[1]Suhua Jiang
[2]Lei Zuo
[3]Xueming Ma
[4]Wenzhong Wu
[5,*]Lin Li

Analysis of Intelligent Teaching Ability of Pre-service Biology Teachers Based on TPACK Theory

Journal of Electrical Systems

Abstract: - The level of Technological Pedagogical Content Knowledge (TPACK) of modern intelligent-based teaching directly affects the teaching ability of pre-service teachers. In this study, all the students majoring in biological sciences in the College of Life Sciences of X Normal University were selected as the research objects. The existing TPACK level of pre-service biological teachers was investigated by means of literature research and questionnaire survey, and the factors that might influence the TPACK level of pre-service biological teachers were analyzed. The results showed that the overall TPACK level of pre-service biology teachers was in the middle level, and the TK level was the lowest, followed by the TPCK level. The seniors were higher than the freshmen in all dimensions of TPACK, and there were significant differences in each dimension. Seniors were higher than juniors in all dimensions of TPACK, and there were significant differences between them in CK and TPK, while there were no significant differences in other dimensions. Comparing the juniors and seniors as a whole with the freshmen and sophomores students as a whole, it was found that the former was higher than the latter in seven dimensions, and the differences in each dimension were extremely significant. This indicates that the establishment of the biological talent training program had a significant promoting effect on the improvement of pre-service teachers' TPACK level. This provides an important theoretical basis for the training of TPACK level of pre-service biology teachers in this school.

Keywords: Technological Pedagogical Content Knowledge (TPACK), Intelligent-based Teaching Ability, Pre-service Teachers, Normal Biology Student.

I. INTRODUCTION

With the rapid development of Internet intelligent information technology, the application of intelligent information technology in teaching has gradually become the main trend of education in The Times [1-3]. Pre-service teachers in normal colleges/universities are the reserve force for primary and secondary school teachers. Systematic training can improve their ability to master and apply information-based teaching, which will lay a solid foundation for pre-service teachers to become formal teachers in the future [4-7]. Nowadays, middle school biology teachers want to have better development in teaching, which requires them to have the ability to properly integrate intelligent intelligent information technology into biology teaching practice.

The Standards of Educational Technology Competence of Primary and Secondary School Teachers in China also put forward: "The profession of teachers tends to be specialized, and the standard to measure the professional specialization of teachers is the level of teachers' intelligent intelligent information technology level, especially in the special aspects of education [8-11]." Biological experiments are an indispensable part of students' biology learning, and biology and social life are inextricably linked. However, students have no way to practice cutting-edge biological knowledge, which results in their low enthusiasm for biology learning. Therefore, if biology teachers want to better help students understand biological phenomena and increase their interest in learning biology, they need to use intelligent information technology to present the knowledge they need to help students understand and master the knowledge they have learned. In addition, the characteristics of biology also determine that intelligent information technology is indispensable in the teaching process.

The rapid development of the Internet era shows that teachers with higher TPACK level will have better teaching effectiveness in teaching [12-16]. Systematic learning can improve teachers' TPACK level, which is not only a suggestion for in-service teachers, but also provides a reference for learning and teaching for pre-service normal university students who are about to enter teaching positions[17]. According to previous studies, seven factors of the composition of TPACK are explained: Technological Pedagogical Content Knowledge (TPACK) (Table 1).

