

Development and Improvement of Teaching Ability of University Teachers in the Context of Mobile Learning

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Abstract: The quality of university teaching depends on the teaching ability of university teachers, and high-level education can enable students to learn more efficiently, thereby improving the quality of university education. This article adopts a comparative research method to showcase some of the main existing non mobile learning modes, such as centralized face-to-face teaching, online learning, and teacher based research. It has conducted in-depth exploration on the development of teaching abilities of school teachers from multiple perspectives such as theoretical basis and value perspective. It is supplemented by survey methods to explore the problems faced by the application of mobile learning in the process of cultivating the teaching ability of school teachers, in order to solve the bottleneck that restricts their development of teaching ability. This article constructs a set of basic methods and practical strategies for developing teaching abilities of school teachers based on mobile learning. During the first exam, the average score for the class that did not use mobile learning technology was 75 points, while the average score for the class that used mobile learning technology was 81 points. This article not only contributes to the growth of individual teachers, but also plays an important role in improving the overall quality of the teaching staff.

1. Introduction

New teachers are responsible for a large amount of teaching work and play an important role in talent cultivation in schools. However, most new teachers graduate from non-normal universities without systematic teacher training, resulting in insufficient preparation for practical teaching abilities. In addition, new teachers are more or less responsible for some research work and cannot focus all their energy on teaching. Even if the best graduates from various universities and majors are recruited, it only indicates that "scholars" are not necessarily good teachers. Therefore, promoting the entry of new university teachers into educational work and promoting them to continuously improve their teaching level in teaching work is currently the primary task of all universities, and it is also the fundamental guarantee for comprehensively promoting quality education and strengthening the construction of teaching staff.

Many universities in China have also established educational research institutes, higher education research institutes, teacher training centers, or further education centers, but these

organizations are difficult to integrate with the main culture of universities and often become a foil or accessory to universities, at a marginal position. At the same time, it is limited by various factors and cannot truly participate in teacher training, which has a very limited impact on teacher education. Huang Yongxue believes that young teachers account for a large proportion in the higher education system, and their teaching abilities directly promote the quality of teaching and talent cultivation in a school [1]. Lou Hangfang plans to use literature review and other research methods to analyze the current teaching ability of “dual teacher” teachers in medical colleges. He explored ways to improve the teaching ability of “dual teacher” teachers, and used the actual and educational effects of teacher education development to support [2]. According to the methods of teacher training and evaluation, Li Yizhen suggests that teachers should conduct teaching evaluations through student evaluation, teacher self-evaluation, and supervisory evaluation, which can help improve the development of teaching abilities of university teachers [3]. However, their research data is insufficient, which is not conducive to the development of teachers' teaching abilities.

This article provides a preliminary explanation of the development of teaching ability for school teachers in a mobile learning environment, defining concepts such as "teaching ability", "teaching ability development", and "mobile learning". It explains the essential characteristics of mobile learning for school teachers, in order to raise awareness among school teachers and relevant educators about the correlation between mobile learning and the cultivation of school teachers' teaching abilities, and to better play its role in the construction of school teachers' teaching abilities [4].

2. Approaches to Developing Teaching Ability of School Teachers on Mobile Learning

In today's internet age, almost everyone has their own mobile phone, through which they engage in rich and colorful social activities and obtain rich and colorful online information. Both school teachers and education experts live to some extent in this mobile digital world. Mobile learning platforms and devices integrate the learning resources required for cultivating the teaching abilities of school teachers, organizing teachers with common teaching ability development needs, experts and scholars with different professional strengths, etc., into a virtual learning space. In this way, school teachers can utilize the unique browsing, communication, storage, and recording functions of mobile learning devices to obtain certain learning resources and manpower support. It integrates specific content of mobile learning into daily educational practices to cultivate students' teaching abilities.

Although effective learning may occur when the teaching efficiency of university teachers is not high, effective teaching by university teachers can better promote students' effective learning. The quality of teaching in universities is influenced by many factors, and the teaching ability of university teachers is one of them. This article selects new teachers as the research object, focusing on the development of their teaching abilities, until they continuously strengthen the learning awareness of new university teachers and master their current educational methods, in order to improve their theoretical level. It can strengthen students' learning ability and cultivate their hands-on ability; It can strengthen scientific research, enhance creativity, and promote the development of new teachers' educational abilities.

