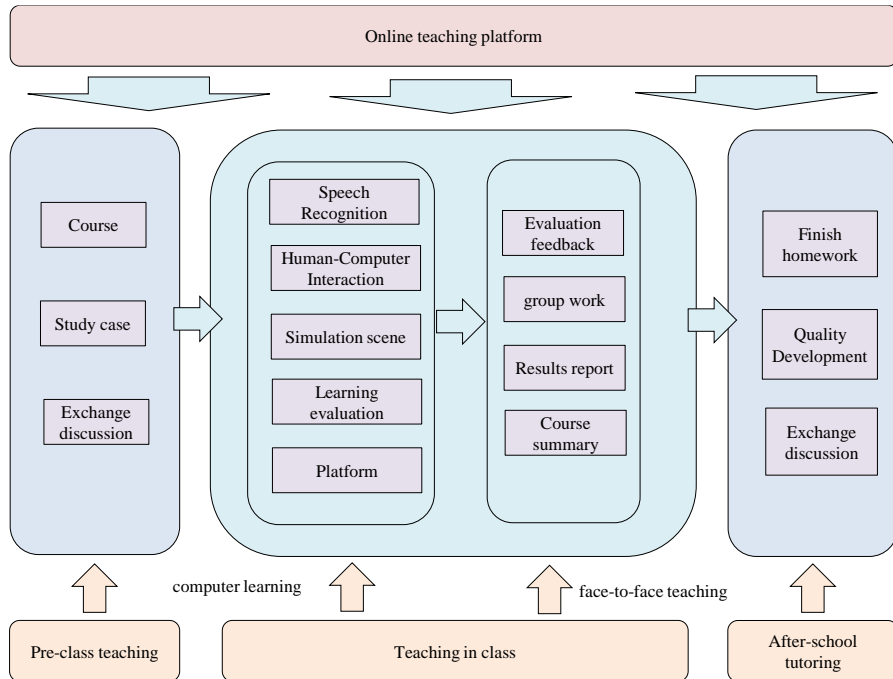
Figure 1: The overall framework of computer-aided blended English classroom teaching mode.

In terms of English teaching content in colleges and universities, there is a relative lack of in-depth integrated teaching practice. Relevant research shows that teachers should plan and design technology-integrated courses, that is, apply the concept of information technology and curriculum integration to optimize teaching. The English teaching design aims to improve the teaching effect and promote students' learning. In a word, the theory about the integration of information technology and curriculum is helpful to guide teachers to carry out the optimization of instructional design. The research content of the design research carried out through the Internet of Things computer technology is becoming more and more obvious and mature. Relevant research can promote the development of teaching specialization and the penetration of educational technology. This type of research can effectively promote the improvement of school education.

1.2 The Theoretical Research Basis of English Teaching System

Constructivist learning theory was put forward by Swiss educational psychologist Piaget in the early days. Constructivist learning theory mainly involves four elements. Specifically, it includes context, communication, collaboration, and meaning construction. This article combs the constructivist learning theory. This theory asserts that knowledge is not imposed and imparted, but that knowledge grows naturally. Research believes that knowledge is acquired by learning and practicing individuals through continuous exploration and active learning. At present, knowledge learning mainly includes autonomous and collaborative learning, and students continue to build a knowledge system with the assistance of self-active learning and teacher peers. In addition, the concept of the integration of information technology and subject curriculum can meet the theme of constructivist learning in English teaching in colleges and universities. Among them, network resource conditions, video and audio sharing basis, careful preparation of courseware, combined use of design and media can effectively assist students in knowledge construction, and then promote students to carry out English learning.