[1] De La Salle University-Dasmariñas, Dasmariñas, Cavite, Philippines; Zhengzhou Normal University, Zhengzhou, Henan, China
[2] De La Salle University-Dasmariñas, Dasmariñas, Cavite, Philippines; Zhengzhou Technical College, Zhengzhou, Henan, China
[3] De La Salle University-Dasmariñas, Dasmariñas, Cavite, Philippines; Zhengzhou University, Zhengzhou, Henan, China
[4] De La Salle University-Dasmariñas, Dasmariñas, Cavite, Philippines
[5] Zhengzhou Normal University, Zhengzhou, Henan, China
[*]Correspondence Author: Lin Li

Table 1: Descriptive Analysis of TPACK Ability of Biology Students in Various Dimensions

Subdivision of TPACK	Definition	Illustration
Technical Knowledge (TK)	Knowledge of intelligent intelligent information technology (both hardware and software)	Using modern electronic devices such as interactive whiteboards
Content Knowledge (CK)	Knowledge related to the subject	Teaching methods and classroom management
Pedagogical Knowledge (PK)	All knowledge of the processes and methods of teaching and learning	Teaching methods and classroom management
Technological Content Knowledge (TCK)	Use the corresponding intelligent intelligent information technology to present the knowledge of a subject content	Using animation to show the movement of the earth
Technological Pedagogical Knowledge (TPK)	Use appropriate multimedia to support teaching strategies	Finding out how electronic whiteboards can support teaching
Pedagogical Content Knowledge (PCK)	Use strategies to teach knowledge about a subject	Using analogy, example and other strategies to teach a lesson
Technological Pedagogical Content Knowledge (TPACK)	Knowledge of how the emergence of intelligent intelligent information technology affects the organization of subject knowledge and the choice of teaching strategies	Using the corresponding intelligent intelligent information technology to support teaching

With the development of intelligent intelligent information technology, some domestic scholars have also begun to study TPACK, among which, the research on the TPACK level of pre-service teachers is probably divided into the following two aspects: On the one hand, normal colleges and universities provide professional and systematic intelligent intelligent information technology training and learning for teachers majoring in normal education; on the other hand, It is to integrate relevant courses related to the major with intelligent information technology for learning in school.

At present, there are relatively few studies on TPACK of pre-service biology teachers in local normal colleges. This study focuses on the TPACK level of normal biology students, explores its influencing factors, and tries to put forward suggestions for improvement, so as to improve the TPACK level of normal biology students.

II. Results Presentation and Analysis

A. Research Objects

In this study, 283 normal university students majoring in biological science in the fourth grade of Life Science College of X normal university were selected as the research objects. A total of 283 paper questionnaires were issued, and 263 valid questionnaires were recovered, with a recovery rate of 93.4%.The numbers are shown in Table 2.

Table 2: Basic Information Statistics of Biology Normal Students

Grade	Freshman	Sophomore	Junior	Senior	All of them
NO.	65	71	54	77	263
Proportion	24.3%	26.6%	20.2%	28.8%	100%

B. General Descriptive Statistical Analysis of TPACK Ability of Biology Normal University Students

Intuitively, the mean of each part was about 3.4 to 3.6, corresponding to the relative option is between not sure and basically agree. This indicates that the TPACK level of normal biology students is medium and slightly above the level. It can be seen from Table 3 that the average value of TCK was 3.688, while the average value of TK was the lowest in the seven dimensions, and the average value of TPCK was also relatively low. In general, the average value of the study subjects in the seven dimensions was at the medium level, and the TPACK level needs to be further improved through learning and training.

Table 3: Descriptive Analysis of TPACK Ability of Biology Students in Various Dimensions

Dimensions	TK	PK	CK	PCK	TCK	TPK	TPCK
Mean	3.396	3.532	3.580	3.562	3.688	3.565	3.443
SD	0.977	0.881	0.821	0.789	0.796	0.842	0.840

C. Seven Dimensions Analysis of TPACK for all Grade Biology Students

1) Analysis of Technical Knowledge (TK)

According to the information in Table 4, the average value of TK was between 2.9 and 3.9. Among them, TK1 had the highest mean value, and more than 80% of pre-service teachers choose to basically meet and meet, indicating that most of the pre-service teachers have mastered the basic skills of intelligent information technology. TK2 and TK3 had the lowest mean value, indicating that the ability of pre-service teachers to solve the IT hardware or software problems independently needs to be improved. For TK4, it showed that teachers do not often study intelligent information technology.