2.1 Online Browsing

Online browsing refers to teachers accessing teaching servers through GPRS or WiFi based on the development needs of their teaching abilities, using the network services of mobile teaching devices. For example, in the National Teacher Education Network Alliance, the National School Teacher Continuing Education Network, the School Education and Information Research Network,

the Subject Teaching Network, the Education Blog, the Education WeChat platform, the Education Forum, China Education News, etc., users can obtain specific teaching knowledge, teacher education resources, and subject teaching resources through browsing and searching on the network [5]. The content browsed online can take various forms, including educational ideas presented in text form, cutting-edge theoretical knowledge of education, teaching cases, teaching stories, new book recommendations, teaching experiences, etc. It can also be presented in the form of educational lectures, classroom teaching records, etc., in the form of videos. This online browsing method enables teachers to quickly and effectively access teaching resources from any learning location, and to update their knowledge systems in real-time.

Teaching ability evaluation indicators P_Z [6-7]:

$$P_Z = (TC + TF + TS) / 3 \quad (1)$$

Among them, TF represents the teaching ability evaluation score; TC represents the classroom control score during the teaching process. Comparison formula for teaching effectiveness J_G [8]:

$$J_G = (TG - CG) / CG * \beta \quad (2)$$

Among them, TG represents the grades or performance achieved by students after teaching [9-10].

2.2 Offline Viewing

Mobile teaching devices generally have large storage capacity and can carry teaching resources presented in the form of text, audio, video, etc. Teachers can download various teaching materials on their phones for students to watch offline [11]. This offline browsing method allows teachers to break through the limitations of web-based mobile learning technology, allowing them to carry a vast treasure trove of knowledge. This can not only save teachers the cost of purchasing paper books, but also prevent them from carrying so many books on their backs. Especially with the widespread recognition of the concept of lifelong education and the rise of a learning society, mobile libraries are currently in full swing. Various e-books are popular in PDF format, txt format, doc format, and other formats, which can build a new teaching model based on online teaching [12-13].

2.3 Instant Communication

Instant communication refers to the use of mobile learning devices, where school teachers can communicate with teachers or educational experts at any time regarding a specific educational topic or problem encountered in teaching. Interactive information such as voice calls, text message editing, online messages, video chats, and sending emails on mobile phones can help teachers achieve peer assistance and receive professional guidance from education experts. Peer assistance refers to the construction of a mobile learning community for teachers by sharing teaching experience and making full use of social media such as QQ, Feixin, and WeChat. Through democratic and fair communication, it promotes teachers' professional growth [14]. For example, when a teacher encounters some difficult problems and confusions in teaching practice, they can engage in dialogue and seek the opinions and suggestions of other teachers [15]. The teaching ability of school teachers needs to be reflected in specific teaching activities. Therefore, members of the teacher mobile learning community can share high-quality educational and teaching resources such as lesson plans, classroom recordings, educational reviews, and educational stories. They can also upload their satisfactory teaching video clips, teaching cases, teaching stories, etc., online for communication and discussion with other teachers [16].

Through the career oriented development path of mobile learning, school teachers have more opportunities to engage in dialogue with education experts. At the same time, it can also achieve fair and effective use of high-quality teacher education resources, especially to help solve the problem of limited professional growth of rural school teachers due to the shortage of education funds and the difficulty in obtaining high-quality teaching resources [17-18]. According to the initiative of experts in career orientation, professional orientation based on mobile learning can be divided into two types: one is based on active guidance from school teachers, and the other is guided by experts. The professional guidance of active tutoring by school teachers is based on a high degree of self-awareness towards their own professional development and full recognition of experts by teachers. It refers to the activities where school teachers encounter problems in the teaching process and teaching ability development, and use various methods such as SMS, email, and online messages to seek advice from experts on coping strategies. It can also enable school teachers to obtain the latest educational theory knowledge and high-quality teaching resources from experts. Expert guided professional guidance requires experts to have a strong sense of responsibility. They regularly track the teaching abilities of school teachers through mobile devices, identify deficiencies in their development of teaching abilities, analyze their causes, and apply them to school teachers' mobile learning platforms [19].

