Analysis of the Application of Information and Communication Technology (ICT) in the Field of Higher Vocational Education

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Abstract: For the understanding and application of information and communication technology (ICT, information and communication technology) research, should not only stop at the simple understanding of how, but should be in-depth analysis of information and communication technology and the development of the times and the reform and innovation of higher vocational education information, this article has been in the network search literature and support, combing the mainland information and communication technology in China's field of higher education application status quo, that is, mainly from information and communication technology (ICT) concept and connotation, As well as the application of information and communication technology in the field of higher vocational education two aspects of the collection of literature analysis, and strive to truly understand the application of information and communication technology (ICT)in the field of higher vocational fields of the main areas, methods and problems, so as to provide a reference for researchers to understand the application of information and communication technology in the field of higher vocational education analysis.

1. Introduction

On July 22, 2000, leaders of Canada, Russia and other eight countries issued the Okinawa Charter of the Global Information Society aimed at promoting the development of information and communication technology, narrowing the gap in information technology development between countries and regions, and building a global information society. It is said that "Information communication technology (ICT) is one of the most powerful driving forces for social development in the 21st century, and is rapidly becoming an important driving force for the growth of the world economy [1]. "Since then, ICT has been highly valued all over the world, It has also been widely used in various fields, and the research on ICT has shown an upward trend year by year (see figure 1). The search of China knowledge Network (CNKI) with "information and communication technology" as the keyword shows that there have been 745 articles since August 2000, of which 37.43% are directly on the subject of "ICT", accounting for 341%, and 26.56% are on the subject of "information and communication technology" (see figure 2). Through the above data, we can see that the application and research of ICT began to get people's attention.

However, there are differences in people's understanding of ICT, and their understanding of its definition and connotation is controversial. The understanding of ICT is not consistent even in the professional field of information and communications, but also is based on a variety of technologies, as well as on high-speed communication networks, such as broadband, wireless networks and so on. Others put information transmission and sharing into the scope of ICT and think that ICT is a general intelligent tool [2]. However, in the actual description, there is no description of the specific presentation mode of the so-called "technology", nor can it describe the "intelligence" presentation and degree of the so-called general intelligent tools. Therefore, based on the above analysis, it is found that there is still some controversy on the definition of ICT, and the specific connotation is relatively vague [3]. However, it can be predicted that triple play will be a foundation and antecedent of ICT. At present, IPTV and mobile TV, which can be mentioned and applied, are also typical

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scenarios and examples for understanding information and communication technologies. With the development of the Internet, “ICT” will serve as an important platform for customers, and will combine and blend the two services of “IT (Information Industry)” and “CT (Communication Industry).” In the future, the communications industry, the electronic information industry, the Internet and the media will all be possible to merge. Therefore, with the rapid development of information technology, people’s enthusiasm for research on the connotation and application of information and communication technology has gradually increased in recent years. Based on the literature retrieval of China knowledge Network, this paper will sort out the research on the theory and application of ICT in mainland China in the past 10 years, and mainly sort out the current cognitive consensus on the concept and connotation of ICT in the field of theoretical research. In the application of “ICT”, it mainly focuses on the application status of “ICT” in the field of higher vocational education. The purpose is to truly understand people’s understanding of ICT and the application fields, as well as the methods and existing problems in the field of higher vocational education ,in which to provide reference for the analysis of ICT .

