ICT: its utilization in achieving quality education in Weifang university

Min Wang*, Gertrude V. Corpuz

College of Teacher Education, University of the Cordilleras, Gov. Pack Road, Baguio City, Philippines

*Corresponding author: wmin0528@hotmail.com

Abstract. The rapid development of information and communication technology (ICT) has profoundly changed the development of society. At the same time, it has greatly promoted the progress of society and the transformation of people's production lifestyles. As the last stage of school education, college education shoulders the heavy responsibility of transporting qualified talents for the society. In recent years, with the development of modern information technology, the education and teaching methods of universities have produced profound changes. The fundamental purpose of technology integration into teaching is to improve the effectiveness of teaching by changing teaching methods and optimizing teaching processes. This article uses Weifang University as the research object, and uses a variety of methods such as literature research methods, questionnaires, and interview methods to analyze the current status of ICT in college education and teaching. The study summarized ICT-based teaching in the promotion of quality education in colleges and universities. It analyzed the root cause of these problems and the adverse consequences brought about, and made relevant suggestions for the application of information technology in college education and teaching. This study aims to promote the reform of quality education and teaching of college information and communication technology, promote the use of modern information technology in the education and teaching work of colleges and universities, promote the level of information use of colleges and universities, and improve the quality of talent training in colleges and universities.

Keywords: Information and Communication Technology, ICT-based Teaching, University Classroom, Quality Education.

1. Background

With the rapid development of science and technology and the emergence of informatization, various new methods have appeared. These changes will affect people's daily life and knowledge concepts. Knowledge is no longer a constant objective reality, but a constant generation and change. It requires a personal system.

The development of the times also affects international competition. The demand for talents in various countries has gradually changed, and it pays more attention to innovative talents with inquiry and practical ability. As a gathering place for senior information teaching resources and senior information technology talents, the university played a leading role in the process of realizing educational information. How to effectively use information and communication technology for teaching is the key to measuring teachers' teaching level and teaching quality.

In October 2015, the UNESCO International Internet Education Partner Meeting was held, which clearly proposed to create a digital learning ecosystem. The ecosystem should establish fair, dynamic, responsible and sustainable. "Overview of the Planning of the Mid -term and Long -term Education Reform and Development Exhibition" (2021) emphasized the importance of information technology to the development of education, and requires the height of the education department.

The research of "information and communication technology teaching resources" at home and abroad has a certain foundation, but there are still many problems. First of all, the lack of comprehensiveness of the research object. Most research objects are basically focused on basic education and information teaching resources in the western region, and the use of information resources of university teachers is less. Secondly, the level of research is not deep enough. Most

studies are mainly analyzed from a certain stage of ICT-based teaching. It is difficult to study the comprehensive analysis of teachers and students.

The purpose of this study is to deeply understand the current state of information -based teaching resources in universities and universities, analyze the main problems of using ICT-based teaching resources in universities and universities, and analyze the factors that affect university teachers using ICT teaching resources from multiple levels. In order to cope with the reasons, effective countermeasures were proposed to promote the efficiency of universities' information -based teaching resources. Based on teaching activities, the teachers of the college and university of Weifu City analyzed the current situation of ICT-based teaching resources in the college and the university, looking for reasons from all levels such as society, schools, teachers and other levels and put forward effective countermeasures. In order to enrich and optimize the theoretical system of information -based teaching resources in universities, it provides theoretical reference to promote the development of ICT teaching resources among teachers in the universities.

2. Literature review

Foreign information teaching starts earlier, especially in some developed western countries. With the continuous renewal of information technology and the continuous improvement of the construction of resource management mechanisms, many scholars have begun the research and practice of information technology in the field of education.

Regarding the definition of ICT, the definition of American researchers Lim (2003) and other definitions of ICT is the ability to use techniques for teachers to cultivate learners' thinking [1]. ICT is to use technical tools in the field of education so that learners can use computers and technical skills to learn and solve solutions question.