2.4 Always Reflect

Many school teachers are often busy with their own educational work and do not have time to reflect on teaching. Sometimes they only provide a rough review of the teaching process of a class, reflecting on key issues in the teaching process, without being able to delve deeper into teaching reflection and timely display the results of teaching reflection [20]. Mobile phones are generally equipped with powerful notepads compatible with Office Word software, and can create corresponding teaching and thinking files. In addition, mobile terminals also have the ability to edit text using mobile internet technology, allowing school teachers to reflect on paperless teaching at any time and place. This allows school teachers to present their teaching reflection process and results in real-time. It is possible to become a norm at any time and place, enabling teachers to timely capture fleeting insights in the classroom, thereby enhancing their reflective awareness and ability [21-22].

3. Exploration Results of Improving Teachers' Teaching Ability

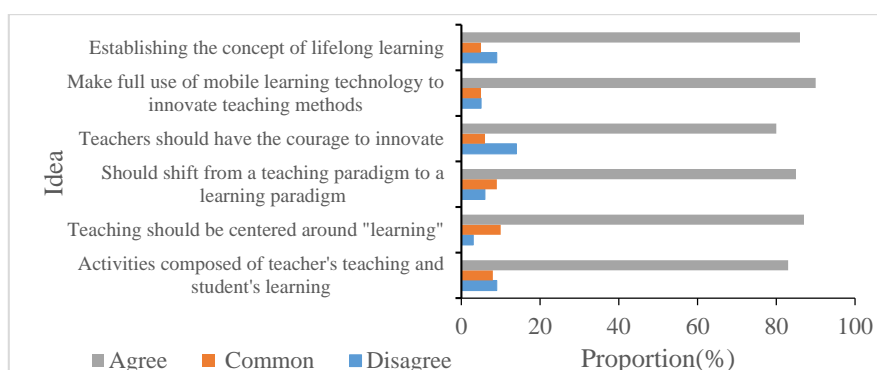


Figure 1: Survey on Teachers' Concept of Mobile Learning

The survey on teachers' concept of mobile learning is shown in Figure 1. For the concept that teaching is a joint activity of teachers' teaching and students' learning, 83% agree and 9% disagree. For the concept of fully utilizing mobile learning technology to innovate teaching methods, 90%

agree and 5% disagree.

The basis for formulating teacher teaching content is shown in Table 1. Combining professional characteristics and needs accounts for 50%, which is relatively high. Professional talent training programs account for 30%. The proportion of student needs is only 9%, and the basis for teachers to develop teaching content in this area needs to be strengthened.

Table 1: Proportion of teachers' teaching content development basis

Serial number	Characteristic items	Proportion (%)
1	Combining professional characteristics and needs	50
2	Teacher's knowledge reserve	11
3	Student needs	9
4	Professional talent training plan	30

The teaching interaction survey of teachers is shown in Figure 2. The experiment randomly checked the teaching situation of the class 10 times, with an average of 49.6% having frequent interaction, 29.3% having little interaction, and 21.1% having little interaction.

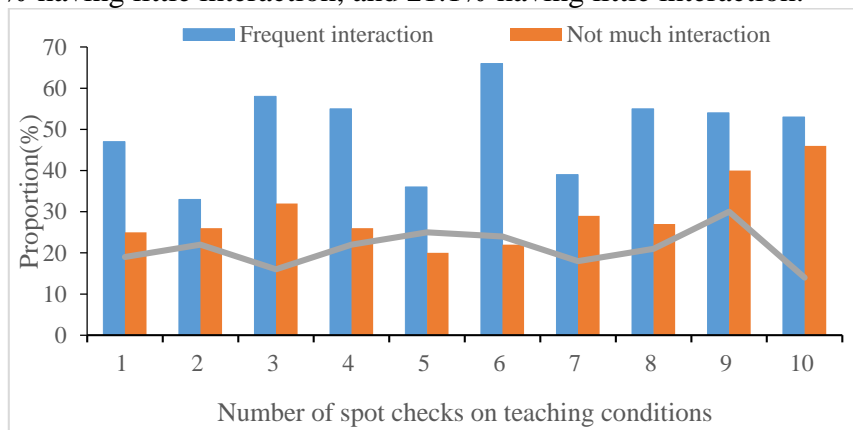


Figure 2: Survey of Teaching Interaction among Teachers

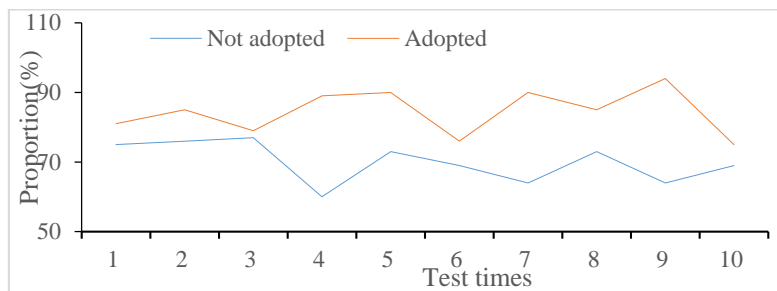


Figure 3: Comparison of exam scores between students using and not using mobile learning technology

