Science, Technology and Social Sciences Procedia
2021; 2021(1): acm015
https://wjst.wu.ac.th/index.php/stssp

# Barriers Perceived by Teachers Regarding the Use of Distance Education Technologies for Adult Higher Education

**Jia Liang[1,*] and Pongpan Compan[2]**

*[1]College of Graduate Studies, Walailak University, Nakhon Si Thammarat 80160, Thailand*
*[2]School of Management, Walailak University, Nakhon Si Thammarat 80160, Thailand*

**([*]Corresponding author's e-mail: 44628856@qq.com)**

## Abstract

The paper aimed to analyze the barriers perceived by teachers regarding the use of distance education for adult higher education and to suggest the solution to improve distance education for adult higher education. The research used Rogers's innovation diffusion theory as a conceptual framework. The article mainly extracts 10 factors that refer to Nelson and Thompson (2005) as follow; 1) administrative structure, 2) organization change, 3) technical expertise, support, and infrastructure, 4) social interaction and program quality, 5) faculty compensation and time, 6) treat of technology, 7) legal issues, 8) evaluation effective, 9) assess, and 10) student support services. The population comes from the teachers who attend the project of adult correspondence education informatization of the author's Unit-Beijing Open Distance Education Center Co., Ltd. Beijing University of Chemical Technology, North China University of Technology, Jinzhou Medical University, and the above 3 universities may be available to adults in the 2021 - 2022 semester. There are 250 teachers who teach correspondence education. According to the Krejcie and Morgan sample survey, the sample size is 162 teachers. The basic information includes gender, age, highest degree, major, working years, online teaching experience, teacher subject area, online teaching training. This research found that the teachers agree that the most barrier to distance education technology was the student-support services, evaluation effectiveness, and faculty compensation and time. And the treat of technology was neutral. The suggestion was to develop the network course, especially in the late innovation of the critical position, to promote resource sharing and knowledge sharing.

**Keywords:** Barriers, Distance education technology, Adult higher education

## Background of the study

Adult higher education is an important part of higher education. With the development of internet information technology, a wave of new technological revolutions has emerged around the world, and it has had a profound impact on China's higher education. Higher education will learn from teaching content, teaching purposes, teaching methods, and the organization and management of teaching. Fundamental changes have taken place in other aspects (Yongqun & Liu, 1999), forming a modern Chinese distance education oriented to social adult higher education with online interactive learning as the main feature, satisfying students' desire to learn from time to time, everywhere, and for everyone and demand. Since then, China has gradually formed an adult higher education system based on 3 forms of traditional correspondence education, open education, and online education. On the one hand, distance education has received more and more attention in China, which has greatly promoted the development of information technology and higher education. The integrated application has made a significant contribution to the improvement of the gross enrollment rate of higher education, promoted the development and reform of higher education, and made higher education move from the stage of popularization to the stage of popularization. On the other hand, there are still more than 2,000 correspondence education colleges in China. Every year, nearly 3 million students use face-to-face instruction. Non-face-to-face instruction in some colleges and universities is only completed by

asynchronous communication methods such as video recording and broadcasting courseware and PPT. Educational colleges and universities have weak teaching resources, low informatization literacy of teachers, and a low level of informatization in education.

Educational informatization is an important means to realize the modernization of education. The National Medium and Long-term Educational Reform and Development Plan (2010 - 2020) proposes: Information technology has a revolutionary impact on educational development and must be highly valued by 2020, it will be basically completed cover the educational information system of all types of schools at all levels in urban and rural areas, and promote the modernization of educational content, teaching methods and methods. The "Ten-Year Development Plan for Education Informatization (2011-2020)" mentioned that China's educational informatization has made significant progress, but there is still a significant gap compared with the needs of the people and the level of developed countries in the world. It is necessary to fully understand the promotion of education. The importance and arduousness of informatization, take education informatization as the strategic focus and priority area of national informatization, comprehensively deploy and accelerate the implementation, mobilize the active support and participation of the whole society, and take about 10 years to initially establish a Chinese-characteristics the education informatization system has brought China's education informatization as a whole close to the international advanced level and promoted the scientific development of education. In 2017, the national education development "13$^{th}$ 5-Year Plan" pointed out: Fully promote the deep integration of information technology and education and teaching. Encourage teachers to use information technology to improve teaching levels, innovate teaching models, and use flipped classrooms, mixed teaching and other methods make good use of high-quality digital resources. Guide schools and teachers to rely on the online learning space to record the learning process of students, conduct comprehensive teaching analysis, and innovate teaching management methods. In 2018, adult higher education should sum up experience and actively promote internet + education, adhere to the in-depth integration of information technology and education and teaching, and build a lifelong learning system for all people and learning that can be learned at all times and everywhere. Society. The new crown epidemic broke out suddenly in 2020. Director of the Department of Higher Education of the Ministry of Education, concluded that Non-online teaching will no longer be just an auxiliary teaching method, but an important teaching method. Online education will become normal (Wu, 2020).

Whether it is traditional face-to-face teaching in the past or online teaching in the information age, teachers have always been the main body of education and teaching, playing a key and irreplaceable role (Li & Lindner, 2005). However, teachers participating in online teaching will facing many obstacles. Early research pointed out that many teachers are always worried about being replaced by computers (Berge, 1998); teachers cannot distinguish whether the teaching effects of face-to-face and online teaching are the same; they are not familiar with the operation of the technology platform and cannot solve the technical problems that suddenly occur in the class, which is not conducive to course continuation and worry that students' evaluation of teachers' abilities is not high; network instability will interrupt teachers' online teaching and affect the continuity of teachers' and students' teaching ideas; even when many colleges and universities have just introduced computers, they have adopted strict measures on expensive computer equipment. The management system restricts the ability of teachers to use information technology platforms to carry out teaching and so on. With the upgrading and iteration of information technology and the successful practice of online education in China, the use of online teaching will encounter deeper problems and new obstacles. For example, the teacher's information literacy and skill training system is not perfect; There is a gap in the performance of conventional education (Miller, 2018); the lack of good communication between teachers and students and the inability to motivate each other between students and students; the security capabilities of information platforms are weak, and teacher teaching process sharing through social media will affect teachers' intellectual property rights Protection, the integration of VR, AR and other new technologies with education and teaching, etc.

## Problem statement

The main units of correspondence education in China are adult education colleges in general universities, with 2,104 colleges and universities. Correspondence education is mainly based on self-study by students, supplemented by face-to-face instruction by teachers, and professional teaching plans and syllabuses are implemented full-time. The existing teachers and various teaching facilities should be fully utilized to carry out correspondence teaching. Therefore, correspondence education has a unique system, and there are no full-time teachers. The teachers are mainly recruited from other professional secondary colleges or rely on off-campus correspondence education sites. In recent years, with the continuous advancement of distance education technology, although correspondence education colleges and universities are actively participating in the construction of informatization, they only pay attention to the improvement of technical platforms, network teaching resources, and other hardware conditions, and invest in teachers' informatization literacy and skills.

Due to the continuous deepening of educational informatization policy requirements and the successful practice of online education in China, the state encourages correspondence education colleges to accelerate the progress of educational informatization construction, establish and improve online teaching management for adult higher education. The organic integration of "online plus offline" and the improvement of the online teaching model of correspondence education is an important research direction. This is an important research direction to help determine the various barriers to distance education, improve teaching quality, and enhance adult higher education. The social recognition of educational qualifications has a great promotion effect, which will inevitably pose a huge challenge to college teachers.