Table 4: Analysis of Technical Knowledge (TK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
TK1	1.1%	8.0%	7.2%	64.3%	19.4%	3.93	0.898
TK2	6.8%	21.7%	46.4%	22.1%	3.0%	2.93	0,911
TK3	4.2%	19.5%	31.7%	38.5%	6.1%	3.23	0.971
TK4	1.2%	17.7%	18.8%	54.6%	7.7%	3.50	0.911

Note: TK1: master the basic skills of intelligent information technology (such as information search, making PPT courseware, downloading files, etc.); TK2: Can solve some hardware technical problems I have encountered (such as computer screen cannot be projected, network cannot be connected, etc.); TK3: Can solve some software problems encountered (such as failure to insert sound or animation in PPT, etc.); TK4: Frequent use of intelligent information technology in work and study.

2) Analysis of Pedagogical Knowledge (PK)

As can be seen from Table 5, 16.8% of pre-service teachers expressed difficulties in choosing teaching strategies, and 26.7% of pre-service teachers expressed uncertainty. When planning teaching activities, PK3 adjusted its teaching methods according to students' classroom performance and how to evaluate students' classroom performance, the mean scores were the same, and at a medium level.

Table 5: Analysis of Pedagogical Knowledge (PK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
PK1	3.8%	13.0%	26.7%	50.8%	5.7%	3.42	0.922
PK2	3.9%	8.1%	22.5%	58.1%	7.4%	3.57	0.889
PK3	2.7%	8.8%	26.2%	53.5%	8.8%	3.57	0.874
PK4	2.3%	7.7%	28.1%	54.2%	7.7%	3.57	0.833

Note: PK1: Can use different teaching strategies to students according to different teaching contents; PK2: Can plan some learning activities for students (such as cooperative inquiry learning); PK3: Ability to adjust teaching methods according to students' performance or feedback; PK4: Know how to evaluate student performance in the classroom.

3) Analysis of Content Knowledge (CK)

It can be seen from Table 6, the overall level of subject content knowledge (CK) was higher than TK and PK, indicating that pre-service teachers' mastery of subject content is superior to technical knowledge and pedagogical knowledge. Among them, the mean values of CK1, CK3 and CK4 were not much different, indicating that pre-service teachers were relatively balanced in the selection of subject content knowledge, and only the lowest CK2 was 3.51, indicating that pre-service teachers were not skilled in understanding biological subject knowledge and use multiple ways and strategies.

Table 6: Analysis of Content Knowledge (CK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
CK1	0.4%	8.0%	27.6%	56.3%	7.7%	3.63	0.757
CK2	1.5%	10.7%	29.4%	51.9%	6.5%	3.51	0.829
CK3	1.5%	11.2%	21.9%	57.7%	7.7%	3.59	0.845
CK4	1.1%	9.5%	27.0%	53.6%	8.7%	3.59	0.823

Note: PK1: CK1: Have solid knowledge of biology, can meet the requirements of middle school biology teaching; CK2: Can use a variety of methods and strategies to understand the knowledge of biology; CK3: Can use biological thinking to think about problems; CK4: Solid biological experiment skills, able to meet the needs of middle school biology.

4) Analysis of subject pedagogical content knowledge (PCK)

As can be seen from Table 7, PCK4 had the highest mean value, indicating that most students believe that they can still use various learning methods to help students learn without the help of intelligent information technology. The lowest level was PCK3, indicating that teachers still need to improve their ability to promote

students' thinking development and independent thinking. The pre-service teachers' choice of whether PCK1 can make biology teaching plan got 3.52, and the data indicated that 57.2% of the pre-service biology teachers believed that they could make a suitable biology teaching plan. For PCK2 students, the average judgment of knowledge basis that teachers should have before learning a certain biology was 3.62, indicating that normal biology students are in the middle level.