The teaching ability of teachers is to some extent reflected in students' academic performance. The comparison of exam scores between students who use mobile learning technology and those who do not is shown in Figure 3. This article conducted a total of 10 exams, taking the average for comparative analysis. During the first exam, the average score for the class that did not use mobile learning technology was 75 points, while the average score for the class that used mobile learning technology was 81 points. In the second exam, the average score of the class that did not use mobile learning technology was 76 points, while the average score of the class that used mobile learning technology was 85 points. During the ninth exam, the average score for the class that did not use

mobile learning technology was 64 points, while the average score for the class that used mobile learning technology was 94 points.

4. Discussions

From the comparative analysis of the training mechanisms in universities, it can be seen that there is indeed a certain gap in China's teacher development projects compared to universities in other countries. This gap comes from both institutional factors within the institution itself and external factors within the education environment, as well as teachers themselves. The external environment mainly refers to the social environment and school environment. In recent years, China's higher education has implemented a series of reform measures, such as expanding the autonomy of universities and creating convenient conditions for university teachers to better exercise academic power. However, there are also issues that cannot be ignored in this process. For example, there are phenomena such as academic corruption and uneven quality of university teachers in the teaching staff. Therefore, the education industry is a large ecosystem, and the atmosphere of this ecosystem would affect the thinking and cultural behavior of teachers. The personal factors of university teachers are also an important aspect. The personal factors of university teachers are usually reflected in the differences in expectations given by role players and roles, mainly due to the differences in teachers' qualities and abilities in knowledge, experience, teaching methods, and other aspects.

(1) Ensure the conditions for the development of teachers' teaching abilities

Students in higher education institutions are learners, and teachers are also learners. Teachers' learning is the continuous self-enrichment after establishing a lifelong learning concept, and school training is also an important way for teachers' self-development. Therefore, school-based training in higher education institutions is a necessary condition to ensure the development of new teachers' teaching abilities. Although many universities have the form of school-based training, many school-based training suffer from the drawbacks of "short-term behavior" and "face saving engineering", which seriously affect the personal development and professional growth of teachers. Therefore, while universities cultivate teachers, they should also closely integrate this training with their teaching work, with the aim of improving teachers' teaching abilities, and make promoting the cultivation of new teachers' teaching abilities the central role that schools should play.

Teachers should be regarded as assets of the school, focusing not only on how much value they bring to the school, but also on how they enhance their ability to create value. They can be seen as a carrier of teacher growth, enhancing their understanding of creating necessary conditions for the development of their teaching abilities.

Campus culture can be created based on collaboration and professional exploration. Campus culture has a profound impact on teachers and students, which is not only related to their career development, but also to their physical and mental development.

The starting point of a teacher's career has been defined and divided into stages. Whether they are new or old teachers, their career is a part of their career, a part of their past development, and a part of their future development. The role of schools for new teachers would not end with their job positions, as they are at different stages of development and therefore require different types of assistance;

In daily management activities, more attention should be paid to teachers' growth strategies. School is the main body of teacher education, which is not only the main body of teacher education, but also an important component of teacher education. Training for new teachers can be carried out based on this principle. This not only enhances their educational awareness, but also strengthens their campus culture, which has profound significance for their long-term development.

(2) Strengthen the assessment of teachers' teaching ability development

As mentioned earlier, many schools in China pay attention to and support the work of teaching and research groups, respect students, love students, combine disciplines with modern educational technology, and grasp teaching content as the basis for evaluating teachers. At present, the "excessive flexibility" evaluation indicators of Chinese school teachers have significant issues such as ambiguity, flexibility, generality, and universality, which cannot be a direct basis for their evaluation. It can generally be transformed into evaluation criteria with behavioral characteristics, descriptive evaluation criteria, or quantitative evaluation criteria. To achieve quantifiable standards with descriptive and behavioral characteristics, it is necessary to pay attention to the following points:

The system design is rigorous, the evaluation program is complete, and has high operability. The school has detailed regulations and responsibilities for various aspects of evaluation work, such as evaluators, teachers themselves, and principals. The system has clear time limits for completing each step, ensuring the quality and efficiency of the system during execution.