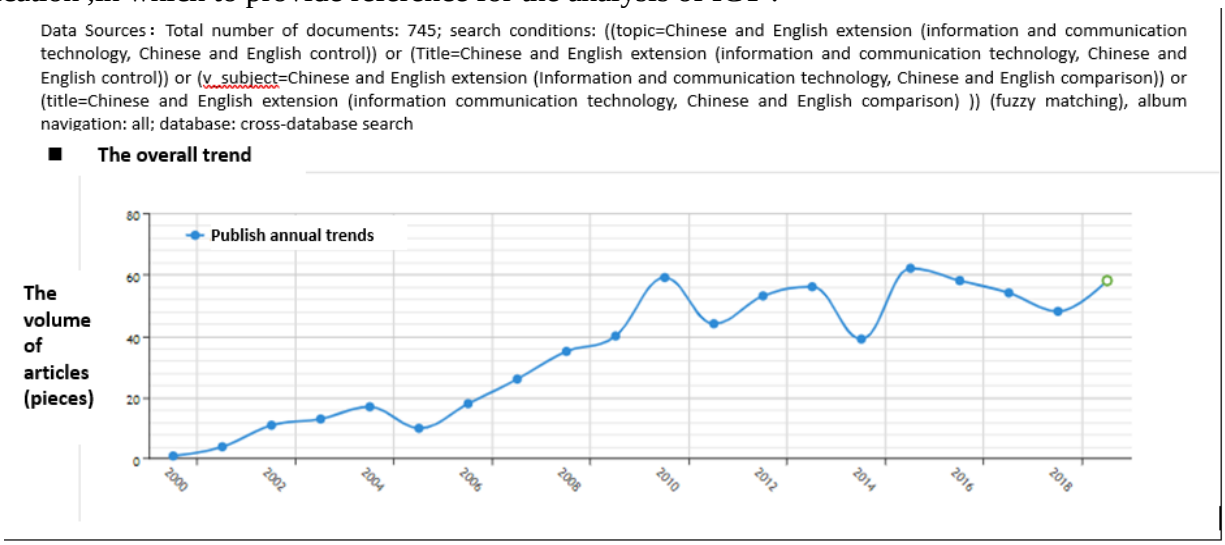

Figure 1 Trend of ICT subject literature (2000-2018)

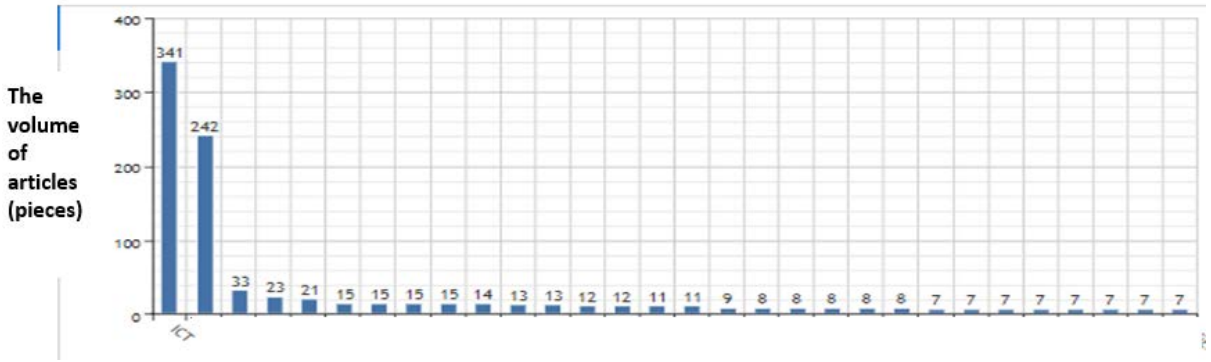

Figure 2 Ranking of topics related to ICT (2000-2018)

2. Literature review

The definition and connotation of Information and Communication Technology, there are two main forms of information communication: data transmission and signal transmission. The form of data transmission is to convert the information data through a converter to make it a signal that meets the transmission requirements [4]. After completing the task of transmitting to the predetermined destination, the inverse converter is used to convert the signal to information for receiver application. Common forms of signal transmission, including frequency band transmission, baseband transmission and carrier transmission. Generally speaking, the transformation of information is

mainly in the form of digital signal and analog signal. For example, optical fiber transmission is to transform information into analog signal, and then rely on optical cable to complete the corresponding transmission task [5]. After receiving the relevant information, the receiver can change the form of information.

From the point of view of technical realization, the structure and characteristics of information resources transmission are mainly composed of three parts: the transmission computer room, the internal network of the computer room and the external network. The transmission equipment in the computer room includes digital audio distributor, PCM equipment and optical equipment and so on. the internal network structure of the computer room is generally a star-shaped topography structure, which is shown in figure 3.

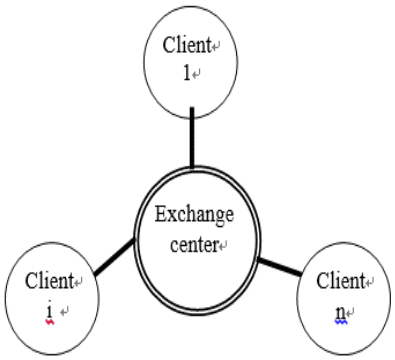

Figure 3 Topological structure diagram of information resource transmission in computer room. (Source: scientific and technological innovation and application 201201-P51)

The wiring of the computer room mainly has internal and external distribution frames and wiring card positions and other equipment, which are logically linked according to the settings of the communication protocol. The external network is mainly composed of optical cable router, cable routing and manhole, pipe hole and other equipment on the router, which the link relationship is between these communication devices. It can be seen that the exchange of data is mainly carried out between the entities of the information technology communication and transmission network [6]. The main characteristics of the system are as follows: complex relationship between transmission media, wide range of data sources, inconsistent definition standards and expression forms of information, large amount of data information, and obvious spatial characteristics.