Table 7: Analysis of Subject Pedagogical Content Knowledge (PCK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
PCK1	1.5%	8.8%	32.4%	51.1%	6.1%	3.52	0.801
PCK2	1.9%	6.1%	30.4%	51%	10.3%	3.62	0.825
PCK3	2.7%	7.6%	34.6%	49.0%	6.1%	3.48	0.828
PCK4	2.4%	4.3%	29.0%	56.1%	8.2%	3.64	0.791

Note: PCK1: Can develop appropriate biology teaching plans or programs (such as units or periods, etc.); PCK2: Know the knowledge base that students should have before learning a certain biological knowledge; PCK3: Can use appropriate teaching methods to make students learn and think without using intelligent information technology; PCK4: Not using intelligent information technology, but also using a variety of learning methods to help students understand the learning content (such as wall charts, board writing, etc.).

5) Analysis of Technological content knowledge (TCK)

As shown in Table 8 above, the average value of TCK1 was the highest, and 79.5% of pre-service teachers choose to basically match, indicating that most pre-service teachers can make good use of intelligent information technology to better present biological knowledge. In this part, the TCK3 was 3.54, which is relatively low, and more than 60% of pre-service teachers were basically in line with or above the level, indicating that the overall level of this part is good.

Table 8: Analysis of Technological Content Knowledge (TCK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
TCK1	2.0%	3.5%	15.0%	66.9%	12.6%	3.85	0.757
TCK2	1.6%	5.5%	26.3%	56.9%	9.8%	3.68	0.788
TCK3	1.2%	11.0%	26.7%	54.9%	6.3%	3.54	0.816

Note: TCK1: Can select appropriate intelligent information technology to present biological knowledge (such as pictures, videos, etc.); TCK2: Can use appropriate intelligent information technology to collect information for further research in biological disciplines (such as thematic websites or databases); TCK3: Can use at least one biology software to help understand biological subjects.

6) Analysis of technological pedagogical knowledge

According to the data in the table 9, the highest average value of TPK1 was 3.68. Pre-service teachers can better use intelligent information technology to help themselves convey information. The lowest TPK4 mean was 3.47 and the TPK2 mean was 3.52, indicating that the ability of pre-service teachers to use intelligent information technology to help students cooperate in learning and to use intelligent information technology to evaluate students need to be improved. The ability of TPK3 pre-service teachers to use intelligent information technology to help create teaching scenarios was in the middle level.

Table 9: Analysis of Technological Pedagogical Knowledge (TPK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
TPK1	1.2%	7.9%	24.1%	55.3%	11.5%	3.68	0.824
TPK2	2.8%	8.3%	32.1%	48.0%	8.7%	3.52	0.872
TPK3	2.0%	7.5%	29.4%	52.2%	9.0%	3.59	0.832
TPK4	2.8%	7.9%	34.4%	49.0%	5.9%	3.47	0.834

Note: TPK1: Can use intelligent information technology to help better present the teaching information I want to convey; TPK2: Can use intelligent information technology to better help evaluate students; TPK3: Can use intelligent information technology to better help create teaching situations; TPK4: Can help students use intelligent information technology tools for collaborative learning.

7) Analysis of technological pedagogical content knowledge (TPACK)

As can be seen from the data in Table 10, the overall average was not very high, and the highest average was TPCK2 with 3.57, indicating that 62.4% of pre-service teachers were relatively strong in selecting appropriate intelligent information technology to promote students' learning and improve my teaching ability. TPCK3 had the lowest mean value, and only 43.9% of pre-service teachers thought that they can help other teachers to solve the problem of integration of subject knowledge, intelligent information technology and teaching methods.