Teachers should not only guide students to learn actively, but also promote students' learning. The main body of students means that students are the main body of learning and also the main body of teaching. Teachers' teaching faces all students, and students acquire knowledge and skills from teaching. There is a dialectical and unified relationship between the teacher's leadership and the students' subject. Teacher-led and student-led are interrelated and promote each other. The leading role of teachers can be brought into full play, which can promote students' initiative and enthusiasm in learning and stimulate students' learning motivation and interest. Students' enthusiasm and initiative in learning can be fully reflected. These contents are closely related to students' motivation and interest in learning. The innovation of these teaching methods can reflect the leading role of teachers in teaching. The organic combination of the two is beneficial to teachers' teaching and can promote students' learning. This study adopts the teaching theory of teacher-led and student-centered, which has an important practical role in guiding the practice of the English teaching system. This research focuses on the inheritance of the concept of information technology and curriculum integration. The design and optimization of the English teaching system is suitable for college English teaching. At the same time, the concept of information technology and curriculum integration needs to further focus on the students' willingness to learn in guiding teaching design and optimization. For example, this method emphasizes students' self-learning and self-inquiry learning, and this method pays attention to the leading role of teachers' teaching. However, the imbalance of the current teaching norm can lead to poor student learning. In this study, the English teaching system needs to focus on the role of teachers and students, so as to maintain the normal state of teaching balance. This kind of teacher-led and student-centered teaching theory helps guide the optimization of the English teaching ideological system, so as to better promote teachers' teaching and students' learning.

2   THE GENERAL METHODS OF THE CURRENT ENGLISH TEACHING SYSTEM

2.1   The English Teaching Curriculum Observation and Practice Methods

There has been research on the formulation of Butler's teaching theory and teaching procedures. In the 1970s, the famous American educational psychologist Butler proposed the teaching theory and teaching procedure of autonomous learning. The expert is the initiator and researcher of the early autonomous learning theory. The teaching procedure proposed by Butler emphasizes students' autonomous learning, enhances students' awareness of autonomous learning, and promotes the cultivation of students' knowledge and skills, so as to enhance students' learning effect. At the same time, Butler proposed the seven-step main teaching activity procedure of education and teaching. Butler's teaching activity program can optimize and improve the missing links and steps of the teaching system of English listening and speaking courses in colleges and universities. The selection basis of Butler's teaching theory and teaching procedure includes several aspects. Compared with other types of theories and teaching procedures, this method has no special teaching conditions. This method is quite different from other types of teaching procedures. On the one hand, teachers need to accurately grasp the connotation and extension of concepts related to teaching content, so that teachers can implement teaching. On the other hand, teachers need to analyze teaching phenomena and teaching systems. This method requires teachers to accurately provide typical learning cases, and then reveal the principles and laws behind them. At present, Butler's teaching theory is more applied to the humanities and history disciplines. Butler's teaching theories and teaching procedures are characterized by strong flexibility. Its teaching procedures will be adjusted according to different teaching contents. Especially in the selection of teaching methods and the design of teaching activities, this method can be adjusted appropriately according to the actual situation of teaching. This method has certain practical significance for teaching. The main process of colleges and universities using computer technology to carry out English teaching activities is shown in Figure 2.
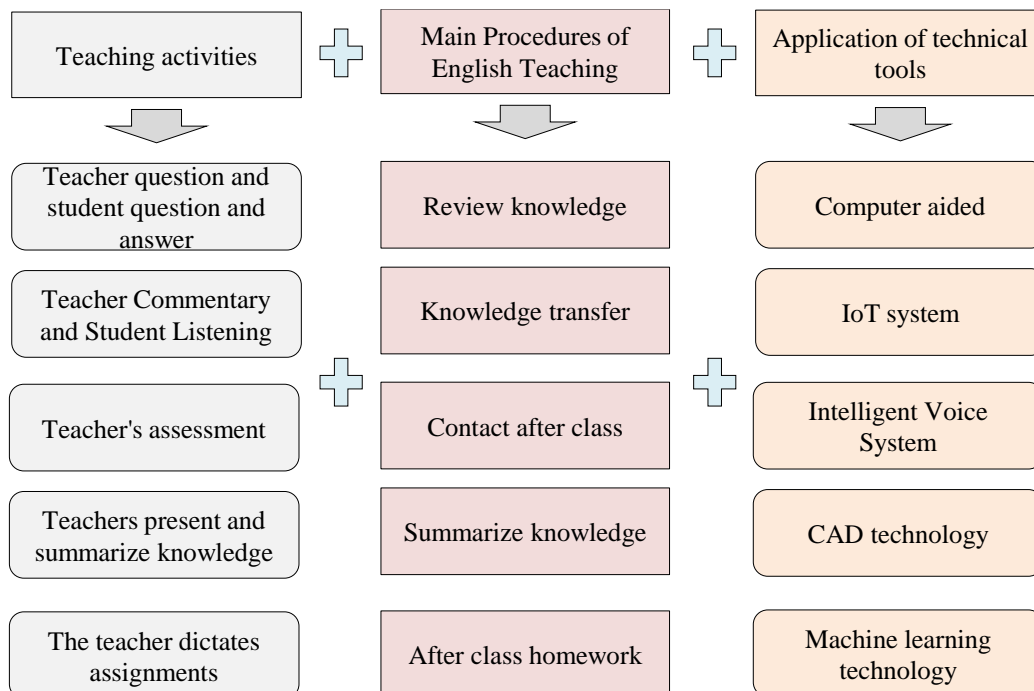
Teaching activities	Main Procedures of English Teaching	Application of technical tools
Teacher question and student question and answer	Review knowledge	Computer aided
Teacher Commentary and Student Listening	Knowledge transfer	IoT system
Teacher's assessment	Contact after class	Intelligent Voice System
Teachers present and summarize knowledge	Summarize knowledge	CAD technology
The teacher dictates assignments	After class homework	Machine learning technology