Through literature review and investigation, this paper determines the obstacles that hinder the expansion of distance education technology in adult higher education to teachers in correspondence education colleges and universities. At the same time, the author hopes to have a better understanding of the future development of Distance education in China, especially the role and quality of distance education teachers required by these future trends, by combing the historical evolution track and future development trend of distance education at home and abroad from the perspective of international comparison. Through the questionnaire survey and interview of all full-time teachers in an Open University, the realistic basis of the role transformation of teachers in China's open and distance education system is better understood, especially the present situation and demand of distance education teachers' literacy standard in China. Last but not least, combining some relatively mature experience in the world provides some suggestions for the improvement of distance education teachers' quality in China.

## Research objectives

The objective of this study are as follows; 1) to analyze the barrier perceived by teachers regarding the use of distance education technologies for adult higher education, and 2) to suggest the solution to improve the distance education technology for adult higher education.

## Definition of terms

**Adult higher education** is a higher education level of higher education for working or non-working adults who meet the prescribed standards. It is of the nature of continuing education (including vocational training). Compared with ordinary higher education, it aims to meet the needs of adults to improve their own quality. Or adapting to the needs of occupations is also one of the ways to expand higher education opportunities and cultivate specialized talents: It is characterized by diversified forms of running schools and teaching; teaching methods are divided into face-to-face, correspondence, and teaching using radio, television and other means; teaching content Including vocational training, systematic professional education that can obtain a certain academic certificate, or general or specialized courses selected according to different interests and purposes of individuals, and the study period is flexible, ranging from several weeks to several years. In this article, since online education and open education have a relatively

high degree of informatization, they will not be studied. Therefore, adult higher education specifically refers to the type of education in which the teaching form is correspondence.

**Distance education or distance learning** is a field of education that focuses on the pedagogy, technology, and instructional systems design that is effectively incorporated in delivering education to students who are not physically "on site" to receive their education. Instead, teachers and students may communicate asynchronously (at times of their own choosing) by exchanging printed or electronic media, or through technology that allows them to communicate in real time (synchronously).

**Barrier to distance education** is an obstacle that hinders access or movement the distance education. The 10 factors extract and named in this study follow; 1) administrative structure, 2) organization change, 3) technical expertise, support, and infrastructure, 4) social interaction and program quality, 5) faculty compensation and time, 6) treat of technology, 7) legal issues, 8) evaluation effective, 9) assess, and 10) student support services.

**Technology** is equipment and machinery mainly designed through the application of scientific knowhow.

## Literature review

Research on related issues in education technology abroad usually focuses on the use of innovation diffusion theory. This study will also use Rogers's (1995) innovation diffusion theory as a research framework for research on distance education technology adoption. As a new concept in the information revolution of the 20$^{th}$ century, distance education technology will be continuously transmitted to the following or several units in this informationized social system as time goes by. Although China has been practicing online education for 2 decades, according to the statistics of the Ministry of Education in 2019 and the "Statistical Indicators System for Educational Monitoring and Evaluation in China" in 2020, it can be learned that there are approximately 1.22 million teachers in ordinary colleges and universities across the country. The ratio of teachers in education is less than 10 %, and distance education technology is still being promoted as an innovative thing in adult correspondence education. At the same time, under the policy requirements of China's education informatization, we must confirm 3 crucial premises. Educational institutions or universities support distance education projects, teachers are the core of online teaching, and teachers are actively involved in innovative perception.

Time factors influence the diffusion of innovation, and the spread of new things from knowledge to acceptance is divided into the stages of cognition, persuasion, decision-making, implementation, and confirmation. The obstacles teachers feel when using distance education technology correspond to the decision-making stage of innovative decision-making theory. This article mainly extracts 10 factors (Nelson & Thompson, 2005) as follows; 1) administrative structure, 2) organization change, 3) technical expertise, support, and infrastructure, 4) social interaction and program quality, 5) faculty compensation and time, 6) treat of technology, 7) legal issues, 8) evaluation effective, 9) assess, and 10) student support services. The factors confirm the barriers felt by teachers to use distance education technology in adult higher education determine whether teachers can use distance education technology and raise the issue of hindering the expansion of online teaching. The conceptual framework is as follow;

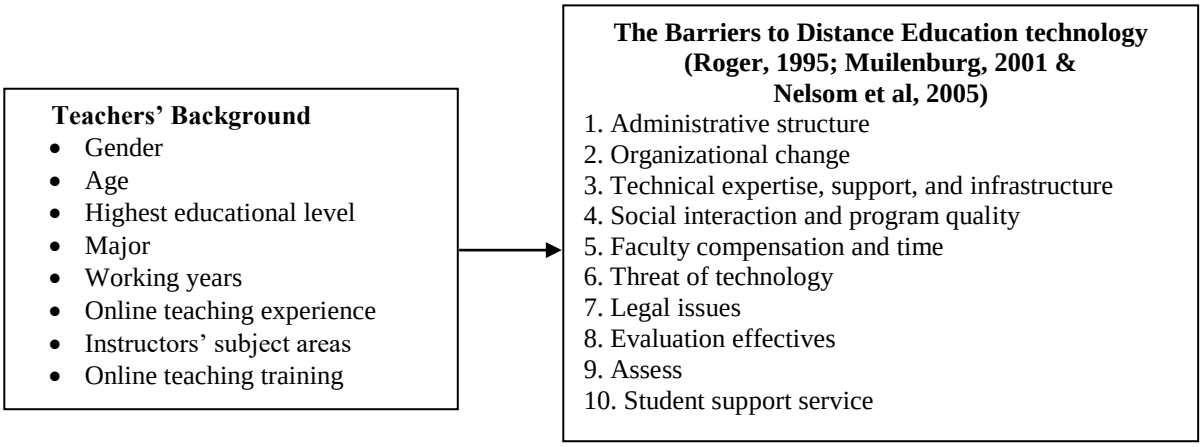


**Figure 1** Conceptual framework.

## Methodology

According to Welman and Kruger (1999), the research design is a blueprint for conducting research. It deals with maximum control of all external factors that might affect a research process. This research will employ a descriptive survey research design by using quantitative research design. According to Orodho (2009), the survey is a data collection method that employs questionnaires administered to a selected sample of respondents to investigate barriers perceived by the teacher regarding the use of distance education technologies for higher education. The descriptive survey analyzes educational problems to report and determine the way things happen in society. In this research, the researcher seeks to investigate online teaching barriers by getting concise information and making deductive conclusions on the research topic.

A descriptive survey is the best approach for researching social sciences intended at collecting original data and using the data contained in making decisions based on the entire population directly. Therefore, the researcher will use quantitative research designs in investigating the barriers perceived by teachers in distance education for adults. Furthermore, the researcher will use both approaches to minimize limitations brought by each method and maximize their strength.

### Subjects

The research object of this article is college teachers who carry out adult correspondence education in ordinary colleges and universities across the country. According to the statistics of the Ministry of Education in 2019, there are a total of 1,225,310 teachers. The universities surveyed in this article come from the adult correspondence education informatization project of the author's Unit-Beijing Open Distance Education Center Co., Ltd. They are Beijing University of Chemical Technology, North China University of Technology, Jinzhou Medical University, and the above 3 universities may be available to adults in the 2021 - 2022 semester. There are 250 teachers who teach correspondence education. According to the Krejcie and Morgan (1970) sample survey, the sample size is 162 teachers. The basic information includes gender, age, highest degree, major, working years, online teaching experience, teacher subject area, online teaching training, etc.

### Reliability and validity of the instrument

Researchers use questionnaire survey tools to collect information about respondents. The project designed for this study reflects the 9 barriers that teachers feel when using distance education technology, including faculty attitudes and resistance to distance education, lack of personal contact, lack of faculty time and support, technology issues, lack of student services, institutional culture, legal concerns, regulatory restrictions, and expense. To establish the reliability of the content of obstacle factors in the questionnaire, 3 experts reviewed each obstacle factor, they were Ms. Su Jie, Professor, Liaoning University of Traditional Chinese Medicine; Mr. Lu Junjie, Northeastern University, Dean of the School

of Online Education; Beijing Jiaotong University Mr. Chen Geng, Professor, Deputy Secretary-General of the Modern Distance Education Cooperation Group. The above 3 experts have been engaged in online education for many years and have expertise in online education management.

