



Research on training Strategy of information Technology Application Ability of Normal university students

Shi-mei JIN¹, Liu-wen DING¹, Ding-rui LIU² and Hui-yan LI³

¹Department of Computer Science, Yanbian University, Yanji, 133000, China

²Department of Computer Science, Northeast Normal University, Changchun, 130000, China

³Dept.of Japanese, Yanbian University, Yanji, 133000, China

Abstract

Background/Objectives: Under the background of educational informatization, the realization of education modernization and information education is the inevitable trend of future education development. As the backbone of the future teacher team, the level of information technology application ability of normal university students is the key to the modernization of future education. Therefore, the ministry of education proposed to strengthen the cultivation of information literacy of normal university students. **Methods/Statistical analysis:** As the cradle of basic education teachers in yanbian prefecture, yanbian university should strengthen the cultivation of information technology application ability of normal university students and study the current situation of the cultivation. In this paper, two questionnaires were conducted before and after the training of normal university students in yanbian university. **Findings:** Through the comparison and analysis of the two data by SPSS software, it is found that there is no specific training for normal university students in the training of information technology application ability of normal university students in yanbian university. Teaching less theoretical knowledge; Students have fewer opportunities to practice the problem. **Improvements/Applications:** Finally, the author puts forward some strategies for the future cultivation of information technology application ability of normal university students in yanbian university. For the training of excellent information teachers to contribute.

Index Terms

Normal students, Information technology application ability, Information teaching, Training strategy, Teaching

Corresponding author : Shi-mei JIN

kimsm@ybu.edu.cn

- Manuscript received November 10, 2020.
- Revised December 14, 2020 ; Accepted December 20, 2020.
- Date of publication December 31, 2020.

© The Academic Society of Convergence Science Inc.

2619-8150 © 2019 IJASC. Personal use is permitted, but republication/redistribution requires IJASC permission.

I. INTRODUCTION

In April 2018, the Ministry of Education issued the "Education Informatization 2.0 Action Plan". The Ministry of Education puts forward the development goal of strengthening the cultivation of information literacy and informationization teaching ability of normal university students.

In the new era, the requirements for teachers' application ability of information technology are gradually improving. Yanbian University should make more efforts to cultivate the application ability of information technology of normal university students. Therefore, it is necessary for us to study the current situation of information technology application ability cultivation of normal university students in order to find better cultivation methods.

II. DEFINITION OF RELEVANT CONCEPTS

A. Normal university students

The so-called normal university students refer to the students whose majors belong to the direction of education and whose future employment goals are relatively clear, that is, they are the preparers for future teachers who are engaged in teaching management in schools or educational institutions at all levels.

The normal students in this paper refer to the students studying in the normal major of Yanbian University who will be engaged in education-related work in the future.

B. Application ability of information technology

The application ability of information technology refers to the ability to obtain, transmit, store, process, display and distribute information by using electronic computer equipment and modern communication means.

The application ability of information technology in this paper means that teachers can make use of modern information technology to assist teaching. The ability to optimize teaching, change the traditional learning mode, change the existing teaching structure, and fully realize the informationization of education.

C. Information technology application ability of normal university students

Normal university students are both learners and future educators. Therefore, the application ability of information technology of normal university students not only includes the above optimization and teaching assistance ability, but also includes the

ability of normal university students to apply information technology in their own learning. That is, normal university students can use technology to improve their learning ability.

III. THEORETICAL BASIS

A. Information Technology Application Ability Standard for Primary and Secondary School Teachers

Competence standards are the basic and developmental requirements for the information education, teaching and professional development of primary and secondary school teachers in China in 2014 according to the actual situation of information technology in primary and secondary schools in different regions of China. This standard will be the primary and secondary school teachers should achieve the level of application from two aspects, five dimensions to elaborate. A total of 25 standards were formulated.

As the reserve army of future teachers, normal university students should take the state's in-service teachers in primary and secondary schools as the benchmark and learning direction. Colleges and universities should also refer to the "ability standard" for the training of normal university students' application ability, and train normal university students towards developmental requirements on the basis of basic requirements.

B. TPACK Theory

In 1986, Lee Shulman, an American educational psychologist, proposed the teacher education curriculum and divided it into several categories, one of which is subject education knowledge, referred to as PCK[17]. In 2005, well-known American scholars Koehler and Mishra introduced technology into THE PCK and proposed the subject teaching knowledge of integrated technology, which was named AS TPCK. It was renamed TPACK in 2007 and has been better understood. In the name, T is for technology, P is for teaching method, A is for And, C is for subject And K is for knowledge. TPACK can be divided into seven types of knowledge learning.