E Martínez-Caro (2011) Studies show that interaction is the key to successful online learning. The way of human and technical integration is very important. It is also necessary to teach students how to learn online[2]. The research on the effectiveness of information technology teaching mainly mainly inspects the macro level of the school, and has less research from the micro -level of classroom teaching.

Australian scholar Sutherland, Howard and Markauskaite (2010) starts from the concept of digitalization, knowledge carrier, and knowledge tools. It believes that information technology is used to break the form of previous teaching practice in the field of education. In -depth advancement of related research[3] .

British scholars Caird Sally, Caird Sahy, Lane Andy (2015) introduced the widespread application of information technology in British universities, and established a sustainable teaching model[4]. This model uses face -to -face teaching, remote learning and hybrid teaching methods to improve teaching effects.

Russian scholar Pozdniakov and Freiman (2021) conducted a correlation analysis between political changes in Russia and the development of information technology, pointing out that political changes have to some extent stimulated the application of information technology in general education. The article further points out that there is inconsistency in curriculum standards, teacher professional development, and rapid technological changes[5].

Domestic research on information research is relatively late, but in recent years, it has made great progress, and the government has given great support.

The National Internet Information Office (2020) released the "Digital China Development Report (2020)", which mentioned that the degree of opening up and sharing of educational resources has continued to deepen, and digital campus construction has been fully popularized[6]. 98.35 % of teachers with media equipment have been installed in primary and secondary schools. With the promotion of the construction of education informatization 2.0, the investment in the construction of informatization teaching resources has continued to increase.

XIE (2021) has analyzed the classification of informatization teaching resources in the study, and analyzes from the three levels of hardware, software capital, and potential assets. It is believed that current information teaching has problems such as low resource utilization efficiency and lack of construction[7].

Gong and Li (2019) takes the ten universities in Yunnan Province as an example. From the aspect of quantity and influence as an analysis of the entry point, it is found that the use of low efficiency of informatization teaching resources in schools and the low degree of sharing of information teaching resources in inter -school inter -school inter -school inter -school in inter -schools are not high. Furthermore, there are some unbalanced quality and construction quantities of information -based teaching resources in various provinces[8].

Chi and Liu (2021) conducted a study on teaching teachers in vocational colleges and found that teachers' understanding of information technology materials is too simple, leading to insufficient utilization of information technology teaching resources[9].

Study on the above problems in information teaching, research on its influential factors. Wei (2020) investigated the small -scale small -scale schools in nearly a hundred rural areas in Hubei Province, combined with two major perspectives of hardware information teaching resources and software informatization teaching resources, and proposed that hardware facilities and teachers' use of information teaching resources are the biggest factor affecting[10].

Zeng (2019) conducts related research on the frequency of micro -class, audio and other media materials[11]. It is found that although the form of information teaching resources is becoming more and more abundant, the form of information in information teaching resources is relatively single, and then the micro level is proposed. Teachers' informationization Teaching consciousness and their own ability will reduce the use of information resources to a certain extent.

Li and Yang (2021) Starting from the four dimensions of the starting point, process, results, and practice of education informatization, the current status of information technology and educational integration applications of primary and secondary schools in 23 provinces and municipalities across the country. It is proposed that in order to improve the level of informationization, there must be. Perfect equipment management mechanisms, enrich the development path of resource development, accelerate development training, and create a good atmosphere[12].

3. Methodology

This study uses a mixed method. Quantitative use to determine the degree of use of information technology resources for universities. Qualitative research is used to indicate what measures the school has taken in the process of promoting information technology teaching, and what challenges have they encountered in the process of promotion.

Researchers use teachers and students from Weifang University as interviewees to determine the level of teaching based on ICT because they have gone through the entire process of university information construction. Teachers are the executors of information technology teaching, and students are the recipients of information technology teaching. They are the most important part of information technology teaching.