From the above technical content, we can see that ICT is an inclusive term which covers all communication devices or applications: for example, radio, television, mobile phones, computers, network hardware and software, satellite systems, etc.; and a variety of related services and applications, such as video conferencing and distance learning. In the process of discussion in this paper, it is mainly based on the application analysis of ICT, which belongs to non-technical research. Therefore, the information and communication technology (ICT) mentioned in this paper more refers to communication equipment or application software, and its connotation is no longer limited to mobile phones, computers, network hardware and software, and communication equipment and facilities of satellite systems.

3. The application ICT in higher vocational education

Since the promotion and development of ICT was mentioned in the 2000 “G-8 Declaration” and “Okinawa Charter of the Global Information Society”, it has been paid attention to by various countries, and the application, role and influence of information and communication technology in the field of higher education have been gradually expanded. The application of “ICT” has had a far-reaching impact on the teaching and management of higher education. The updating iteration of information and communication technology has also given rise to a revolution in the application of it in the field of education. ICT has exerted an important influence on higher education, including the change of teaching means, the change of teaching method, the change of education mode, the change

of teacher-student relationship and the modernization of school management. Modern information and communication technology has not only brought vigor and vitality to the reform and development of higher education, but also brought huge negative impact on higher education . The significance of ICT to higher education lies in the characteristics of students, especially their motivation. That is, what is the students' actual attitude towards learning. We have seen and heard some teachers say that if students are serious students, they can use the Internet to enrich their listening and reading, cultivate their foresight and deepen their understanding of the course. However, if students are only passive (the number of such students will increase with the expansion of admission opportunities, mainly in order to get a diploma needed for a better job after leaving college), then they are unlikely to use online resources to deepen and expand their knowledge, but to look for resources around the world to make their writing assignments look more advanced and professional. And often intentionally or unintentionally cross the boundaries of plagiarism. One of the great ironies associated with these new communications and information technologies is that new technologies make it easier for those who are not interested in education to make it easier to exaggerate their actual access to education. In fact, we find from the literature that the application of ICT in higher education is not only in facilities and teaching implementation process, but also includes the capacity development and definition of users. In November 2011, UNESCO released the "UNESCO teacher ICT competency for Teachers," (hereinafter referred to as the "ICT-CFT" framework) at the 36th General Conference of the UNESCO. The Framework describes teachers' competency indicators from six focus areas in education: ICT in understanding education, curriculum and evaluation, teaching methods, of information and communication technology, organization and management, and teachers' professional learning. In other words, information and communication technology in the field of higher education should basically include school management, teaching, teachers and other aspects of the school.

4. The application of ICT in the field of higher vocational education

With the rapid development of the network, ICT with the computer as the core has penetrated into all fields of social life. In the field of education, ICT has become a powerful driving force to promote education reform. ICT is not only a content to learn, not only an auxiliary tool for traditional education, but also an important factor to promote the development of the whole education system. It promotes deep changes in the goal, content, method, form and school structure of education. The integration of ICT and higher vocational education has become an important development trend in the current reform of higher vocational education. From the analysis of the relevant literature retrieved, we find that the main applications of information and communication technology (ICT) in the field of higher vocational education are:

4.1 Teaching tools

This part mainly uses ICT as a teaching tool for teachers. Teachers can use ICT to create a variety of external learning conditions to enhance the effect of learning. In 1999, Imel experts designed a guide for the application of ICT technology in higher vocational education, including allowing learning results to promote the development of technology, so teachers must take technology as an important tool, take technology as an important part of teaching and plan, strive to integrate technology into curriculum and teaching, and transfer teaching from teaching to learning through technology. By adjusting the role of teachers, teachers will no longer be the only source of information; through the use of technology, teaching tasks will be changed from primary cognitive tasks to advanced thinking tasks, with emphasis on cultivating students' design ability and construction ability [7]. The typical literature is the research on the mixed teaching practice of the curriculum integration of information technology and higher vocational communication majors. taking the higher vocational communication major course "Optical Fiber Communication Engineering" as an example, in the second semester of the 2016-2017 academic year, in Nanjing Institute of Information Vocational Technology, we tried the mixed teaching of information technology and curriculum integration in two classes of communication technology major in Nanjing