Table 10: Analysis of Technological Pedagogical Content Knowledge (TPACK)

Item	Totally agree	Basically agree	Not sure	Basically disagree	Totally disagree	Mean	SD
TPCK1	2.8%	8.7%	29.4%	54.4%	4.8%	3.50	0.830
TPCK2	2.4%	5.9%	29.2%	57.3%	5.1%	3.57	0.782
TPCK3	3.5%	11.4%	41.2%	40.8%	3.1%	3.29	0.842
TPCK4	3.5%	10.2%	32.5%	47.8%	5.9%	3.42	0.883

Note: TPCK1: Can reasonably apply subject knowledge, intelligent information technology and teaching methods comprehensively to classroom teaching; TPCK2: Can select appropriate intelligent information technology in the classroom to promote student learning and enhance teaching ability; TPCK3: Can guide and help other teachers to solve the integration problems of subject knowledge, intelligent information technology and teaching methods; TPCK4: The level of intelligent information technology can meet the overall requirements of the teaching process.

D. Comparative Analysis of TPACK Ability Difference of Biology Normal University Students in Different Grades

Through sorting out and summarizing the questionnaire survey results of biology normal university students in four grades, the difference in TPACK ability of normal biology students in different grades was compared and analyzed, as shown in Figure 1.

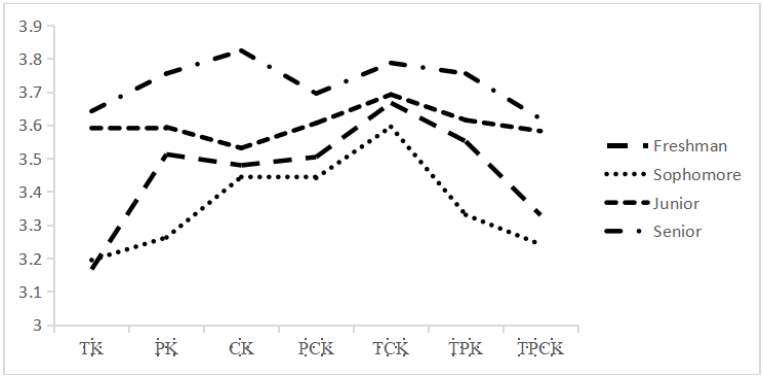

Figure 1: The 7-dimensional Level Curve of the TPACK Framework for the Four Grades Biology Normal University Students

As can be seen from Figure 1, the TPACK level generally conforms to the improvement of the level as the grade increases, but the freshmen and sophomores do not conform to this trend. With the growth of the grade, the knowledge of pedagogy, psychology, teaching materials and modern educational technology is gradually increasing, which indicates that normal education can promote the improvement of students' TPACK level to a certain extent. As freshmen just graduated from high school to university, although they have not received systematic education and teaching knowledge, they have sufficient self-confidence. Moreover, due to their familiarity with teaching content in high school, their overall TPACK level is higher than that of sophomores. Compared with freshmen, sophomores only receive psychology tutorials and computer basics, and their learning is not very systematic. Without practice, the body of knowledge is not formed. In the third year, the knowledge of teachers' professional ethics, biology education and teaching of middle school students was added. Secondly, during the preparation for the teacher qualification examination, systematically and comprehensively reviewed and further studied the previously learned knowledge. During the preparation for the interview, juniors also systematically studied the teachers' teaching skills, teaching contents, teaching methods and other aspects, which also affected the pre-service teachers' TPACK level to a large extent. The seniors have all completed the study of relevant courses, both in terms of education and teaching, and have received some training in teacher education and teaching, and their knowledge in all aspects has been further consolidated, thus promoting the further development of TPACK.

E. Significance Analysis of Seven Dimensions of TPACK among Four Grades Biology Normal University Students

In order to better compare whether there is a significant difference in TPACK level among different grades, and investigate whether normal education can improve students' TPACK level, the difference analysis is carried out between seniors and freshmen, which is denoted as a; The difference analysis between seniors and juniors, which was denoted as b; The difference analysis between juniors and seniors as a whole and freshmen and

sophomores as a whole is denoted as c. SPSS20.0 was used to conduct independent sample T test, and the analysis results were shown in Table 11.