The assessment standards are clear, detailed, and require strict requirements. The evaluation standards of the teacher professional development evaluation system are very detailed and have their own evaluation standards in various aspects, allowing teachers to follow certain standards and continuously improve their professional behavior;

Introducing teachers in the evaluation has improved the democracy and transparency of the evaluation. When evaluating, teachers can use their own reports for self-evaluation or raise questions about the evaluation committee's evaluation. At the same time, they also have the right to understand the evaluation data and the evaluation process. It can be said that the participation in the entire process maximizes the enthusiasm of teachers.

Clear goals and commitment to improving teachers' teaching abilities: The graded evaluation of teachers in this system is not an end, but a beginning. On this basis, teachers can have a clear understanding of their abilities and shortcomings based on evaluation, in order to determine their career development starting point. They can actively improve their professional abilities and promote their career development through improvement plans formulated together with the evaluation committee;

Emphasis on practice: In the teaching process, the teacher's professional development evaluation system focuses on the evaluation and requirements of teachers, and also focuses on their teaching behavior. Therefore, the evaluation results are more objective and authentic. (3) Optimize the development platform of teachers' teaching abilities.

Universities can integrate the power of these organizations through structural adjustments and institutional restructuring, with education colleges as the main force based on teacher education planning. Compensatory support can be provided in policies, funds, and public opinion to enable it to undertake various tasks such as educational theory research, teacher training, and educational decision-making consultation after gradually becoming stronger, in order to win the recognition and support of the school through effectiveness. The "universalization of teacher education" can better play the role of a teacher education platform. On this platform, teachers can exchange experiences and ideas through seminars, teaching observations, individual tutoring, and other means. In the transmission and sharing of knowledge, opportunities for collaboration among teachers are enhanced, creating a learning atmosphere of mutual learning and promotion, allowing teachers to communicate and engage in their own practical activities. Through continuous learning, reflection, and problem-solving, one can gain more understanding, and experience of teaching, and acquire knowledge and wisdom related to specific situations. This can accumulate rich practical teaching experience and improve the proportion of practical knowledge in the teacher's knowledge system. Teachers can exchange their teaching experiences, implement new curriculum standards, and

research procedures, enabling them to learn within the organization in a continuous learning process, thereby enhancing their personal qualities and cultivating the innovation and collaboration abilities of team members.

5. Conclusions

Mobile learning, as an alternative method and tool, has created a comprehensive learning environment for the construction of teaching abilities of school teachers. Therefore, this article combines mobile learning theory with environmental theory, organically combining learning concepts and methods. In addition, in order to promote the improvement of teaching abilities of school teachers, mobile learning can become a learning method that helps school teachers carry out school-based teaching research and teacher training. It is also a learning method that allows school teachers to independently improve in their free time. It would provide educational knowledge and learning resources support for the development of school teachers' teaching abilities, and integrate them into their daily lives. Therefore, it not only considers its use in the formal learning field of school teachers, but also its application in the informal learning field of school teachers. From the perspective of external conditions, this is inseparable from the strong support of the country, society, schools, and other aspects, especially the current limited mobile learning platforms and resources for teachers. It mainly utilizes online learning platforms, and the learning resources are mainly hierarchical network resources, lacking platforms and resources suitable for its own characteristics. In future academic research and educational practice, it is necessary to unite various forces to lay a solid foundation for teachers' mobile learning, create a teacher oriented mobile learning environment, and provide better guarantees for promoting the improvement of teaching abilities of school teachers.