Before sending the questionnaire to 152 teachers in 3 universities, the researchers will take a small sample of teachers from colleges and universities for testing and research, to confirm the friendliness and reliability of the research tools selected by the researchers, and to ensure that the data collection process. The medium tool is stable and easy to use. The alpha coefficients of 9 obstacle factors we extracted are at least greater than 0.6 to confirm the credibility of these problems. The selected research tools can be used in the data collection process of this research. These research tools are expected to provide researchers with accurate information about this study. Researchers will use the research work used in the final data collection to determine its reliability, and the number of samples selected in the pilot study will not be collected. Data.

### Data analysis techniques

Data analysis is making the research findings relevant to the topic of research from their unusable form to understandable units. Once the researcher has collected all the relevant data from the respondents, this data will be screened to eliminate any biased and not responded questionnaires to increase findings accuracy. The filtered data will be coded into the Statistical Package for Social Sciences (SPSS). This data will then be arranged according to the research questions for more straightforward analysis. Therefore, the researcher will summarize the research findings in pie charts, bar graphs, and distribution tables for all the research components.

The data collected from the questionnaires will be grouped and arranged in their level of relevance. Then, the researcher will organize, tabulate and analyze the findings in frequency tables. These tables will include percentages and ratios of the results to facilitate research conclusions. Rates are considered in this research since they provide considerable advantages over using complex statistical measures.

The researcher will also focus on the t-teat and ANOVA. This analysis method will help the researcher in testing the significance of the survey conducted and help in upholding and rejecting the research hypothesis. The researcher will also conduct a t-test in the data collected to help in determining the significance between the independent and the dependent variables. These distributional values will help the researcher in determining the degree of freedom of the collected data.

## Results

### Teachers' background

Descriptive analysis sets describe the teachers' backgrounds that show in the **Table 1**. The data of questionnaire survey are processed by statistical software. **Table 1** shows the teachers' backgrounds. Among them, 8 % are between 20 and 30 years old, 39.5 % are between 31 and 40, 40.7 % are between 41 and 50, and 11.7 % are between 51 and 60 years old and above. It can be seen that teachers aged 41 - 50 years old constitute the leading force in rural primary and secondary school teachers. Therefore, they will naturally become the main object of network education. It is understood that most of the teachers in this age group have much teaching experience, but due to the long interval between the time they entered teaching and the present time, and the limitations of the whole problem of teacher re-education, as well as the increasing burden of teachers in this group and many other factors. As a result, in receiving online education, they have the mentality of resistance to online education under the new situation because of their weak professional foundation and limited learning ability. Therefore, in the implementation of network education, we should pay attention to teaching students according to their aptitude from all aspects and tailor the network education content or method in line with teachers' development characteristics and needs according to local conditions. At the same time, we should carry out reasonable management. Only in this way can we achieve good results.

The teacher's teaching age reflects the teacher's rich teaching experience and reflects the degree of teacher's job burnout to a certain extent. From the perspective of the survey, this survey considers teachers with less than 5 years of teaching experience as new teachers, 6 - 10 years of teaching experience

as young teachers, 11 - 20 years of teaching experience as middle-aged teachers, and more than 21 years of teaching experience as old teachers. Middle-aged teachers account for nearly half (47 %) of all teachers (this is consistent with the above age structure of teachers). As work and life tend to be stable in this group, the teaching task is highly cyclical, and there is no significant breakthrough. Therefore, the phenomenon of job burnout of teachers in this part will naturally occur. This phenomenon is very unfavorable for teachers to accept new learning methods or new knowledge. In addition, as new teachers are relatively strong in accepting new things and are familiar with the network, it is much easier for them to use the network to receive re-education. But the proportion of this group in rural teachers is not much. In this survey, it is found that new teachers account for the total number of teachers, which indicates that in rural primary and secondary schools, the problem of young teachers has been alleviated to a certain extent because of the particular post teacher policy implemented in China in the past 2 years. But this is only temporary the rural areas need a group of outstanding teachers, but due to the backward economy, culture, and geographical environment is terrible, the influence of such factors as the introduction of new teachers not only become a complex problem, at the same time, the original teachers often appear a large number of loss, which seriously affected the healthy development of teachers.

To some extent, the different levels of teachers' academic qualifications reflect the additional knowledge structures of teachers. As can be seen from the table, teachers with bachelor's degrees accounted for 89.5 % of the total number of teachers in this survey. And teachers with technical secondary school or secondary teachers and college degrees accounted for 10.5 % of the total. Our network education based on improving the overall quality of teachers also includes improving the educational level of teachers. In the development of the whole network education, teachers' existing academic levels should also be considered within the scope. On the one hand, because of the current situation of weak educational background, the network education among teachers should focus on promoting teachers' educational experience. On the other hand, network education should be carried out according to teachers' individual acceptance ability and knowledge structure to carry out diversified network education.

The metaphor of the teacher learning community emphasizes that teachers need to grow in cooperation. The knowledge sharing of the teacher community is mainly realized through cooperative dialogue activities, thus promoting teachers' collective professional growth. Therefore, compared with the short-term, closed learning mode of training, which focuses on knowledge and skill indoctrination, teacher learning community is more likely to make teachers change from closed to open, from single to diverse, from unified organization to independent construction, and from passive acceptance to knowledge sharing. However, from the investigation, the actual help degree of teaching and research activities to teacher development is not as good as expected. The results from the interview also reveal some problems existing in the current teaching and research activities, which can be summarized as follows: education and research activities have a single content, low relevance to teaching improvement, mainly limited to examination and management; in teaching and research activities, there is a link of class evaluation, but only "listening" without "evaluation", it is difficult to improve teaching effectiveness.

**Table 1** Teachers' background.

| Teachers' background | Frequency | Percent |
|---|---|---|
| **Gender** | | |
| Male | 73 | 45.1 |
| Female | 89 | 54.9 |
| **Current age** | | |
| 20 - 30 years | 13 | 8.0 |
| 31 - 40 years | 64 | 39.5 |
| 41 - 50 years | 66 | 40.7 |
| 51 - 60 years | 19 | 11.7 |

| Teachers' background | Frequency | Percent |
|---|---|---|
| **Education** | | |
| College | 17 | 10.5 |
| Undergrad | 66 | 40.7 |
| Master | 57 | 35.2 |
| Doctor | 22 | 13.6 |
| **Years of experience teaching** | | |
| Less than 5 years | 31 | 19.1 |
| 5 - 10 years | 41 | 25.3 |
| 11 - 15 years | 55 | 34.0 |
| 16 - 20 years | 21 | 13.0 |
| more than 20 years | 14 | 8.6 |
| **Major** | | |
| Technology | 42 | 25.9 |
| Engineering | 15 | 9.3 |
| Business | 18 | 11.1 |
| Economics | 49 | 30.2 |
| Humanity | 25 | 15.4 |
| Art | 12 | 7.4 |
| Journalism | 1 | 0.6 |
| **Online experience** | | |
| Yes | 124 | 76.5 |
| No | 38 | 23.5 |
| **Online teaching tanning** | | |
| Yes | 134 | 82.7 |
| No | 28 | 17.3 |

**The barriers perceived by teachers regarding the use of distance education technologies for adult higher education**

The teachers agree with the most barrier to distance education technology were the student –support services (M = 3.8827, SD = 0.7132), followed by the evaluation effective (M = 3.8426, SD = 0.7233), faculty compensation and time (M = 3.8395, SD = 0.7991), legal issues (M = 3.7572, SD = 0.7623), social interaction and program quality (M = 3.7469, SD = 0.6847), assess (M = 3.6481, SD = 0.80928), organizational change (M = 3.6440, SD = 0.7960), technical expertise, support, and infrastructure (M = 3.6379, SD = 0.80577), and administrative structure (M = 3.5725, SD = 0.6969), respectively. The teachers agree with the treat of technology is neutral barrier to distance education technology (M = 3.1944, SD = 1.0264).