Figure 2: The main process of colleges and universities using computer technology to carry out English teaching activities.

2.2 The Overall Observation and Practice of English Listening, Speaking, Reading and Writing

College English teachers should take college students as their teaching centers. In the whole process of English teaching, teachers' pay enough attention to students' learning status and performance. However, as a freshman in a college, the basic knowledge of English is not solid, and the knowledge structure is not systematic enough. The rhythm of the teacher's teaching is not synchronized with the learning ability of the students. Therefore, the learning effect of students is hindered to some extent. In the design and observation dimension of teaching media and course materials, school teachers need to actively use advanced teaching technology tools. In the current environment, English teachers do not have good application of computer technology to carry out practical teaching, but only use information technology as course material. The material presentation tool. Although teachers carefully design courses, the designed courses lack the guidance of theoretical framework. Most of the course content comes from personal teaching experience and does not make good use of teaching technology tools. The use of computer-aided tools in the English teaching system can greatly reduce the use effect, and does not maximize the function. The current teaching content is in a state of separation from the entire teaching process. The comparison of cost consumption of English teaching effect in different years is shown in Figure 3.
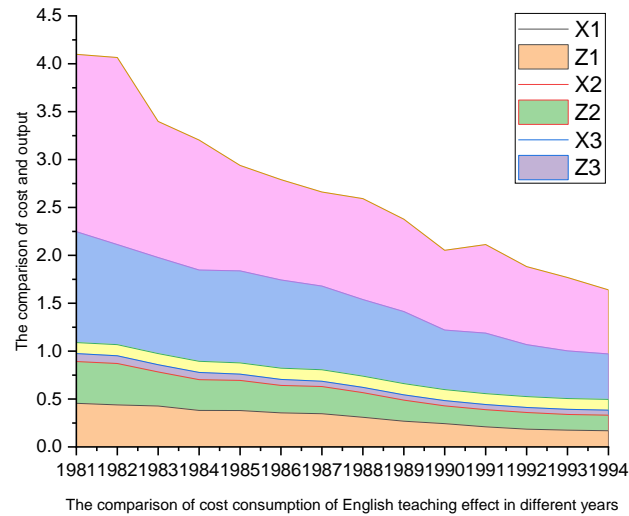
The comparison of cost consumption of English teaching effect in different years

Figure 3: The comparison of cost consumption of English teaching effect in different years.