References

- [1] Huang Yongxue, Wang Fengji, Huang Fei. *Research on constructing a model to enhance the teaching ability of young teachers in private colleges and universities*. *Educational research*, 2021, 4(5):15-18.
- [2] Lou Hangfang, Gong Jie, Hu Junjiang. *Empirical research on the integration of five techniques to enhance the teaching ability of "dual-teacher" teachers combined with medical education*. *Journal of Zhejiang University of Traditional Chinese Medicine*, 2021, 045(006):596-602.
- [3] Li Yizhen. *Evaluation results and statistical analysis of the teaching ability of clinical teachers of physical therapists: Taking a regional teaching hospital in central China as an example*. *Journal of the Physical Therapy Society*, 2019, 44(4):287-288.
- [4] Abacioglu C S, Volman M, Fischer A H. *Teachers' multicultural attitudes and perspective taking abilities as factors in culturally responsive teaching*. *British Journal of Educational Psychology*, 2020, 90(3): 736-752.
- [5] Baier F, Decker A T, Voss T, et al. *What makes a good teacher? The relative importance of mathematics teachers' cognitive ability, personality, knowledge, beliefs, and motivation for instructional quality*. *British Journal of Educational Psychology*, 2019, 89(4): 767-786.
- [6] Burak S. *Self-efficacy of pre-school and primary school pre-service teachers in musical ability and music teaching*. *International Journal of Music Education*, 2019, 37(2): 257-271.
- [7] Copur-Gencturk Y, Cimpian J R, Lubienski S T, et al. *Teachers' bias against the mathematical ability of female, Black, and Hispanic students*. *Educational Researcher*, 2020, 49(1): 30-43.
- [8] Dewi P Y A, Primayana K H. *Effect of learning module with setting contextual teaching and learning to increase the understanding of concepts*. *International Journal of Education and Learning*, 2019, 1(1): 19-26.
- [9] Farmer A. *The impact of student-teacher relationships, content knowledge, and teaching ability on students with diverse motivation levels*. *Language Teaching and Educational Research*, 2018, 1(1): 13-24.
- [10] Ivanec T P. *Exploring pre-service teachers' emotional competence and motivation for the choice of a teaching career*. *International Journal of Learning, Teaching and Educational Research*, 2020, 19(12): 230-245.
- [11] Kong S. *Practice of College English Teaching Reform Based on Online Open Course*. *English Language Teaching*, 2019, 12(5): 156-160.
- [12] Kusumaningrum D E, Sumarsono R B, Gunawan I. *Professional ethics and teacher teaching performance:*

- Measurement of teacher empowerment with a soft system methodology approach. International Journal of Innovation, Creativity and Change*, 2019, 5(4): 611-624.
- [13] Lytzerinou E, Iordanou K. Teachers' ability to construct arguments, but not their perceived self-efficacy of teaching, predicts their ability to evaluate arguments. *International Journal of Science Education*, 2020, 42(4): 617-634.
- [14] Martin F, Budhrani K, Wang C. Examining faculty perception of their readiness to teach online. *Online Learning*, 2019, 23(3): 97-119.
- [15] Mousavian S, Siahpoosh H. The Effects of vocabulary pre-teaching and pre-questioning on intermediate Iranian EFL learners' reading comprehension ability. *International Journal of Applied Linguistics and English Literature*, 2018, 7(2): 58-63.
- [16] Pertiwi C M, Rohaeti E E, Hidayat W. The Students' mathematical Problem-Solving Abilities, Self-Regulated Learning, And Vba Microsoft Word In New Normal: A Development Of Teaching Materials. *Infinity Journal*, 2021, 10(1): 17-30.
- [17] Simamora R E, Saragih S. Improving Students' Mathematical Problem Solving Ability and Self-Efficacy through Guided Discovery Learning in Local Culture Context. *International Electronic Journal of Mathematics Education*, 2019, 14(1): 61-72.
- [18] Starkey L. A review of research exploring teacher preparation for the digital age. *Cambridge Journal of Education*, 2020, 50(1): 37-56.
- [19] Tatminingsih S. Teaching Practice Patterns in ECE Teacher Program in Distance Education in Indonesia. *Journal Obsesi: Journal Pendidikan Anak Usia Dini*, 2020, 5(1): 857-868.
- [20] Tondeur J, Scherer R, Baran E, et al. Teacher educators as gatekeepers: Preparing the next generation of teachers for technology integration in education. *British Journal of Educational Technology*, 2019, 50(3): 1189-1209.
- [21] Su Yawen, Chen Guofu, Li Moyan. Comprehensive Evaluation of Teaching Ability Based on Network Communication Environment. *Wireless Communications and Mobile Computing*, 2021, 12(1):10-12.
- [22] Wiens P D, LoCasale-Crouch J, Cash A H, et al. Preservice teachers' skills to identify effective teaching interactions: Does it relate to their ability to implement them. *Journal of Teacher Education*, 2021, 72(2): 180-194.