Institute of Information Technology. Using the Dejin action research method to carry out practical research; in the research on the integration mode of ICT and preschool English classroom teaching in higher vocational colleges in mountainous areas, it is mentioned that through the effective integration of information technology and higher vocational English classroom teaching mode, we can understand the ways and methods of integration, and apply information technology to preschool English classroom teaching in higher vocational colleges, so that preschool education majors can have a certain ability to use information technology and information literacy, and narrow the gap between mountain areas and coastal areas as well as other provinces and cities. In order to cultivate a new type of modern preschool teachers with regional characteristics to serve the economy in mountainous areas. in the research on the theory and practice of English teaching for computer majors in higher vocational colleges based on ICT, the task-based learning method based on ICT is put forward, which makes use of the characteristics of immediacy, sharing, interaction and flexibility of modern information technology to innovate the ideas and methods of traditional rigid English courses for computer majors in higher vocational colleges, so as to build a highly personalized professional English teaching platform for teachers and students [7].

4.2 The measurement standard of teachers' information-based teaching ability

With the wide application of information technology in the field of higher vocational education, the application ability of information and communication technology has become an important index to measure a teacher's teaching ability. Based on the Information and Communication Technology competency Framework for Teachers developed by UNESCO, many institutions measure and assess the abilities that teachers should have to use ICT to teach effectively.

4.3 ICT as a means of learning for students

ICT provides students with tools to enable students to choose their own learning styles and problem-solving methods, which will help students to complete their tasks better. ICT provides conditions for students to change their way of learning. They can exchange information and share learning experiences with people all over the world through the Internet, and explore ways to solve problems.

4.4 The application of ICT in higher vocational management

Now ICT technology is more and more widely used in higher vocational education management, ICT can strengthen educational management, and even some institutions use ICT for management rather than teaching.

4.5 ICT is used in higher vocational career education and guidance

College students' career education and guidance can put forward many methods and strategies to enable people to make corresponding choices in their work and life. According to the Department of Education and Technology, career education and guidance has three objectives, namely, to help students achieve self-development: to help students explore opportunities for career development and the knowledge and skills needed in research work; and to develop students' career management. to help students make plans suitable for their development. ICT can promote the career education and guidance of higher vocational students by means of video and audio, which is reflected in the following aspects: storing a large amount of information; searching and storing information quickly and accurately; matching information for students: simulating the working environment; updating information quickly; providing a mechanism for information sharing and information exchange.

4.6 The application of ICT in higher vocational curriculum design and development

Excellent higher vocational courses are designed by systematic methods, and need to carry out employment analysis, task analysis, curriculum design and development, teaching design and development and so on. These jobs are very complex, labor-intensive and time-consuming. The application of ICT in the curriculum design and development of higher vocational colleges can simplify and automate the process. Conduct career analysis and skill demand analysis online. The

lack of cutting-edge analysis is a fatal mistake in curriculum development, so job requirements analysis is the basis of curriculum design and development., ICT technology helps to carry out online career analysis and skill demand analysis. Automatic instructional design tools can provide convenience for teachers. The commonly used instructional design tools include expert system (using the platform of knowledge base for teaching decision-making and teaching process analysis), consultation system (these tools can guide designers to carry out instructional design), instructional design environment (this tool can provide instructional design methods, using certain software to solve problems in the real environment, etc.) and so on [8].

5. Conclusion and analysis

According to the above literature analysis, we find that the application of (ICT) in higher vocational education mainly plays an important role in education and teaching technology, students' learning media, higher vocational college management, curriculum design and development and other learning assistance. From the point of view of the application field, it seems to be covered, but through a comparative analysis of the contents of the literature, it is found that people do not want to unify the understanding and application of ICT technology, so it can be concluded that the application of ICT technology actually has many types and forms. At the same time, in the application research of ICT, only the practicability and availability of its technology are analyzed, but the application effectiveness of ICT in various fields of higher vocational education and the comparative benefit analysis with traditional methods are still lacking, especially the comparative analysis of the application effectiveness of ICT technology is not yet mature, which provides a research guidance route for the following ICT research.

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