2.3 The Comprehensive Research and Analysis on English Teaching

According to the syllabus and curriculum requirements, teachers focus on cultivating the basic knowledge and basic skills of English audio-visual of college students. Colleges and universities pay attention to teaching curriculum planning, and pay attention to the cultivation of students' emotions, attitudes and values. The current English teaching system does not focus on cultivating students' English thinking, and lacks the cultural elements in the English function. In this paper, a large number of direct perceptual research materials are obtained by the research method of field observation. This article focuses on the teaching system and technical tools of college English listening and speaking courses. The integration of English teaching technology and course content can support the personality of the English teaching system. The application of computer technology helps to record, organize and analyze the acquired teaching and research materials. This study observes and analyzes the entire teaching system of English listening and speaking courses in colleges and universities in the early stage. The focus includes the analysis of the setting of teaching objectives, the analysis of the system and the analysis of the teaching content. In addition, the computer-supported English teaching system also focuses on the analysis of teaching media and course materials, the analysis of teaching procedures, and the analysis of teaching evaluation. The Main Objectives and Contents of English Teaching Curriculum is shown in Figure 4.

From the observation dimension of teaching content, teachers usually optimize the teaching content by scripting. The teaching content lacks the effective design and expression of the teaching system. In terms of knowledge and skills of teaching content, the current teaching system has not refined and expanded specific teaching tools. The current teaching content sticks to the textbook itself, which makes the teaching content boring, regular and lacking in innovation. Teachers try to change the way they teach, but they lack guidance in theory. In addition, the current teaching methods do not resonate and interact with students, which in turn affects the overall teaching effect.
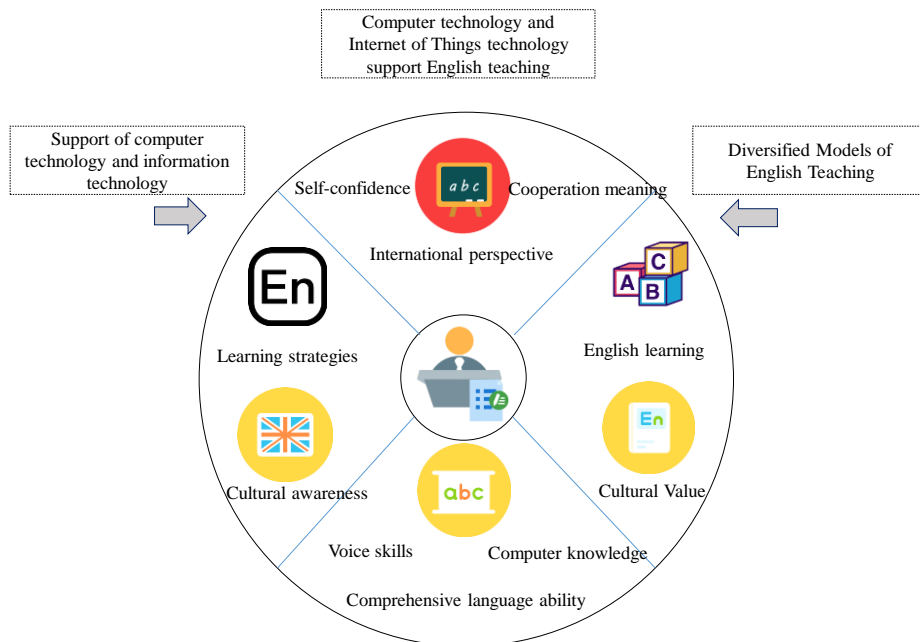
Figure 4: The Main Objectives and Contents of English Teaching Curriculum.

The teacher divides the text into paragraphs according to the logical relationship of the text, and expounds the author's point of view and central idea according to the teaching content. The text is explained in a logical order, and the content of the course is broken down according to the main idea of each paragraph. The content of the text can be better absorbed by the students, and the content of the course can serve the teaching of English courses and students' learning. Subject teaching needs to expand the breadth of text knowledge, and the teaching content needs to highlight the cross-cultural and social communication functions of the English language. Teachers focus on the subject of the course, content thinking, cultural thinking and other related knowledge in the teaching session. This research enables students to have a deeper understanding of course knowledge.