**Table 2** Mean and Standard Deviation of the barriers perceived by teachers regarding the use of distance education technologies for adult higher education.

| The barriers to distance education technology | N | Mean | Std. Deviation |
|---|---|---|---|
| Administrative structure | 162 | 3.5725 | 0.6969 |
| Organizational change | 162 | 3.6440 | 0.7960 |
| Technical expertise, support, and infrastructure | 162 | 3.6379 | 0.8057 |
| Social interaction and program quality | 162 | 3.7469 | 0.6847 |
| Faculty compensation and time | 162 | 3.8395 | 0.7991 |
| Threat of technology | 162 | 3.1944 | 1.0264 |

| The barriers to distance education technology | N | Mean | Std. Deviation |
|---|---|---|---|
| Legal issues | 162 | 3.7572 | 0.7623 |
| Evaluation effectives | 162 | 3.8426 | 0.7233 |
| Assess | 162 | 3.6481 | 0.8092 |
| Student - support services | 162 | 3.8827 | 0.7132 |

**Paired sample of the barriers perceived by teacher regarding the use of distance education technologies for adult higher education**

The independent sample t-test in **Table 3** shows the barriers perceived by teachers regarding the use of distance education technologies that were no significantly differed between gender and online teaching experience. However, the administrative structure and technical expertise, support, and infrastructure were significant difference between teachers' gender (t = 2.404, $p$ = 0.017 and t = 2.407, $p$ = 0.017).

**Table 3** Paired sample t-test of the barriers perceived by teacher regarding the use of distance education technologies between gender and online teaching experience.

| The barriers to distance education technology | Gender | | t | *p* | Online teaching experience | | t | *p* |
|---|---|---|---|---|---|---|---|---|
| | Male | Female | | | Yes | No | | |
| Administrative structure | 3.71 | 3.45 | 2.404 | 0.017* | 3.61 | 3.42 | 1.538 | 0.126 |
| Organizational change | 3.73 | 3.56 | 1.323 | 0.188 | 3.67 | 3.54 | 0.886 | 0.337 |
| Technical expertise, support, and infrastructure | 3.80 | 3.50 | 2.407 | 0.017* | 3.62 | 3.67 | −0.328 | 0.744 |
| Social interaction and program quality | 3.84 | 3.66 | 1.616 | 0.108 | 3.76 | 3.70 | 0.441 | 0.660 |
| Faculty compensation and time | 3.93 | 3.76 | 1.330 | 0.185 | 3.86 | 3.75 | 0.788 | 0.432 |
| Threat of technology | 3.36 | 3.05 | 1.909 | 0.058 | 3.16 | 3.28 | −0.651 | 0.516 |
| Legal issues | 3.80 | 3.71 | 0.770 | 0.442 | 3.79 | 3.64 | 0.999 | 0.319 |
| Evaluation effectives | 3.89 | 3.79 | 0.871 | 0.385 | 3.88 | 3.69 | 1.419 | 0.158 |
| Assess | 3.69 | 3.61 | 0.620 | 0.536 | 3.66 | 3.59 | 0.487 | 0.627 |
| Student - support services | 3.98 | 3.79 | 1.740 | 0.084 | 3.93 | 3.72 | 1.578 | 0.116 |

**$p < 0.01$, *$p < 0.05$

**Table 4** shows the result of a 1-way ANOVA analysis of variance to evaluate the relationship between the barriers perceived by teachers regarding the use of distance education technologies and teachers' age groups. The teachers' age group was an independent variable that included 4 levels, between 20 - 30, 31 - 40, 41 - 50 and 51 - 60 years. The dependent variable was the barriers to distance education technology. The ANOVA was almost no significant relationship. However, the threat of technology was significant relationship with teachers' age group (F = 3.518, $p$ = 0.017).

**Table 4** One-way ANOVA test for comparison of the barriers perceived by teacher regarding the use of distance education technologies and teachers' age groups.

| The barriers to distance education technology | Age groups | SS | df | MS | F | *p* |
|---|---|---|---|---|---|---|
| Administrative structure | Between Groups | 2.329 | 3 | 0.776 | 1.616 | 0.188 |
| | Within Group | 75.882 | 158 | 0.480 | | |
| | Total | 78.210 | 161 | | | |
| Organizational change | Between Groups | 0.683 | 3 | 0.228 | 0.355 | 0.786 |
| | Within Group | 101.345 | 158 | 0.641 | | |
| | Total | 102.028 | 161 | | | |
| Technical expertise, support, and infrastructure | Between Groups | 0.978 | 3 | 0.326 | 0.497 | 0.685 |
| | Within Group | 103.554 | 158 | 0.655 | | |
| | Total | 104.532 | 161 | | | |
| Social interaction and program quality | Between Groups | 1.065 | 3 | 0.355 | 0.753 | 0.522 |
| | Within Group | 74.434 | 158 | 0.471 | | |
| | Total | 75.498 | 161 | | | |
| Faculty compensation and time | Between Groups | 2.166 | 3 | 0.722 | 1.134 | 0.337 |
| | Within Group | 100.661 | 158 | 0.637 | | |
| | Total | 102.827 | 161 | | | |
| Threat of technology | Between Groups | 10.620 | 3 | 3.540 | 3.518 | 0.017* |
| | Within Group | 159.005 | 158 | 1.006 | | |
| | Total | 169.625 | 161 | | | |
| Legal issues | Between Groups | 1.751 | 3 | 0.584 | 1.005 | 0.392 |
| | Within Group | 91.810 | 158 | 0.581 | | |
| | Total | 93.561 | 161 | | | |
| Evaluation effectives | Between Groups | 0.591 | 3 | 0.197 | 0.372 | 0.773 |
| | Within Group | 83.645 | 158 | 0.529 | | |
| | Total | 84.236 | 161 | | | |
| Assess | Between Groups | 2.695 | 3 | 0.898 | 1.382 | 0.250 |
| | Within Group | 102.749 | 158 | 0.650 | | |
| | Total | 105.444 | 161 | | | |
| Student-support services | Between Groups | 1.895 | 3 | 0.632 | 1.247 | 0.295 |
| | Within Group | 80.002 | 158 | 0.506 | | |
| | Total | 81.897 | 161 | | | |

**$p < 0.01$, *$p < 0.05$

**Table 5** shows the result of a 1-way ANOVA analysis of variance to evaluate the relationship between the barriers perceived by the teachers regarding the use of distance education technologies and teachers' education background. The teachers' education background was an independent variable that included 4 levels: College, Undergrad, Master and Doctor. The dependent variable was the barriers to distance education technology. The ANOVA was almost no significant relationship. However, the administrative structure, organizational change, and threat of technology were significant relationship with teachers' background (F = 6.491, $p = 0.000$; F = 4.136, $p = 0.007$; F = 4.298, $p = 0.006$).