Table 11: Significance Analysis of Seven Dimensions of TPACK Ability in Different Grades

Dimensions	Mean ± SD					P value		
	Freshmen	Juniors	Seniors	Freshmen and Sophomores	Juniors and Seniors	a	b	c
TK	3.17±1.053	3.59±0.823	3.64±0.864	3.18±1.042	3.62±0.847	0.000	0.649	0.000
PK	3.51±0.946	3.59±0.737	3.75±0.730	3.38±0.977	3.69±0.736	0.000	0.032	0.000
CK	3.48±0.825	3.53±0.736	3.82±0.742	3.46±0.851	3.71±0.753	0.000	0.001	0.000
PCK	3.50±0.811	3.61±0.741	3.69±0.764	3.47±0.854	3.66±0.756	0.019	0.267	0.000
TCK	3.67±0.812	3.690.706	3.79±0.749	3.63±0.851	3.75±0.733	0.005	0.690	0.000
TPK	3.55±0.898	3.61±0.781	3.75±0.712	3.43±0.913	3.70±0.743	0.000	0.006	0.000
TPCK	3.33±0.930	3.33±0.930	3.33±0.930	3.28±0.934	3.60±0.700	0.000	0.170	0.000

1) Comparative analysis of TPACK level between seniors and freshmen of biology normal university students.

Comparing the seven dimensions of TPACK ability between seniors and juniors of biology normal university students, the data shows that the average value of senior normal college students in the seven dimensions of TPACK was greater than that of freshman, and the average value difference in TK was the largest, while the difference in PK was relatively small, which indicates that seniors were stronger than freshmen in all dimensions of TPACK ability. The P value of all dimensions was less than 0.05, except for PCK dimension P=0.019, the P value of other six aspects was less than 0.01, indicating that seniors and freshmen had significant differences in TK, PK, CK, TPK and TCK, and significant differences in PCK. Analysis of the reason may be that the TPACK level has been improved through four years of learning pedagogy, psychology, teaching methods and other aspects of knowledge, which shows that undergraduate teacher education can effectively improve students' TPACK level, and the X university has an effective talent training mechanism for undergraduate biology normal students.

2) Comparative analysis of TPACK level between seniors and juniors of biology normal university students.

Comparing TPACK level between seniors and juniors, the research revealed that the average value of each dimension of seniors was slightly higher than that of juniors, indicating that seniors were slightly stronger than juniors in all dimensions on the whole. The average values of PK, CK and TPK were 0.032, 0.001 and 0.006 respectively, all of which were less than 0.05, indicating that there were significant differences in PK between seniors and juniors, and the difference in CK and TPK was extremely significant. The P values of TK, TCK, PCK and TPCK were all greater than 0.05, indicating that there was no significant difference between senior and junior normal college students in TK, TCK, PCK and TPCK. The survey was conducted before the end of last semester, when junior students had completed the study of modern educational technology, had a full understanding of the content of biology, and were preparing for the teacher qualification examination. As of the survey time, seniors have not gone through educational practice, so there was no significant difference in their performance compared with seniors. In the second semester of junior year, seniors had systematically learned the teaching theory of biology courses, and in the first semester of senior year, they also learned the training of biological skills, which has higher requirements for intelligent information technology, teaching method and subject knowledge. Seniors had mastered the teaching method at this time, and it is also good to integrate intelligent information technology and teaching method. It shows that microtraining of teaching skills is of great help to improve PK, CK and TPK of normal university students.

3) Comparative analysis of TPACK level between juniors and seniors as a whole and freshmen and sophomores as a whole.