3 THE COMBINATION MODEL OF INFORMATION TECHNOLOGY AND ENGLISH TEACHING SYSTEM

3.1 The Research Concept of Information Technology and Curriculum Setting

Teachers test students' learning of course knowledge in groups by random roll call and spot check. Through simple vocabulary collocation, phrase repetition and flexible application, English course teaching requires small drills and tests on the sequence of sentence pattern drills. Computer-based teaching of English courses needs to be able to detect students' mastery of course knowledge. At the same time, students will prompt and correct errors in English knowledge in the teaching process in a timely manner. This method can timely test the level and degree of students' knowledge learning. At the current stage, discipline construction will repeatedly correct and repeat knowledge points for frequently occurring English vocabulary, phrases, sentence patterns and grammatical errors. In addition, English teachers need to consolidate the presentation of the

curriculum system and interpret the key points and difficulties of the curriculum in detail. Teachers need to highlight key points and difficulties, strengthen interaction with students in classroom teaching, and understand students' mastery of knowledge. This teaching mode can make the teaching knowledge points clearer, and the students' memorization ability can be systematically deepened and improved. Finally, the teacher assigns homework and explains the tests and inspections that will be used after the homework is completed. The types of assignments include flexible collocation and application of key words, phrases and sentence patterns. The program of teaching activities in colleges and universities can be summarized as five links: reviewing old knowledge, teaching new courses, practicing after class, summarizing knowledge and assigning homework. The analysis of the overall effect of computer technology applied to the entire English teaching system is shown in Figure 5.
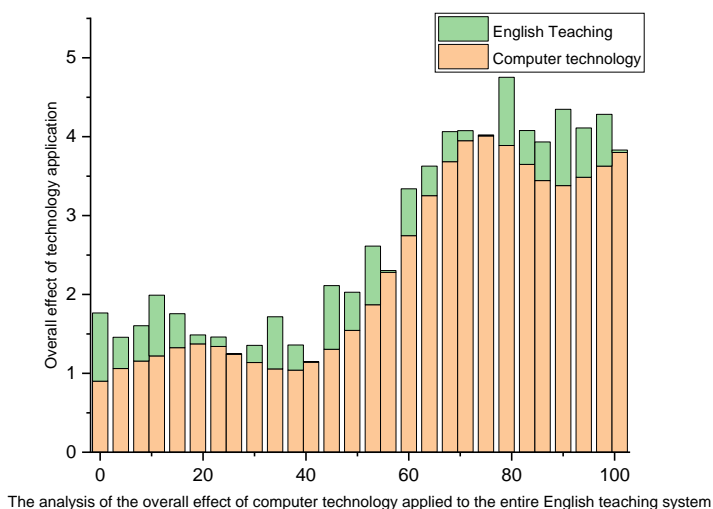

The analysis of the overall effect of computer technology applied to the entire English teaching system

Figure 5: The analysis of the overall effect of computer technology applied to the entire English teaching system.

3.2   The Information Technology and Program Design of Course Teaching Activities

The optimization of the English teaching system focuses on cultivating students' language practice ability and improving their comprehensive English language ability. On the basis of students' basic knowledge of English language learning, students can cultivate their practical application ability of English language. On the one hand, the teacher group pays attention to the cultivation of systematic knowledge of English language in the written test, and on the other hand, it focuses on the cultivation of students' listening and speaking ability. In the application of English subjects, schools need to strengthen students' ability to communicate, communicate and solve problems in English teaching. The English subject system needs to strengthen the cultivation of intercultural communication skills. The subject system makes the subject content easy to understand by simplifying the English listening and speaking courses. The optimization of the English teaching system can broaden students' cultural vision and language sense, and enhance students' desire to study language. The ontology design of the textbook incorporates a blended teaching model, as well as various elements such as online teaching. The teaching system makes full use of teaching media resources and technical tools for teaching. The overall design of the textbook is in line with