**Table 5** One-way ANOVA Test for comparison of the barriers perceived by teacher regarding the use of distance education technologies and teachers' education background.

| The barriers to distance education technology | Education | SS | df | MS | F | *p* |
|---|---|---|---|---|---|---|
| Administrative structure | Between Groups | 8.582 | 3 | 2.861 | 6.491 | 0.000** |
| | Within Group | 69.628 | 158 | 0.441 | | |
| | Total | 78.210 | 161 | | | |
| Organizational change | Between Groups | 7.429 | 3 | 2.476 | 4.136 | 0.007** |
| | Within Group | 94.599 | 158 | 0.599 | | |
| | Total | 102.028 | 161 | | | |
| Technical expertise, support, and infrastructure | Between Groups | 4.895 | 3 | 1.532 | 2.422 | 0.068 |
| | Within Group | 99.936 | 158 | 0.633 | | |
| | Total | 104.532 | 161 | | | |
| Social interaction and program quality | Between Groups | 0.277 | 3 | 0.092 | 0.194 | 0.900 |
| | Within Group | 75.221 | 158 | 0.476 | | |
| | Total | 75.498 | 161 | | | |
| Faculty compensation and time | Between Groups | 3.244 | 3 | 1.081 | 1.716 | 0.166 |
| | Within Group | 99.583 | 158 | 0.630 | | |
| | Total | 102.827 | 161 | | | |
| Threat of technology | Between Groups | 12.799 | 3 | 4.266 | 4.298 | 0.006** |
| | Within Group | 156.826 | 158 | 0.993 | | |
| | Total | 169.625 | 161 | | | |
| Legal issues | Between Groups | 0.620 | 3 | 0.207 | 0.351 | 0.788 |
| | Within Group | 92.941 | 158 | 0.588 | | |
| | Total | 93.561 | 161 | | | |
| Evaluation effectives | Between Groups | 0.839 | 3 | 0.280 | 0.530 | 0.662 |
| | Within Group | 83.397 | 158 | 0.528 | | |
| | Total | 84.236 | 161 | | | |
| Assess | Between Groups | 3.462 | 3 | 1.154 | 1.788 | 0.152 |
| | Within Group | 101.983 | 158 | 0.645 | | |
| | Total | 105.444 | 161 | | | |
| Student-support services | Between Groups | 2.867 | 3 | 0.956 | 1.991 | 0.130 |
| | Within Group | 79.030 | 158 | 0.500 | | |
| | Total | 81.897 | 161 | | | |

**$p < 0.01$, *$p < 0.05$

**Table 6** shows the result of a 1-way ANOVA analysis of variance to evaluate the relationship between the barriers perceived by the teachers regarding the use of distance education technologies and teachers' experience. The teachers' experience was an independent variable that included 5 groups: Less than 5 years, 5 - 10, 11 - 15, 16 - 20, and more than 20 years. The dependent variable was the barriers to distance education technology. The ANOVA was no significant relationship between the barriers to distance education technology and teachers' experience.

**Table 6** One-way ANOVA Test for comparison of the barriers perceived by teacher regarding the use of distance education technologies and teachers' experience.

| The barriers to distance education technology | Experience | SS | df | MS | F | P |
|---|---|---|---|---|---|---|
| Administrative structure | Between Groups | 2.358 | 4 | 0.589 | 1.220 | 0.305 |
| | Within Group | 75.853 | 157 | 0.483 | | |
| | Total | 78.210 | 161 | | | |
| Organizational change | Between Groups | 2.524 | 4 | 0.631 | 0.996 | 0.412 |
| | Within Group | 99.504 | 157 | 0.634 | | |
| | Total | 102.028 | 161 | | | |
| Technical expertise, support, and infrastructure | Between Groups | 0.771 | 4 | 0.193 | 0.292 | 0.883 |
| | Within Group | 103.761 | 157 | 0.661 | | |
| | Total | 104.532 | 161 | | | |
| Social interaction and program quality | Between Groups | 1.924 | 4 | 0.481 | 1.026 | 0.396 |
| | Within Group | 73.575 | 157 | 0.469 | | |
| | Total | 75.498 | 161 | | | |
| Faculty compensation and time | Between Groups | 1.469 | 4 | 0.367 | 0.569 | 0.686 |
| | Within Group | 101.358 | 157 | 0.646 | | |
| | Total | 102.827 | 161 | | | |
| Threat of technology | Between Groups | 9.429 | 4 | 2.357 | 2.310 | 0.060 |
| | Within Group | 160.196 | 157 | 1.020 | | |
| | Total | 169.625 | 161 | | | |
| Legal issues | Between Groups | 0.564 | 4 | 0.141 | 0.238 | 0.916 |
| | Within Group | 92.997 | 157 | 0.592 | | |
| | Total | 93.561 | 161 | | | |
| Evaluation effectives | Between Groups | 0.725 | 4 | 0.181 | 0.341 | 0.850 |
| | Within Group | 83.511 | 157 | 0.532 | | |
| | Total | 84.236 | 161 | | | |
| Assess | Between Groups | 1.066 | 4 | 0.267 | 0.401 | 0.808 |
| | Within Group | 104.378 | 157 | 0.665 | | |
| | Total | 105.444 | 161 | | | |
| Student-support services | Between Groups | 0.994 | 4 | 0.248 | 0.482 | 0.749 |
| | Within Group | 80.903 | 157 | 0.515 | | |
| | Total | 81.897 | 161 | | | |

**$p < 0.01$, *$p < 0.05$

**Table 7** shows the result of a 1-way ANOVA analysis of variance to evaluate the relationship between the barriers perceived by the teachers regarding the use of distance education technologies and teachers' major of teaching. The teachers' major of teaching was an independent variable that included 7 majors: Technology, engineering, business, economics, humanity, art and journalism. The dependent variable was the barriers to distance education technology. The ANOVA was almost no significant relationship. However, the administrative structure, technical expertise, support, and infrastructure were significant relationship with teachers' major of teaching (F = 3.800, $p = 0.001$; F = 2.525, $p = 0.023$; F = 2.679, $p = 0.017$).

**Table 7** One-way ANOVA Test for comparison of the barriers perceived by teacher regarding the use of distance education technologies and teachers' major of teaching.

| The barriers to distance education technology | Major of teaching | SS | df | MS | F | *p* |
|---|---|---|---|---|---|---|
| Administrative structure | Between Groups | 10.030 | 6 | 1.672 | 3.800 | 0.001** |
| | Within Group | 68.180 | 155 | 0.440 | | |
| | Total | 78.210 | 161 | | | |
| Organizational change | Between Groups | 6.588 | 6 | 1.098 | 1.783 | 0.106 |
| | Within Group | 95.440 | 155 | 0.616 | | |
| | Total | 102.028 | 161 | | | |
| Technical expertise, support, and infrastructure | Between Groups | 9.307 | 6 | 1.551 | 2.525 | 0.023* |
| | Within Group | 95.225 | 155 | 0.614 | | |
| | Total | 104.532 | 161 | | | |
| Social interaction and program quality | Between Groups | 3.756 | 6 | 0.626 | 1.352 | 0.237 |
| | Within Group | 71.743 | 155 | 0.463 | | |
| | Total | 75.498 | 161 | | | |
| Faculty compensation and time | Between Groups | 3.641 | 6 | 0.607 | 0.948 | 0.462 |
| | Within Group | 99.187 | 155 | 0.640 | | |
| | Total | 102.827 | 161 | | | |
| Threat of technology | Between Groups | 15.936 | 6 | 2.656 | 2.679 | 0.017* |
| | Within Group | 153.689 | 155 | 0.992 | | |
| | Total | 169.625 | 161 | | | |
| Legal issues | Between Groups | 3.712 | 6 | 0.619 | 1.067 | 0.385 |
| | Within Group | 89.849 | 155 | 0.580 | | |
| | Total | 93.561 | 161 | | | |
| Evaluation effectives | Between Groups | 3.626 | 6 | 0.604 | 1.162 | 0.329 |
| | Within Group | 80.610 | 155 | 0.520 | | |
| | Total | 84.236 | 161 | | | |
| Assess | Between Groups | 6.284 | 6 | 1.047 | 1.637 | 0.140 |
| | Within Group | 99.161 | 155 | 0.640 | | |
| | Total | 105.444 | 161 | | | |
| Student-support services | Between Groups | 5.699 | 6 | 0.950 | 1.932 | 0.079 |
| | Within Group | 76.198 | 155 | 0.492 | | |
| | Total | 81.897 | 161 | | | |