Although X Normal University began to offer education courses in sophomore year, the study was at the end of last semester, and sophomores only learned one course of psychology and student psychological development. Therefore, the study combined freshman and sophomore as a whole with junior and senior as a whole to explore whether teaching courses have a significant impact on the improvement of normal university students' TPACK level. The study found that the mean value of each dimension of juniors and seniors was higher than that of freshmen and sophomores, indicating that juniors and seniors had higher TPACK level than freshmen and sophomores. All the seven dimensions of P-value were 0.000, indicating that the difference between the two was very significant. It is speculated that this may be related to the content of education and teaching carried out by the school. The juniors and seniors learned more about the special training knowledge of education and teaching, while the freshmen and sophomores only have sophomores just contact with the content of psychology. This

shows that X University's education courses for normal students can improve the TPACK level of normal students to a large extent.

III. DISCUSSIONS

The study found that the overall TPACK level of pre-service biology teachers in a school was at the middle level, with the lowest level of TK and the second level of TPCK. The TPACK of senior normal students is higher than that of freshman and junior normal students, and the TPACK of senior normal students is higher than that of sophomore normal students. This paper provides some reference suggestions for the improvement of TPACK level of normal students majoring in biological science, and gives some theoretical guidance for their future teaching work.

Through the analysis of the TPACK levels of all the biology students in X Normal University, it was found that the TPACK level is in the middle level. This is the same as the results obtained by Dai et al. [18] from Central China Normal University for Central China Normal University and Changhua Normal University. However, the study found that the average TPACK level of biology normal university students in X Normal University is lower than that of normal biology students in Central China Normal University and Changhua Normal University in Taiwan in all dimensions, especially in the three dimensions of TK, PCK and TCK. Changhua Normal University students perform well. For the biology students of X Normal University, the scores from high to low was TCK>CK>TPK>PCK>PK>TPCK>TK, and the average value of TK was the lowest, which may be related to the students' lack of proficiency in intelligent information technology. The highest average value was TCK, indicating that the subject content knowledge of integration technology is better mastered. Changhua Normal University has the highest TK value.

The study compared the TPACK dimensions of seniors and freshmen to analyze the impact of four years of undergraduate study on TPACK of biology normal university students. It was found that there were significant differences in each dimension, which indicates that undergraduate education can effectively improve the TPACK level of biology normal university students. This is consistent with the conclusion obtained by Dai et al. and Nagy et al. [18-19] on the research of Biology students of Central China Normal University.

The comparison between seniors and juniors in X Normal University shows that there were significant differences only in CK and TPK, but no differences in other dimensions. There were differences between the two studies and Ye et al. [20], which may be due to the fact that senior normal students in Yulin Normal University have gone through educational practice and combined theoretical knowledge with practice, so their TPACK level has been greatly improved for the junior year [21-22]. The internship time of students of X Normal University is generally arranged in the second semester of the senior year, so although the senior year was slightly higher than the junior year, the difference was not significant.

Comparing the juniors and seniors as a whole with the freshmen and sophomores as a whole, it was found that there were significant differences in each dimension. In Central China Normal University, only TPCK had no significant difference, while other dimensions had significant difference. This shows that the teacher education courses offered by X Normal University can improve the TPCK level of students, and had greatly improved compared with the freshmen and sophomores, and can better integrate various knowledge.

IV. CONCLUSIONS

Based on the above analysis, the following suggestions are put forward for the improvement of TPACK ability of biology students in X Normal University:

- Pre-service teachers take the initiative to improve their own intelligent-based teaching ability. Pay attention to the development of The Times, understand the cutting-edge information of the discipline, and pay attention to improving TPACK ability. In daily learning, pre-service teachers attach importance to the comprehensive application of intelligent information technology, teaching method, teaching content, and TPACK. In today's rapidly changing intelligent information technology, they should combine intelligent information technology with education and teaching, enrich their teaching content, and improve their TPACK level by referring to domestic MOOC or micro-video.
- School improvement. Integrate intelligent technology curriculum theory and practice. It is suggested to increase the number of electives related to information teaching technology and appropriately expand the proportion of class hours.

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