the concept of information technology and curriculum integration. The deepening of the teaching system will help to promote students' autonomous learning and collaborative learning ability, and enhance the comprehensive effect of subject teaching based on this. Subject teaching needs to meet the personalized teaching needs of English subject content. At the same time, the optimization of the subject system also pointed out the direction for the improvement of teachers' information teaching ability and professional development. In short, information technology provides a large number of teaching resources and courseware, enabling teachers to share course resources. Information technology also provides practical teaching support for teachers, which is conducive to promoting the professional development of college teachers and clarifying the path and direction of subject research. The Combination Channel of English Teaching Mode and Computer Support Technology is shown in Figure 6.
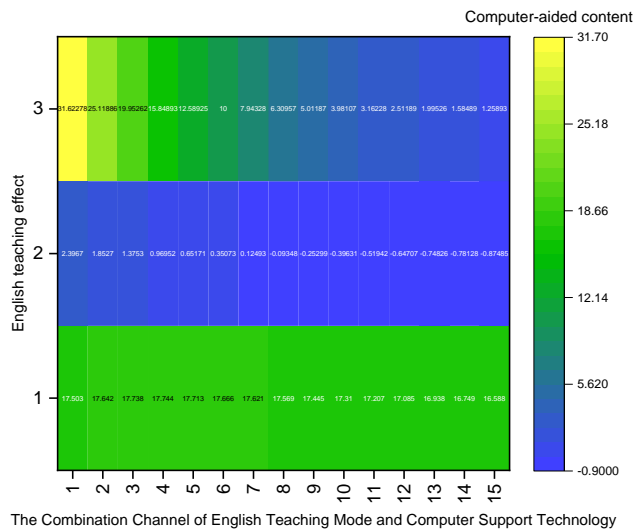

Figure 6: The Combination Channel of English Teaching Mode and Computer Support Technology.

3.3 The Combination of Information Technology and Course Teaching

The continuous development of computer technology provides a direction for the optimization of the English teaching system. Scholars apply information technology to the optimization process of the English teaching system through video or computer technology tools. In addition, the setting methods of English teaching situations are flexible and diverse, and the setting methods of the teaching system mainly include the following five aspects. First of all, the teaching content can introduce popular original English music, specifically to provide students with rich and diverse English learning resources. In addition, computer technology can also deepen students' perceptual understanding through audio-visual technology. The content of English teaching is expressed through mind maps, and students make a simple overview of the knowledge chain according to the mind maps in computer technology. Through the in-depth understanding of mind maps in computer technology, teachers can further strengthen the training effect of students' ability to speak English. The mind map of computer technology can reflect the overall framework of the English curriculum system. This technology can stimulate students' enthusiasm for learning and improve their learning efficiency. The Combination Mode of English Teaching Effect and Computer Technology is shown in Figure 7.
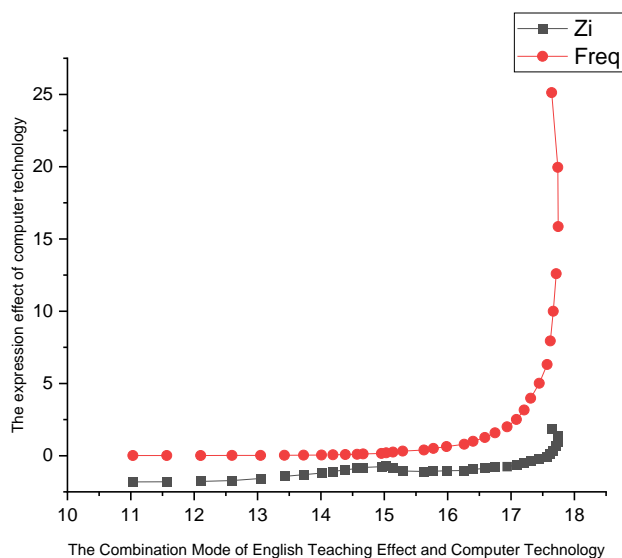
Figure 7: The Combination Mode of English Teaching Effect and Computer Technology.

In addition, this paper optimizes the relevant course content through computer technology to improve the cultivation level of the English cultural literacy of the students. Import the famous sayings and aphorisms of English curriculum culture into the courseware through computer technology. In addition, adding cultural shocking viewpoints to the English teaching system can effectively improve students' thinking ability. In the setting of the subject teaching system, the school needs to give students 5 minutes to prepare a small speech, and the student group needs to make a statement of support or refutation on the topic of discussion. This kind of situational setting method can help to cultivate students' English learning. This situation can improve students' ability to summarize opinions and cultivate students' English language and cultural quality. In addition, the school broadcasts classic repertoires in English through computer technology, and students imitate the content of the repertoire by role and play the main roles in the repertoire. Students can take the initiative to imitate their favorite characters with prior preparation. The school stimulates classroom teaching atmosphere through group performances. Subject education can fully mobilize students' enthusiasm for English learning and enhance students' interest in learning. In addition, teachers inspire students' understanding of the English curriculum through technological tools. The school stimulates students to learn and think through subject training on subject-related issues.