The independent sample t-test in **Table 8** show the barriers perceived by teachers regarding the use of distance education technologies that were no significantly differed between online teaching training

**Table 8** Paired sample t-test of the barriers perceived by teacher regarding the use of distance education technologies between online teaching training.

| The barriers to distance education technology | Online teaching experience | | t | *p* |
|---|---|---|---|---|
| | Yes | No | | |
| Administrative structure | 3.60 | 3.42 | 1.203 | 0.231 |
| Organizational change | 3.68 | 3.45 | 1.405 | 0.162 |
| Technical expertise, support, and infrastructure | 3.65 | 3.54 | 0.650 | 0.516 |
| Social interaction and program quality | 3.76 | 3.66 | 0.731 | 0.466 |
| Faculty compensation and time | 3.88 | 3.62 | 1.569 | 0.119 |
| Threat of technology | 3.19 | 3.19 | −0.011 | 0.991 |
| Legal issues | 3.79 | 3.59 | 1.238 | 0.217 |
| Evaluation effectives | 3.89 | 3.60 | 1.909 | 0.058 |
| Assess | 3.69 | 3.44 | 1.455 | 0.148 |
| Student - support services | 3.91 | 3.72 | 1.304 | 0.194 |

**$p < 0.01$, *$p < 0.05$

## Conclusions and discussion

Compared with traditional classroom education, modern distance education dissemination activities both in terms of teaching objects, teaching means, teaching content, teaching methods and teaching subjects showed significant difference, the uniqueness of these in the network to carry out education activities, from one hand is to adapt to modern social education activities the product of the development of industrialization and information, On the other hand, it shows that the network distance education activities contribute to the development of personalized learning, and contribute to a greater extent of the impact of the effect of education and expand the scope of education objects. Modern distance education is mainly based on the new communication technology, computer technology and contemporary multimedia technology, and more effectively combined with the information technology of the new era and contemporary educational ideas. It has the following information transmission characteristics;

### Coexistence of autonomy and individuality

It is clear that the unique characteristics of traditional school education have been broken through by modern distance education, fully showing the flexibility and independent personality characteristics of modern distance education. On the one hand, based on the application of modern related communication equipment, modern distance education provides students who participate in educational activities with educational content and teaching methods to meet the special needs of different individuals. Compared with traditional education, the students in modern distance education has emerged as the core of education activity, can combine their own actual demand and the point of interest in the rich media resources and database to find suitable for their own learning content and data, and be able to active screening of vast amounts of information are combined, so as to extract the most suitable for their own learning related content; on the other hand, different learners can make corresponding arrangements for their own learning progress and plans based on their actual learning interests and needs, so as to complete and perfect the formulation of relevant learning objectives, and freely choose places and times suitable for their learning activities. In this way, their initiative will be maximized, while helping to improve the knowledge and skill structure to promote their own improvement and development.

With the rapid development of modern science and technology, modern distance education has made a breakthrough. After the 1990s, modern distance education increasingly shows the superiority of integrating a variety of new media technologies to develop education, such as the use of satellite,

interactive video, computer network, E-mail, voice answering machine and even the latest VR technology, and smoothly realize the real-time or non-real-time interactive teaching activities between teachers and students. This interactive educational activity is a kind of "dialogue" and "exchange" built on the new means of communication technology. This kind of communication between the output of information and the recipient greatly reduces the gap between face-to-face communication and learning between teachers and students in traditional education, and maximizes the efficiency and quality of teaching. At the same time, this feature also breaks through the limitations of traditional education, making it possible for "multiple excellent teachers to teach the same subject online at the same time", enriching the choices of learners. The communication between "one to one", "one to many", "many to one" and "many to many" can be realized at the same time, so that learners can obtain more sufficient and comprehensive knowledge information.

**Openness in time and space**

The physical and social and cultural barriers between teachers and students in traditional teaching have been broken down by the unique openness of modern distance education. The closed space between students and teachers has been broken in both time and space. However, after thinking and analyzing the characteristics of modern distance education at a deeper level, it is not difficult to find that the infinity of modern distance education is more reflected in the dissemination of "the latest knowledge and technological development". Now distance education compared with the traditional curriculum education which is relatively lagging behind development can be the first time on the basis of the use of communication technology means "the latest scientific research and cultural achievements" to the learner groups and even the whole human dissemination; at the same time, it can spread the latest achievements and findings of its scientific research to college students anytime and anywhere without time and space restrictions, and also communicate with the industry, which is conducive to the improvement of the level and efficiency of modern distance education to a great extent.

**Both controllability and dependence on teaching hardware and software resources**

Firstly, compared with traditional education, the controllability of network education is mainly reflected in the control of media resources, the management of teaching equipment and the use of teaching technology. Although there is often a large space distance between the education department and the educates in the distance education process, which undoubtedly makes the management of education managers more difficult to some extent, but combined with the current stage of network technology, The above contents can be effectively managed and controlled in network teaching activities management, degree awarding, course setting, teaching evaluation and activities, teaching plan arrangement, student registration and other aspects.

Meanwhile, in many cases, modern technology can also be used to carry out management activities, which often has a certain timeliness and scientific compared with traditional school management and teaching. However, on the other hand, it is not difficult to see that network education is more dependent on educational technology and equipment as well as educational management and human resources than traditional education. At present, distance education mainly relies on the internet and is supplemented by satellite classroom and CD and other forms of teaching activities, which determines that the implementation of network education first needs a large number of high-tech equipment investment, as a prerequisite for the successful implementation of distance education. This kind of higher requirement in technology and fund has virtually become one of the main obstacles to the development of modern distance education.

Meanwhile, in modern distance education, the dependence on education and management personnel, technical personnel are stronger, higher requirements. Network education environment education ideas and ways are some new changes, the teacher should have in addition to the traditional education in the network education environment activities of teachers' basic skills of professional knowledge, more should have the information consciousness and ability, to understand the characteristics of network education and ideas, and have the ability to create network education activities, in order to better provide services

for students, at the same time, the development of modern distance education also needs a large number of information technology personnel, the realization of network teaching resources and media equipment maintenance and management and development, which have put forward a great test to the development of modern distance education in the new era.

The whole world is gradually shrinking on the basis of the rapid development of the internet, and has become a comprehensive Unicom network. The connection between students and teachers is no longer limited by time and place, so the world has gradually become a real "global village". As the means of information exchange is relatively backward in traditional educational activities, it leads to the phenomenon of relatively closed and segmented educational information resources, and there are certain limitations in the information resources that can be shared between countries, regions and even between different schools. Therefore, under the influence of this factor, only a few people can enjoy and make use of excellent teacher resources and advanced theoretical achievements, so the development of modern education has been delayed, and the development of education globalization and the popularization of higher education has also caused certain limitations. The development of modern distance education breaks the limitation of this educational development, making every educational body can set up corresponding educational resources and information data on the network, so that every learner connected with the Internet can call these educational resources.

Meanwhile, related databases and libraries and other platforms can be built based on the network. Both the subjects of education and learners can share their learning achievements with each other, which is undoubtedly more significant compared with traditional education. The regional limitations in school education are effectively broken in the sharing of resources in network education activities, and the flow of resources across departments, regions and even countries is truly realized, which is obviously helpful to further promote the healthy development of modern distance education in China.