Slove Formula is used to calculate the sample size. The sample includes 293 teachers and 914 students, including education, Chemical engineering, business administration, information engineering, mechanical engineering and other majors. Respondents are shown in the table 1 and table 2 below.

In terms of the effects of ICT-based education and countermeasures that can be taken in the improvement of ICT-based education in Weifang University, the key informants will be selected as the teacher with rich professional knowledge and experience, with a total of 450. These teachers will be recommended by the expert committee of the school's teaching and research group.

Table 1 Number of Respondents(teachers)

Department	Number of teachers	Sample Size
Department of Education	150	57
Department of Chemical Engineering	103	39
Department of Business Administration	206	78
Department of Information Engineering	92	35
Department of Mechanical Engineering	223	84
Total	774	293

Table 2 Number of Respondents(students)

Department	Number of teachers	sample size
Department of Education	1308	175
Department of Chemical Engineering	920	123
Department of Business Administration	1810	242
Department of Information Engineering	810	107
Department of Mechanical Engineering	1980	267
Total	6828	914

4. Conclusion analysis

The following overall conclusions were made based on the questionnaire.

Hardware environment analysis:

After years of construction and development of Weifang University, the construction of the campus network has reached or even exceeds the national requirements. The bandwidth of the campus main network is at the Gigabit or Ten Thousands level. Create a good information teaching environment, and has a large number of multimedia classrooms, electronic double -board classrooms, micro -class classrooms, etc., which basically meets the needs of teachers and students in the school. In addition, there are central computer rooms and data centers with national standard standards to ensure the needs of colleges and universities' teaching, scientific research, and office affairs on the network. This can be seen. The university has established a relatively complete infrastructure environment and has obvious advantages. At present, the university has basically completed the stage of infrastructure construction, and gradually transitions to development and upgrading and deepening its application stage.

At the same time, the university also has difficulty in maintaining and updating equipment to a certain extent. The information infrastructure system of colleges and universities is huge, involving many advanced equipment, and there are greater difficulties in subsequent use, maintenance, and renewal of equipment, and lack of overall planning and management. The university's informatization teaching environment has developed diversified, but it is not balanced. The number of ordinary multimedia classrooms is significantly more than other types of classrooms. The university needs to gradually optimize the information teaching environment. According to the actual needs of the

teaching informatization of colleges and universities, the corresponding digital classrooms to meet students' personalized learning methods.

Software environment analysis:

The construction of the media resource management library has begun to take shape, but the resource sharing level is low. Weifang University has established a media resource management library to store and manage the resources of text, pictures, audio, video, and other resources. The construction of the media resource management library has begun to take shape, and resource development and applications have a high level, but the degree of information circulation between the departments and departments is very low. The university has established a cloud platform for teachers and students of the whole school, and has developed rapidly, but the construction of online courses is relatively weak. The quality of online courses is different, and the number of courses is relatively average. It is difficult to meet the needs of modern teaching to a certain extent. At the same time, the construction of the cloud platform pays too much attention to the construction of technology, pays insufficient attention to the teaching content, lacks scientific theoretical guidance and teaching design, so that some online courses are weak and practical. It is difficult to meet the needs of teaching, and it is difficult to meet the needs of actual teaching.

Potential environmental analysis:

The ICT-based teaching team is well built, but the shortage of ICT-based full -time personnel. Information technology teaching has high requirements for teachers. The university has set up an information technology training team. Since 2013, I have launched ICT-based teaching training for hundreds of backbone teachers each year to focus on the in -depth integration of information technology and education and teaching; Essence

Although the college teachers have undergone a certain amount of ICT-based teaching and training, their information literacy still needs to be improved. The main manifestations are that teachers have low ability to apply information technology in teaching, the types of application teaching resources are not rich enough, and the information awareness is not strong. It is difficult for some college teachers to adapt to the rapid development of information technology.