4   CONCLUSION

The school stimulates students' learning motivation, and strengthens the technical guidance of computer tools by enhancing students' interest. The group of teachers conducts English teaching courses through familiar teaching methods. This paper mainly involves two teaching strategies and methods. One is that in the teaching situation, teachers will use computer technology to guide students to solve practical problems encountered in real life or social practice. In addition, teachers help students think or analyze problems through specific questions and answers. In addition, the school curriculum involves mutual communication and connection between students and teachers. In addition, the system greatly stimulates students' ability to actively learn and think positively. The English teaching system has a great influence on students' study habits. English teachers use

structured or semi-structured methods to arouse students' positive responses and full thinking by presetting questions. Second, the school uses media equipment to play English soundtrack movie clips in English classroom education. Original sound movie clips are closely related to course teaching, and schools can improve students' learning motivation and interest through this type of teaching process. The school helps to inspire students to think through the playback of English soundtrack films. English teachers further clarify the theme and content of English teaching by asking students questions. This method can closely combine the content of English movies with the course teaching, and fully enhance students' motivation, interest and learning awareness.

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REFERENCES

[1] Chen, H.; Huang, J.: Research and Application of the Interactive English Online Teaching System Based on the Internet of Things, Scientific Programming, 7(11), 2021, 1-10. https://doi.org/10.1155/2021/3636533

[2] Boyd, G.; Keller, A.; Kenner, R.: Remedial and second language English teaching using computer assisted learning, Computers & Education, 6(1), 2021, 105-112. https://doi.org/10.1016/0360-1315(82)90019-7

[3] Liu, L.; Peng, N.: Evaluation of user concentration in ubiquitous and cognitive artificial intelligence‐assisted English online guiding system integrating face and eye movement detection, International Journal of Communication Systems, 1(7), 2020, 13-18. https://doi.org/10.1002/dac.4580

[4] Khanouche, M.-E.; Atmani, N.; Cherifi, A.: Improved Teaching Learning-Based QoS-Aware Services Composition for Internet of Things, IEEE Systems Journal, 7(12), 2020, 1-10. https://doi.org/10.1109/JSYST.2019.2960677

[5] Balaguera, H.-U.; Wise, D.; Ng, C.-Y.: Using a Medical Intranet of Things System to Prevent Bed Falls in an Acute Care Hospital: A Pilot Study, Journal of Medical Internet Research, 19(5), 2019, 50-61. https://doi.org/10.2196/jmir.7131

[6] Cortina, B.: Teaching English to Pre-Primary Children: Educating Very Young Children, ELT Journal, 2(17), 2022, 21-27. https://doi.org/10.1093/elt/ccac007

[7] Le, R.: Pedagogies in English for Academic Purposes: Teaching and Learning in International Contexts, ELTIE Journal, 8(11), 2022, 9-15. https://doi.org/10.1093/elt/ccac022

[8] Sara, M.; Daniela, C.; Di, T.-S.: Linguistic characteristics of different types of aphasia: A computer-assisted qualitative analysis using T-LAB, Journal of Neurolinguistics, 6(12), 2022, 101-105. https://doi.org/10.1016/j.jneuroling.2021.101056

[9] Wu, Q.; Li, Q.; Guo, D.: Exploring the vulnerability in the inference phase of advanced persistent threats, International Journal of Distributed Sensor Networks, 18(3), 2022, 402-418. https://doi.org/10.1177/15501329221080417

[10] Sun, C.; Wei, L.; Young, R.-F.: Measuring teacher cognition: Comparing Chinese EFL teachers' implicit and explicit attitudes toward English language teaching methods, language Teaching Research, 26(3), 2022, 382-410. https://doi.org/10.1177/1362168820903010