**Summary of obstacles in distance education**

Before discussing the specific obstacles to distance learning activities, we should also have a clear understanding of the physical limitations of distance learning activities. Based on computer, network and modern communication technology of distance learning for its rapid, economic, efficient and personalized characteristic won the majority of adult learners like of it, but everything is opposite and unified, in showing the advantages of distance learning at the same time, in fact also brought some conflicts with advantage of the weak, mainly manifested in the following aspects;

1) Students' autonomous learning is mainly based on receptive learning. Although computer, network and communication technologies have reached a highly developed level, the modernization level applied to distance learning has not reached the high level of technology for the sake of educational benefits. According to the investigation of many educational websites which are developing distance learning for teachers, the teaching method is relatively single. The more commonly used teaching methods are mostly non-real-time, mainly presenting pre-designed course text courseware, and if conditions are available, pre-recorded videos can be matched. Learners mainly conduct browsing receptive learning. While there are opportunities to learn online in real time, the learning time is relatively small. Some hands-on or situational courses require a high level of virtual design, so there are relatively few or no such courses in distance learning.

2) Flexible personalized learning is characterized by the separation of teaching and learning. Because of the use of long-distance transmission of information resources, so in time and space, teachers and students to learn objectively separated. Even with real-time online learning, teachers' teaching and students' learning are separated in space. Whether using CD or network, although learners can at any time to learn or repeatedly to the same learning content, but the interaction between teaching and learning cannot be in a timely manner or lag, the teacher can't get the learner's feedback information in a timely manner, learners can't timely get the teacher's help, or due to the delay characteristics to reduce the enthusiasm of both sides, it greatly reduces the generative information in the process of teaching and learning. From the perspective of teachers and students, there is a certain loss.

3) The separation of teaching and learning results in the separation of teachers and students, and students are more likely to see the monotonous images in the videos or the characters in the first version of teaching in Taiwan. Party caused by the teachers and students can't learn the content of communication in time, the other is missing on the traditional classroom teaching between teachers and students and common in thinking collision sparks of, on the other hand, with the traditional classroom teaching of teachers and students face exchange of contrast, the 2 sides of emotional communication and support weakened by the teacher's personality charm to the learner's smoked The pottery is almost gone.

4) Economic information transfer technology cannot perfect the transmission of teaching information. Not to mention the most advanced information transfer technology cannot transfer the generative resources in classroom teaching, even some preset information resources sometimes cannot achieve perfect transmission effect. On the one hand is the cost for technical considerations, such as the previously mentioned some operation, experiment class curriculum design, the cost is very expensive, which is not desirable economic on the other hand, influenced by the factors such as technology, the network bandwidth, transmission effect is sometimes not as good as expected, such as virtual activity room, online lectures due to reasons such as speed or personnel crowded interruptions. These to some extent affect the interest of learners in learning.

In addition to the inherent disadvantages mentioned above, the following factors play a particularly significant role in the obstacles to distance learning;

1) Problems and causes of course resources; the total amount of course resources are insufficient. Teachers network training curriculum is lagging, curriculum resources cannot meet the needs of learning, and more on basic theory, lack can directly guide the course of classroom teaching operational stronger course, such as the combination of teaching research courses, at the same time, the lack of a nationwide demonstration of excellent series of distance learning materials, and teachers in our country distance learning courses and teaching materials It is designed and developed by various colleges and universities or training institutions. In fact, it forms a local array and lacks mutual reference and exchange. Some excellent educational resources are not disseminated and utilized. However, some areas are distressed by the lack of excellent educational resources, resulting in the waste of educational resources and the imbalance of educational resources between regions.

2) It is difficult to develop high-quality curriculum resources because the distance learning curriculum resources are derived directly from the text resources. This kind of simple text representation is often the simple reappearance of book knowledge, the outline type reappearance of exams, and even books can't reflect the distance learning of learners' guidance functions and interactive features. Text, video, and audio resources are often separated. The forms of curriculum resources are not rich and are reduced. The availability of course resources as excellent curriculum resources is the integration of information and technology, and the subject of the integration of curriculum and information technology is the common direction of distance teaching workers to develop curriculum resources that not only provide a curriculum learning environment, but also lively and profound.

3) Curriculum resources should be further expansion of the openness of the distance learning is not only refers to the openness of the learning environment, also refers to the openness of the learning resources, which can provide learners with enough learning materials, including learning, auxiliary materials, such as electronic books, journals, including access to information and the preliminary study meet the learners to independently complete the research learning needs and individual differences of learners can help and guide learning. Meanwhile, but from the current situation of information links on the learning websites of primary and secondary school teachers in China, this aspect is far from enough.

## Recommendations

It is necessary to change teaching concept, cultivate inquiry-based talents and promote students' deep learning. Online teaching with open learning environment, increase the chance of interaction between students and teachers, and promote resource sharing and the knowledge sharing has great advantages, to a certain extent, is a change in the way of traditional teaching and learning, however, to take advantage of these, the biggest challenge is to not suitable for online teaching some of the traditional concept of

teaching and learning reform. Online teaching should not copy the traditional teaching mode based on knowledge transfer, but should find the right orientation, give play to its own advantages, and gradually change from knowledge transfer mode to constructivism mode. The curriculum should be more practical so that students can apply what they have learned. In the process of online teaching, we pay attention to the cultivation of students' application ability, emphasize the online interaction between teachers and students, so that students can discover real problems, deeply understand knowledge, critically think and analyze through discussion and communication, so as to achieve the purpose of in-depth learning.

Enhance students' own network learning ability. To improve the enthusiasm of interactive learning, learners themselves are the main body of learning. To improve the learning effect of online students, we must first start from the students themselves and enhance the role of internal factors. In the research, we also found that the objective factors and subjective factors of students affect the interaction behavior and interaction effect of students. Therefore, according to the specific problems of students, we put forward 5 teaching strategies to enhance their learning initiative as follows: Strengthen network training guidance, improve the students' understanding of network training learning in the beginning of network training, first of all, to make the network training a student in the thought of this training have a certain understanding, that is, on the attitude of training to pay attention to, can learn in the future seriously study. First, teachers should be trained to understand the necessity of lifelong education, the urgency of not learning or falling behind, and not using the Internet or anything else.

Open education and lifelong education has become a world trend, one of the reasons is that it makes people made clear such an understanding, namely the problem of education is not only the problem of education itself, but also a social problem, relationship to reconstruct knowledge of production and distribution system, the formation of the social relations of equality, harmony. Therefore, the current education on the one hand to serve the knowledge society, on the other hand to prepare everyone for lifelong development. The information and communication technology represented by internet technology has timely confirmed and strengthened this understanding. Over the past few decades, we have experienced an assessment that has made people around the world realize that not only are educational opportunities now available to learners of all ages. Moreover, learners themselves can also edit and publish learning resources and become active participants from passive recipients of network resources. With the help of social software, learners can also interact with more people and share their learning experiences. This breaks the monopoly of a few people on knowledge in the past, and promotes the democratization and diversification of knowledge production and distribution. Teachers are no longer the only source of information, the teacher-student relationship changes, and teachers' knowledge authority is challenged, which results in the shift of teaching focus from teacher-centered to student-centered. At the same time, the extension of learning is increasing, with a focus on and recognition of informal learning, prior knowledge and experience acquired outside the formal classroom, as well as learning, training and certification in the workplace. Therefore, higher education institutions and educators have to consider how to change the original management model, curriculum system, teaching model and evaluation model to meet the needs of learners.