Teachers should not only master technical knowledge, subject knowledge and teaching method knowledge, but also master to integrate technology deeply into subject teaching knowledge. The so-called integration does not mean the superposition of three kinds of knowledge, but the deep integration of three kinds of knowledge.

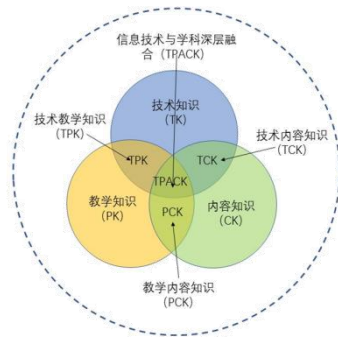


Fig. 1. TPACK Model

TPACK is an essential knowledge that teachers should have. As future educators, normal university students should also master the method of applying the information technology they have learned to the teaching of the subject, which is a part of the application ability of the information technology of normal university students. In order to cultivate the application ability of information technology of normal university students, colleges and universities should fully combine the teaching characteristics of each subject to carry out targeted training.

C. Transfer theory of learning

Learning transfer refers to the influence of one kind of learning on another kind of learning, or the influence of acquired experience on the completion of other activities. The famous German psychologist Cohler believed that people should be good at discovering the connections between things if they want to promote and transfer their acquired things.

The dual identity of normal university students can make full use of the theory of learning transfer to transfer the training of information technology application ability received by normal university students to the future information teaching in education and teaching. Here, the training of information technology application ability accepted by normal university students refers to the acquired experience, and the future information teaching activities refer to other activities in the definition. It can be understood as a transfer from learning experience to teaching activities.

IV. DATA COLLECTION AND ANALYSIS

A. Design of research tools

The purpose of this study is to investigate the current situation of information technology application ability training of normal university students in Yanbian University. This questionnaire refers to the self-assessment Tool for Information Technology Application Ability of Normal University Students developed by experts from six famous normal universities [12]. The questionnaire

will be released through the questionnaire star platform.

In order to ensure the reliability and authenticity of the questionnaire results, two classes of yanbian University taking modern Educational Technology were selected for investigation. He also majors in liberal arts and science. The respondents are all normal university students who want to be engaged in education-related professions in the future.

The purpose of this questionnaire survey is to understand the current situation of training it application ability of normal university students in Yanbian University. The questionnaire was set up with 60 single-choice questions. It is divided into three large dimensions, each of which contains three aspects, and a total of nine dimensions are used to evaluate the application ability of information technology of normal university students.

The first is the dimension of basic technical literacy. A total of 17 questions are set for this dimension, which is divided into three aspects: 5 questions about awareness and attitude, 9 questions about technical environment and 3 questions about information responsibility. Secondly, the dimension of technical support learning was set, with a total of 17 questions, among which 6 questions were set for autonomous learning ability, 4 questions for communication and collaboration ability, and 7 questions for research and innovation ability. Finally, there is the teaching dimension of technical support, in which 8 questions are set for resource preparation ability, 12 questions for process design, and 6 questions for practice reserve, with a total of 26 questions.

The investigation is divided into two phases. At the beginning of the semester, the questionnaire was handed out to the respondents and collected. After a period of training for normal university students, the questionnaire will be issued to the respondents again at the end of the semester and the data will be recovered for the second time. Two questionnaires were issued, 130 questionnaires were respectively issued, 125 were recovered, and the effective recovery rate reached 96.1% with 125 valid questionnaires. It's representative, it can be reversed

B. Reliability and validity test of the questionnaire

a. Reliability test

The coefficient test method was used to test the reliability of the questionnaire. The value was 0.972 greater than 0.9, which was an ideal state. The questionnaires have high reliability.

b. Validity test

This questionnaire is derived from a self-assessment tool for information technology application ability of normal university students developed by a team composed of more than 20 experts specializing in educational technology from

six famous normal universities in China [4], and this self-assessment tool has gone through several rounds of tests. Therefore, the validity of this questionnaire is relatively high.

C. Paired sample T test of pre-test and post-test

In order to enhance the accuracy of data in this study, paired sample T-test was conducted for the two studies before and after testing, and whether there was a significant difference between the two test results was analyzed. As shown in Table 2-1.