In order to promote the construction of campus network security, the university has built a relatively stable hardware network security system, which not only guarantees the normal external services of the server system and various applications, but also ensure the threat from the server system itself from the network security attack. At the same time, in order to regulate the Internet behavior of teachers and students of the whole school and protect the security of teachers and students on the Internet, the audit audit system for Internet behavior has been deployed to filter and apply webpage access. In addition, the university has constructed the station group management system. The system is the basic platform of the school's website cluster, which is of great significance for relieving the loopholes of decentralized website and reducing serious security hazards. However, the relevant personnel have insufficient safety awareness, teachers and students of colleges and universities, and various departments of universities need more safety education and safety training.

5. Research suggestions

Optimization strategy of hardware environment:

1. Establish relevant institutions to uniformly purchase, maintain, and supervise ICT equipment.

In order to ensure the effective construction of ICT-based infrastructure, universities should set up relevant institutions to strictly supervise the procurement, use, maintenance and management of ICT devices. Avoid the occurrence of repeated purchases, low equipment usage, and waste of funds. At the same time, colleges and universities should build a professional maintenance department to supervise the usage of ICT-based devices to ensure the effectiveness of the equipment and the service life of the equipment. Establish a scientific evaluation and feedback mechanism to promote the construction of ICT infrastructure in colleges and universities.

2. Build a remote regulatory system for multimedia classrooms. Although the university has built a considerable number of multimedia classrooms, due to the large number of classrooms and dispersion, it is difficult to centralize management and monitoring, resulting in low maintenance response speed and difficulty in maintenance. Therefore, the remote regulatory system of multimedia classrooms should be constructed to realize functions such as real -time supervision, remote listening, and teaching recording.

Optimization strategy of software environment:

Establish a unified application platform to increase resource sharing. Establish a shared link between the application platforms of various departments and departments within the university, while increasing the resource utilization rate while expanding the degree of sharing and scope. Universities can build a unified resource application platform with demand -oriented, upload high -quality digital teaching resources to the resource center database through the network, and the resources are managed in accordance with the "one major, one major and one course" catalog to improve the sharing of resources.

2. At the same time, sharing should not be limited to colleges and universities, and should be expanded to major universities, between universities and enterprises, and between domestic universities and international universities. You can establish a unified teaching resource center in accordance with the principles of multi -party cooperation, complementary advantages, and mutual benefit and mutual benefit, and implement the "knowledge, co -construction, sharing" of teaching resources.

Optimization strategy of potential environment:

1. Improve the introduction and training mechanism of ICT professionals. In response to the current situation of the shortage of ICT full -time personnel in colleges and universities, universities vigorously introduce ICT full -time personnel by improving welfare benefits. Universities can learn from the successful experience of the United States, raise the salary of ICT full -time personnel within a reasonable range, and make their salary slightly higher than the staff at the same level, thereby reducing the gap between the IT industry. At the same time, the management system and training mechanism for the training system and training mechanism of the full -time full -time personnel of ICT are established, and the scale of information technology assessment is continuously expanded.

2. Create a good ICT-based campus atmosphere and raise the awareness of teachers and students. For students to conduct various academic lectures, reports, and public classes related to teaching ICT. Posted on the campus on the campus to post teaching ICT publicity posters and other activities. For teachers' lecture competitions, courseware production competitions, ICT-based training and other activities for the integration of information technology and curriculum. By creating a good ICT campus atmosphere, it has improved the ICT learning consciousness and information technology level of teachers and students in the school.

3. Establish a teacher development center to provide support and services for the development of teachers, thereby improving its ICT-based teaching level. Drawing on the successful experience of the New Media Teaching and Learning Center of Columbia University, teachers develop auxiliary teachers to develop teaching tools and resources with subject characteristics. In this way, in the long -term joint collaboration, the auxiliary teachers will gradually improve the information technology level and consciousness of the theoretical knowledge and practical teaching. In order to gradually optimize the quality of teaching and teaching, it is conducive to the development of teachers' own professionalism. At the same time, a strong ICT-based learning atmosphere was created within the university and between teachers.