Teachers should be recognized in the development of network courses, especially in the late innovation of the important position. However, the development of subjects and courses should be consistent and progressive, and there should be a group or a team to carry out curriculum innovation, not just limited to a single teacher. Because of the soldiers of the iron camp, the teachers of the network college are mobile. Just like traditional classrooms, classic textbooks can be revised over time and passed down from generation to generation. It is not feasible to say that only the original design and development personnel can control the transformation of the curriculum. From the perspective of the domestic situation, in the process of hiring network teachers, generally schools will sign intellectual property protection contracts with the hired network teachers. The contract is clear: The school owns the intellectual property rights of the online courses, and the online teachers have the right of authorship. But the network courseware can only be used within the scope of the school, not sold or transferred, otherwise, teachers have the right to investigate responsibility or claim compensation. Network teachers shall not sell or transfer network software to a third party, or compensate for all losses. From the

organization mode of online courses, it can be seen that online courses mainly involve the following copyright subjects: The organizers of course development (network school), the developers of online courses, the authors of original works, and the users of courses (students). In order to realize the use of online courses for educational purposes, it must be made in a unified style and as a whole by the organizers of course development. Therefore, we believe that the organizer of course development should have the right to modify and use the online course submitted by the course developer, and also enjoy the copyright of the edited online course. However, when exercising the copyright, the copyright of the original online course should not be infringed, especially the right of authorship of the original course developer.

## References

Ai, D., & Zuo, H. (2011). Discussion on college teachers' understanding of barriers to online education. *Value Engineering, 23*, 211.

Baran, E., Correia, A., & Thompson, A. (2011). Transforming online teaching practice: Critical analysis of the literature on the roles and competencies of online teachers. *Distance Education, 32*(3), 421-439.

Bates, A. W. T. (2005). *Technology, e-learning and distance education.* (2nd ed.). Oxfordshire, England: Routledge.

Berge, Z. L. (1998). Barriers to online teaching in post-secondary institutions: Can policy changes fix it? *Online Journal of Distance Learning Administration, 1*(2), 1-13.

Berge, Z. L., & Mrozowski, S. E. (1999). Barriers to online teaching in elementary, secondary, and teacher education. *Canadian Journal of Educational Communication, 27*(2), 59-72.

Brindley, J. E., Walti, C., & Blaschke, L. M. (2009). Creating effective collaborative learning groups in an online environment. *International Review of Research in Open and Distance Learning, 10*(3), 1-18.

Bullock, D. W., LaBella, V. P., Clingan, T., Ding, Z., Stewart, G., & Thibado, P. M. (2002). Enhancing the student-instructor interaction frequency. *The Physics Teacher, 40*(9), 535-541.

Dickey, M. D. (2016). Barriers and enablers in integrating cognitive apprenticeship methods in a web-based educational technology course for K-12 (primary and secondary) teacher education. *ALT-J, 15*(2), 119-130.

Du, Y., & Xu, F. (2006). Research on the factors hindering the development of online education by university teachers. *China Audio Visual Education, 11*, 31-33.

Feng, A., & Cheng, M. (2020). Exploration of adult academic education reform under the background of information technology: Taking the education and teaching reform of Taiyuan University of Technology as an example. *Educational Theory and Practice, 36*, 23-25.

Higher Education Program and Policy Council of the American Federation Teachers. (2000). *Guidelines for good practice.* Higher Education Program and Policy Council of the American Federation Teachers.

Huang, G. (2009). Analysis of factors hindering the implementation of online education in my country and countermeasures. *Journal of Chongqing Electronic Engineering Vocational College, 5*, 115-117.

Jiandong, C. & Chunyu, D. (2014). Analysis of obstacles to online teaching in colleges and universities and research on solutions. *Open Education Research, 5*, 45-51.

Keengwe, J. (2015). *Handbook of research on educational technology integration and active learning*. Pennsylvania, United States: IGI Global.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and psychological measurement. *Educational and Psychological Measurement, 30*, 607-610.

Kwan, R., Fong, J., Kwok, L., & Lam, J. (2011). *Hybrid learning.* In Proceedings of the 4th International Conference ICHL 2011, Hong Kong, China.

Li, Y., & Lindner, J. R. (2005). University teachers' understanding of obstacles in the development of online education: A questionnaire survey report from the teacher group of China Agricultural University. *Open Education Research, 6*, 87-90.

Liu, R., Sun, T., & Liu, G. (2017). *The research on the development trend of "Internet +" continuing education.* In Proceedings of the 2017 International Conference of Educational Innovation through Technology, Osaka, Japan.

Lobina, D. J. (2017). *Putting it all together.* Oxford Scholarship Online.

Martin, F., Parker, M., & Allred, B. (2013). A case study on the adoption and use of synchronous virtual classrooms. *Electronic Journal of e-Learning, 11*(2), 124-138.

Martin, J. J. (2017). *Social barriers.* Oxford Scholarship Online.

Miller, D. R. (2018). Online teaching at its best: Merging instructional design with teaching and learning research. *Journal of Public Affairs Education, 24*(4), 557-560.

Nelson, S. J., & Thompson, G. W. (2005). Barriers perceives by administrators and faculty regarding the use of distance education technologies in perspective programs for secondary agricultural education teacher. *Jurnal of Agriculture Education 46*(4), 36-48.

Orodho, J. (2009). *Elements of education and social science research* (3rd eds.). Kazezia Publishers, Nairobi.

Roblye, M. D., & Ekhaml, L. (2000). How interactive are your distance courses? A Rubric for Assessing Interaction in Distance Learning. *Online Journal of Distance Learning Administration, 3*(2), 7.

Roblyer, M. D., & Wiencke, W. R. (2003). Design and use of a rubric to assess and encourage interactive qualities in distance education. *The American Journal of Distance Education, 17*(2), 77-98.

Rogers, E. M. (1995). *Diffusion of innovations.* New York: The Free press.

Safford, K., & Stinton, J. (2014). Barriers to blended digital distance vocational learning for non-traditional students. *British Journal of Educational Technology, 47*(1), 135-150.

Schramm, W. (1955). *How communication works.* In Schramm, W. (Ed.). The process and effects of mass communication. Illinois, United States: University of Illinois Press.

Song, F., Su, L., Li, Y., & Fang, Y. (2004). Analysis of teacher resistance factors in university network teaching. *Jiangsu Higher Education, 4*, 58-60.

Sophonhiranrak, S. (2021). Features, barriers, and influencing factors of mobile learning in higher education: A systematic review. *Heliyon, 7*(4), e06696.

Stevenson, C., & Bauer, J. (2019). *Enriching collaboration and communication in online learning communities.* Pennsylvania, United States: IGI Global.

Tang Shumin. (2020). *Research on the teaching reform of adult higher education in the "Internet +" era* (Master's Thesis). China: Xiangtan University.

Wang, Y., Peng, H., Huang, R., Hou, Y., & Wang, J. (2008). Characteristics of distance learners: Research on relationships of learning motivation, learning strategy, self-efficacy, attribution and learning results. *Open Learning: The Journal of Open, Distance and e-Learning, 23*(1), 17-28.

Wei H. (2005). A review of foreign research on the motivation and obstacles of university teachers participating in distance education. *Journal of Guangdong Radio and Television University, 3*, 99-102.

Welman, J. C., & Kruger, S. J. (1999). *Research methodology for the business and administrative sciences*. Johannesburg, South Africa: International Thompson.

Xiao, J. (2020). *On the margins or at the center? Distance education in higher education*. (pp. 158-173). In Mays, T. J., Aluko, F. R., & Combrinck M. H. A. (Eds.). Exploring Dual and Mixed Mode Provision of Distance Education. Oxfordshire, England: Routledge.

Xu, H. (2018). Analysis of the status quo of college teachers engaged in online teaching. *Guangdong Sericulture, 10*, 97-99.

Yan, Y. (2020). *Research status of big data and education Informatization in China - study based on Biliometric and content analysis (2010 - 2019)*. In Proceedings of the 2020 International Conference on Big Data and Informatization Education, Zhangjiajie, China.

Zhu, R. (2017). On college teachers' understanding of barriers to online education. *Intelligence, 12*, 24.