Through the analysis of the results, it can be seen that the P value is $0.00 < 0.05$ in the 8 dimensions of consciousness and attitude, technical environment, independent learning, communication and collaboration, research innovation, resource preparation, process design and practice reserve. Therefore, there is a significant difference between the pre-test results and the post-test results in the above 8 dimensions. The ability of normal university students has been improved after the training, which is better than the ability before the training.

However, in the dimension of information responsibility, $p=0.82 > 0.05$, so there was no significant difference between the pre-test and post-test results of this dimension. The reason why there is no significant difference in the data measured before and after the dimension of information responsibility is analyzed. The average value of the information responsibility dimension in the pre-test reached 4.15 (5 being the highest value), thus it can be seen that the former normal university students generally have the information responsibility.

D. Dimension of consciousness attitude

In the distribution of the five questions in the questionnaire is for students to use information technology consciousness attitude survey, sorts through the data found that 6.50% of the students before training is very like to learn new applications, 32.52% of the students prefer to have 18.70% of the students don't like it, a neutral attitude of students reached 42.28%, accounted for nearly half.

From the above data, it can be seen that students have little interest in information technology before training. Nearly half of the students have no sense of information technology, and nearly half of the students do not study on the open platform, access to learning resources.

But after a period of cultivation, when the second survey data were analyzed, the data changed significantly.

After one semester's cultivation, it can be found that more than half of the students begin to accept and like the new application of information technology, and the number of students who like it has increased significantly. There has also been a significant drop in the number of students disliked,

from 23 to as low as six. The number of average, neutral students has declined.

E. Information responsibility dimension

Having a good awareness of information security is the first step to become an information teacher. Before the training, most students chose "very consistent" and "relatively consistent" on the question of "I have information security awareness", but a small number of students still held neutral and inconsistent attitudes. But after a semester of training found that normal university students information security awareness has been improved. Most of the students chose to conform, the proportion of which was as high as 90.25%, and only less than 10% of the students' information security awareness has yet to be improved.

F. Technical environment dimension

The so-called technical environment dimension refers to the degree of mastering the basic skills of information technology of normal university students. Normal university students can independently skillfully use and operate various multimedia hardware and software, and have the ability to make teaching resources with such software. This study investigates the level of students' mastery of different types of skills. The data collected from the two surveys are shown in Table 1 below.

Table 1. TABLE OF ATTITUDES BEFORE AND AFTER TRAINING OF VARIOUS BASIC SKILLS

		Very much agree (%)	Quite agree (%)	Average (%)	Not so much agree (%)	Not so much agree (%)
Multimedia teaching equipment	pretest	2.44	18.70	47.97	25.20	5.69
	posttest	11.38	39.02	39.02	10.57	0.00
The image processing	pretest	4.07	17.07	38.21	31.71	8.94
	posttest	14.63	46.34	31.71	7.32	0.00
Video audio processing	pretest	6.50	20.33	26.83	35.77	10.57
	posttest	15.45	43.09	31.71	8.94	12.20
Network storage	pretest	27.64	35.77	30.08	3.25	3.25
	posttest	33.33	44.72	19.51	2.44	0.00
Online learning platform	pretest	16.26	36.59	36.59	7.32	3.25
	posttest	27.64	47.97	21.14	3.25	0.00

The so-called technical environment dimension refers to the degree of mastering the basic skills of information technology of normal university students. Normal university students can independently skillfully use and operate various multimedia hardware and software, and have the ability to make teaching resources with such software. This study investigates the level of students' mastery of different types of skills. The data collected from the two surveys are shown in Table 2-3 below

As can be seen from the above table, students' mastery of various hardware and software is not very high before training, especially their mastery of

multimedia teaching equipment and picture processing software shows obvious deficiencies. In addition to more than half (62.41%) of those who meet the requirements of network storage software mastery, the others are less than half.

After the training, normal university students have obviously improved their mastery of basic skills of information technology. But improving for different types of skills also makes a big difference in Chengdu. The number of normal university students who chose "very consistent" or "relatively consistent" increased by 39.83%. However, in terms of the use of video and audio processing software, the number of normal university students who chose "normal" or "not very consistent" or "not very consistent" was still more than half, reaching 52.85%, despite the improvement of their mastery of the software. In terms of multimedia devices, the growth rate of choosing "conforming" reached 29.96 percent, but nearly half of normal university students (49.59 percent) chose "not conforming" or "not conforming".

G. Dimensions of autonomous learning

Whether normal university students have the ability to use information technology to support their learning is also an important criterion to judge whether normal university students have this ability.