4. Establish a comprehensive evaluation and incentive mechanism to fully mobilize the enthusiasm of teachers. For example, colleges and universities can commend the departments and teachers that make special contributions to teaching ICT-based through typical methods, carry out more evaluation and awards activities, and recognize the teaching work and value of teachers, so as to better stimulate the teacher's work enthusiasm and motivation Essence

5. Strengthen information security education and skills training for teachers and students. Information security education and skills training can be adopted to enhance the information security awareness of teachers and students in the school. On the one hand, the learning activities of regularly organizing and carrying out information security laws and regulations, thereby popularizing information security knowledge and improving information security awareness. On the other hand, regularly invite professionals to conduct information security technology training for teachers and students of the school, and learn basic security defense skills.

6. Conclusion

In this study, through actual research on the development of the information of Weifang University, through the processing and calculation of research data, the development status of the development status is analyzed from the positive and negative aspects. Finally, in response to the problems that the university occurs in the process of information technology, I put forward the corresponding optimization strategies, guide colleges and universities to better carry out teaching ICT construction work, and can also provide reference and research on the environmental construction work and research of other universities at the same level of universities at the same level of universities at the same level. refer to.

References

[1] Lim, C. P., Teo, Y. H., Wong, P., Khine, M. S., Chai, C. S., & Divaharan, S.. (2003). Creating a conducive learning environment for the effective integration of ict: classroom management issues. Journal of Interactive Learning Research, 14.

[2] E Martínez-Caro. Factors affecting effectiveness in e-learning: An analysis in productionmanagement courses [J]. Computer Applications in Engineering Education, 2011, 19(19): 572-581.

[3] Sutherland, L., Howard, S., & Markauskaite, L.. (2010). Professional identity creation: examining the development of beginning preservice teachers' understanding of their work as teachers. Teaching & Teacher Education, 26(3), 455-465.

[4] Caird, S., & Lane, A.. (2015). Conceptualising the role of information and communication technologies in the design of higher education teaching models used in the uk.

[5] Pozdniakov, S., & Freiman, V.. (2021). Technology-supported innovations in mathematics education during the last 30years: russian perspective. ZDM – Mathematics Education, 1-15.

[6] Cyberspace Administration of China. (2020). The Cyberspace Administration of China released the Digital China Development Report. http://www.cac.gov.cn/2021-04/29/c_1621275347055808.htm

[7] Xie Guangping (2021). Research on the current situation and management strategy of informatization teaching resources construction in Yining ordinary high schools (Master's Thesis, Yili Normal University) https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1021609712.nh

[8] Gong Yingjing&Li Aijie (2019). Analysis and optimization strategies for the current situation of information technology teaching resource sharing among universities in Yunnan Province Technology Perspective (32), 146-147+145. doi: 10.19694/j.cnki.issn2095-2457.2019.32.067

[9] Chi Zhigang&Liu Yongguo (2021). Analysis and Countermeasure Research on the Current Situation of Informationization Teaching Resource Construction in Technical Colleges China Training (07), 82-84. doi: 10.14149/j.cnki.ct.2021.07.042

[10] Wei Miao (2020). Analysis of Factors Influencing the Efficiency of Informationization Teaching Resource Utilization in Small Rural Schools China's Education Informatization (18), 16-19

[11] Zeng Lulu (2019). Research on the Current Situation and Analysis of Influencing Factors of the Application of Informationization Teaching Resources for Foreign Trade English in Higher Vocational Education Inner Mongolia Education (05), 6-8

[12] Li Yi and Yang Haoxuan (2022). The Dilemma and Countermeasures of Informationization Development in Urban and Rural Compulsory Education Journal of Educational Science of Hunan Normal University (03), 97-108+114 Doi: 10.19503/j.cnki.1671-6124.2022.03.010