Before training, when investigating whether normal university students have the ability to use technology to plan their learning and record their learning process, 9.76% of normal university students choose "very consistent" and 25.20% choose "relatively consistent". 26.83% of normal university students chose "not very consistent", 2.44% chose "very inconsistent", and a small number of students remained neutral. It can be seen that most normal university students cannot use information technology tools to assist learning in the learning stage.

After the training, the number of normal university students who meet the requirements has reached nearly half, with an obvious growth rate of 28.45%. There has also been a significant decrease in the number of normal university students who do not meet the requirements and hold neutral attitudes. Compared with the 65.04% before training, the number has decreased to 36.59%, which is relatively consistent with the growth rate of the second dimension. The cultivation has achieved a certain effect.

In the question of whether normal university students will be distracted by other applications in autonomous learning, most of the students are neutral or "inconsistent" before training. It proves that whether students will be disturbed by other factors when they use information technology to study or not, and their learning ability is weak. After the training, it can be seen that although there is

some improvement under the learning focus of normal university students, the degree of improvement cannot be obvious. Normal University students will still be disturbed by other information or communication when they use information technology tools to study.

H. Communication and collaboration dimensions

In the daily learning of normal university students, the ability to communicate and interact with information technology is one of the aspects to test the ability of normal university students. This study investigates this aspect.

For normal university students can use information technology tools in mutual evaluation to improve the collaboration effect. Before the training, there were.% of the normal students "do not meet", and nearly half of the normal students "average". It can be seen that students may have heard of the use of information technology tools for mutual evaluation, but do not know the specific operation. After a period of teacher training, most students (68.04%) can use information technology tools for mutual evaluation. There has been a marked improvement in this area

I. Research innovation dimension

The most essential identity of normal university students is that they are undergraduate students. As college students, they should have the ability to study problems and make innovations. The use of information technology in the research and innovation phase makes research more convenient.

The analysis and processing of data in the subject research of normal university students plays an important role. In the normal use of the software for data analysis ability, training before a third of the students chose "very accord with" or "satisfied", half of the students chose the "general", they consciously to use data processing software of data processing and analysis, but there are not good at, a lot of function will not use. After the training, 65.04% of the normal university students chose to meet the requirements, with an obvious increase in the number of students, but there are still 30.08% of the normal university students chose "average".

An investigation was conducted on the question that normal university students can make original works with information technology according to specific needs. Before training, only 23.58% of normal university students "meet" and 36.59% of normal university students "do not meet". After training, the number of normal university students who meet the requirements of the title has increased significantly. But 31.71 percent of normal university students still chose "average".

J. Resource readiness dimension

Normal university students should have the ability to select or produce teaching resources that meet their own teaching needs. When investigating whether normal university students can follow certain standards to judge digital teaching resources. Before the training, 30% of the normal university students do not have this ability, 40% of the normal university students have this ability, and 30% of the students think they have this ability. It can be seen that the ability to train former normal university students in this aspect is deficient. After a semester of cultivation, the ability of normal university students to judge digital teaching resources has been significantly improved.

K. Process design dimension

Normal university students should have the ability to complete the design of information teaching process. It is necessary to understand the modes and evaluation methods of different kinds of information teaching resources. In the investigation of normal university students' understanding of the mode of informationized teaching, only a very small number (13.82%) of normal university students met the requirements before training, and more than half of them were "not very consistent" or "not very consistent". However, after the training, 40.65% of normal university students chose to meet the requirement, and the number of students who did not meet the requirement also decreased significantly.

L. Practice reserve dimension

In terms of whether normal university students can successfully implement the design scheme in real teaching environment, only 30.08% of normal university students choose "very consistent" or "relatively consistent" before training. Nearly half of them were able to implement the design in the real teaching situation, but the implementation did not go well. However, the number of those who chose "fit" after training increased significantly, reaching 58.54%. However, 37.40% of normal university students still choose average, and there are still problems in the implementation process

V. PROBLEMS IN CULTIVATION AND ANALYSIS OF THEIR CAUSES

A. Problems in cultivation

a. There is no targeted training for normal university students

By analyzing the research data of technology environment dimension, we can find that some students have mastered different types of skills. For example, 27.64% of the students are very familiar with the use of network storage software. But for the audio and video processing software is relatively

unfamiliar. If the teacher does not analyze the students' ability before training the normal students, it will lead to the problem that the students' learning needs cannot be trained.

Because the information technology application abilities of normal students are different before training, the ability distribution of students in the class will be uneven if they are divided into classes according to their majors. And the teacher did not investigate and analyze the students' existing ability before class, but treated the students as students of the same level for teaching, resulting in the situation that the students with relatively strong ability could not learn more difficult knowledge, the students with poor ability could not understand in class, could not keep up with the teaching progress, and learning was relatively difficult. The improvement of students' ability is not high.

b. There are few theoretical knowledge professors in the training

Through the analysis of the data from the two dimensions of technical environment and process design, it can be found that the normal students' motor skills have been significantly improved after a period of training. But the improvement of theoretical knowledge reserve is not obvious. As a result, the theoretical knowledge of normal students is still relatively scarce.

Skills and practice need the support of theoretical knowledge. Through the analysis, it is found that students' theoretical knowledge has not increased significantly, which proves that teachers ignore the teaching of theoretical knowledge in the process of training normal students' information technology application ability.

c. Students have fewer opportunities to practice

Through the analysis of the data of practice reserve dimension, students' practical ability has been improved after training, but there are still some problems. The application ability of information technology needs to be continuously exercised through the process of practice. But the class hours are limited, students do not have a lot of practice time in class. Few normal students practice independently after class. These reasons will result in less opportunities for students to practice, resulting in the ability of normal students can not be very good.

B. Analysis of the causes of the problem

a. The school attaches little importance to it

Yanbian University pays less attention to this aspect. Only one course of modern educational technology has been set up in this aspect. And the class hours of this course is only 32 hours, and the course of 2 hours per week can't impart all the application knowledge of information technology to normal students. Only for a certain software or hardware to explain.

And the school provides less hardware facilities for normal students. In addition to educational technology, there are few smart classrooms and micro classrooms for normal students of other majors to practice. Normal students' knowledge can not be fully practiced, which will also affect the improvement of normal students' information technology application level.

b.Lack of qualified teachers

The normal students of Yanbian University are distributed in various colleges, and the number of normal students is large. The normal students of every major in the whole school are required to take the course of "modern educational technology". The course is taught by teachers of educational technology in Normal College of Yanbian University, but the number of teachers is limited. There is a large demand for courses and a small number of teachers. Each teacher has to train students majoring in educational technology. Teachers' energy is limited, which may cause teachers not to pay attention to every normal student.

c.Uneven level of students' basic ability

Contemporary normal students grow up in the era of continuous development of information technology, so they have the ability more or less. However, because some students are under great learning pressure before they go to university and their parents are relatively strict, they have less time to contact information technology. Therefore, this kind of normal students' ability is lower than other students.

d.Students do not pay enough attention to it

Students themselves do not pay much attention to the courses of application ability of information technology. Normal university students do not understand educational informatization 2.0. Due to insufficient attention, students do not attend class. The end of the semester is a muddle. These behaviors greatly increase the difficulty of teacher training. Students themselves do not pay attention to the course of information technology application ability [10]. Teachers' business can't realize how their ability to master the application of information technology can help the future teaching. Normal students don't understand education informatization 2.0. Due to the lack of attention, students do not attend class. For the end of the term, it's also a matter of coping. These behaviors greatly increase the difficulty of teacher training.

VI. STRATEGIES FOR CULTIVATING NORMAL UNIVERSITY STUDENTS' INFORMATION TECHNOLOGY APPLICATION ABILITY IN THE FUTURE

A. Implement targeted class placement and hierarchical teaching

The training of information technology application ability of normal students in Yanbian University lacks the training of students' theoretical knowledge. In the later training process, it is suggested to teach students more theoretical knowledge. At the same time, it is suggested that teachers should give normal students more opportunities to practice. For example, when teaching students how to use multimedia teaching equipment, we should not just show them how to use it, but let them practice it by themselves. In the process of normal students' practice, there will certainly be some problems. Teachers should not directly tell students how to solve them, but guide students how to solve them. Only in this way can normal students solve the problems independently in the future. Theoretical knowledge is boring, teachers should constantly intersperse theoretical knowledge in practice teaching, so as to achieve the training mode of combining theory with practice.

B. Develop a training model that combines theory with practice

Limited by class hours, the content of offline classroom teaching is not enough. So teachers should be good at using all kinds of learning software to assist teaching. Teachers can upload resources in the resource database for normal students to learn. At the same time, part of the content can be made into micro class or network course for students to learn after class. The online + offline mixed teaching mode can not only expand the knowledge of normal students, but also make use of online communication and interaction with students, master the learning situation of normal students in time, and cultivate students better.

C. Adopt the online + offline mixed teaching mode

The experiential teaching can be integrated into the training process. For example, in teaching normal students how to use information technology to make micro lesson, teachers can play excellent micro Lesson Videos to normal students in class. For another example, when teachers teach normal students how to make online courses with Dreamweaver, they can also prepare the online courses for students. Let students first experience what convenience information technology brings to their study. Let them first accept and like the information technology assisted teaching, so that they can better learn, and apply their knowledge to the future classroom.

D. Experiential teaching integrated classroom training

The experiential teaching can be integrated into the training process. For example, in teaching normal students how to use information technology to make micro lesson, teachers can play excellent micro Lesson Videos to normal students in class. For another example, when teachers teach normal students how to make online courses with Dreamweaver, they can also prepare the online courses for students. Let students first experience what convenience information technology brings to their study. Let them first accept and like the information technology assisted teaching, so that they can better learn, and apply their knowledge to the future classroom.

VII. CONCLUSION

This study conducted two surveys on normal university students through questionnaire survey. This paper points out that there are some problems in the cultivation of Yanbian University, such as no targeted teaching, few theoretical knowledge professors and few practical opportunities for students. And the attribution analysis is carried out from three aspects of school, teacher and student. Finally, four future cultivation strategies are proposed.

Nowadays, information teaching is being promoted constantly, and the requirements for future teachers' information technology application ability are also being constantly updated. Therefore, the cultivation of normal university students' information technology application ability also needs constant research and updating. In order to train more in line with the characteristics of the era of information teachers.

REFERENCES

- [1] Ministry of Education. Notice of the Ministry of Education on printing and distributing "Education Informatization 2.0 Action Plan".[EB/OL] http://www.moe.gov.cn/srcsite/A16/s3342/201804/t20180425_334188.html.
- [2] Yan Hanbing, Li Xiaoying, Ren Youqun. (2018).Development and verification of information technology application ability self-assessment tool for normal university students, research on audio-visual education,39(01):98-106.
- [3] Ren Youqun, Yan Hanbing, Li Xiaoying. (2008). Interpretation of Standard of Information-based Teaching Ability for Normal University Students. Research on Audio-Visual Education, 39(10):5-14+40.
- [4] Zhou Dongdai, KUang Zhejun, YU Ying, Tang Yewei. (2017). Current Situation and Promotion Strategy of Information Technology Application Ability of Normal University Students based on new Standard. China Audio-Visual Education,(07):42-46+66.
- [5] Zhou Yang, (2017) Research on training of Normal University students' Application Ability of Information Technology from the perspective of TPACK. Hebei Normal University.
- [6] Tang Porcelain, Yang Xin, (2016). Practice and Thinking of information Technology Application Ability Cultivation for normal university students . China Education Informatization,(06),73-74+79.
- [7] Xiao Man, Zhou Rui. (2012). Application of digital learning resources in information technology application ability training of normal university students. Software guide (educational technology),11(06):78-80.
- [8] Jiang Hui, Hu Yujuan, Wu Di. (2017). Research on training of undergraduate normal university students' application ability of information technology in the era of big data. Software guide (educational technology),16(02):45-47.
- [9] Yang Minqi. (2019). Research on the Current Situation and Promotion Strategy of information Technology application ability of Normal University students. Qufu Normal University.
- [10] Gao Yuefei, Zhao Dan, Wu Zhongda. (2019). Enlightenment of teacher information Technology Application Ability Enhancement Training on training of Normal University Students. China Educational Technology and Equipment,(02):22-23+28.
- [11] Wang Xiaomeng. (2018). Research on training of Information Technology Application Ability of Normal University students to adapt to the "Internet +" environment. Zhejiang Normal University.
- [12] Wu Xuemei. (2017). Discussion on training Strategies for normal University Students' Educational Technology Application Ability. Modern Vocational Education,(22):149.
- [13] Miao Liping. (2017). Research on training strategies of information technology and curriculum integration ability of normal university students. Journal of heilongjiang institute of education,36(06):38-40.
- [14] Wang Meirong. (2017). Research on training Strategies of Information Technology Application Ability of Normal University students from the perspective of Maker Education. Shenyang Normal University.
- [15] Li Jianpeng. (2017). Application of digital learning resources in information technology application ability training of normal university students. Information recording materials,18(04):94-96.