

A brief analysis on the cultivation of teaching practice ability of biology students in local colleges and universities under the background of new curriculum standards

Jibo Ma

College of Biology and Brewing Engineering, Taishan University, Tai'an, 271000, China

Abstract: *Under the background of the new curriculum standard, this paper analyzes the current situation of the teaching practice ability training of students with biology as their major in normal universities in local universities, and puts forward several paths, such as clarifying the training objectives, optimizing the curriculum setting, adhering to the practice teaching orientation, strengthening the interdisciplinary integration education and comprehensive quality training, and improving the practice teaching evaluation system. The aim of this paper is to provide reference and help for the cultivation of teaching practice ability of students with biology as their major in local normal universities and colleges.*

Keywords: *new curriculum standards, local colleges, students with biology as their major in normal universities, teaching practice ability*

1. Introduction

In April 2022, the Ministry of Education issued *The Compulsory Education Curriculum Plan and Curriculum Standards (2022 Edition)* (hereinafter referred to as the new curriculum standards). The new curriculum standard, based on the core literacy requirements, selected course content, involving interdisciplinary knowledge and practice requirements. In addition, according to the development level of core literacy, the depth and breadth of teaching are clarified, and teaching evaluation and examination proposition suggestions are further refined to make teaching, learning and examination consistent^[1].

Local undergraduate colleges bear the important task of supplying excellent middle school biology teachers for local education school. Under the background of the new curriculum standard, how to improve the teaching and practical ability of students with biology as their major in normal universities to meet their mission of fulfilling the requirements of the new era faster and better in the future is an urgent task faced by the teaching reform of normal education in local colleges.

2. The new curriculum standard making demands of the teaching practice ability of students in normal universities

2.1 In-depth understanding of the new biology curriculum standards

Normal university students should analyze the new curriculum standards, clearly understand the concept, objectives, content requirements and implementation suggestions. They need to understand the direction and focus of the reform, so as to better carry out and implement the new curriculum concept in the future teaching.

2.2 Updating and improving the knowledge structure

Students with biology as their major in normal universities need to master the basic concepts, principles and methods of biology, understand its application in practice. They also need to track the forefront and dynamics of professional development, and be familiar with the knowledge system required for the cultivation of core qualities and key abilities in the new curriculum standards.

2.3 Improving teaching skills and practical ability

Normal university students should actively participate in educational practice, microteaching, teaching observation and other practical activities, constantly enrich their teaching experience. And they also need to bear the awareness and initiative to use information equipment, software, artificial intelligence and other modern information technology for teaching.

2.4 Cultivating innovation awareness and scientific research ability

In order to cope with the teaching problems in the future, normal university students can enhance their innovative consciousness and scientific research ability through scientific research projects and academic activities. This not only improves job opportunities, but also provides strong support for future teaching.

2.5 Interdisciplinary integration ability

Students with biology as their major in normal universities should integrate biology knowledge with other disciplines effectively and cultivate their interdisciplinary integration ability to meet the needs of future education. The ability to integrate knowledge from mathematics, chemistry, physics, computers and other related disciplines into biology to build more comprehensive and accurate models.

3. Current situation of teaching practice ability training of students with biology as their major in normal local universities and colleges

The curriculum teaching of local colleges and universities covers biological science specialized courses, normal education courses and other courses, and often carries out practical teaching in the form of educational study, internship and practice. However, restricted by conditions, development level and other factors, the following problems often occur in the training process of students with biology as their major in local normal universities and colleges:

(1) At present, in some local colleges and universities, there is a problem that the connection between setting goals and achieving goals is fuzzy when formulating and implementing the training goals of normal biology students.

① The setting of training objectives lacks relatively unified standards and basis, resulting in too general or vague training objectives.

Training objectives are not closely integrated with the curriculum, and it is difficult for students to effectively transform the knowledge and skills learned into teaching practice ability, and the expected effect of training objectives cannot be achieved. Coupled with the lack or imperfection of corresponding training paths, the actual goals achieved by students during school do not match the training objectives.

② Some local colleges and universities put too much emphasis on common requirements while neglecting differentiated teaching.

Some local colleges and universities adopt a single teaching mode and lack special teaching strategies when cultivating students with biology as their major in normal universities, which makes it difficult for students to give play to their own strengths and advantages in teaching practice. Students are unable to find practical content and methods suitable for their own development, resulting in their enthusiasm and initiative is not strong. This may make students less competitive in their future career development.

③ Some local colleges and universities are faced with the problem of mismatch between the training of students with biology as their major in normal universities and the actual demand, and the students are faced with the dilemma of being incompetent in basic education affairs.

Some colleges put too much emphasis on the teaching of theoretical knowledge, and the training of practical skills has not been effectively paid attention to. Although students have mastered rich theoretical knowledge after completing their studies, they lack practical teaching experience and are difficult to be qualified for teaching work. In some places, students have little practice, and their knowledge and skills have not been effectively applied in teaching practice.

(2) Some local colleges and universities are faced with the problem of insufficient number of biological teachers, which not only increases the teaching burden, but also leads to uneven teaching

quality.

① There is a shortage of college teachers with biological pedagogy background. Due to various reasons, such as recruitment difficulties and teacher turnover, the number of full-time teachers with biological pedagogy background is seriously insufficient. There are not enough teachers to give effective guidance and evaluation in the practice of education practice and microtraining.

② The lack of professional teachers cannot ensure the quality of practical teaching of normal university students. Some local institutions have had to lower recruitment standards or rely on part-time faculty to fill vacancies. The overall quality of teachers is not unified, resulting in uneven teaching quality.

(3) In the practical training of students with biology as their major in local normal universities, the practical links are relatively thin, which restricts the improvement of students' teaching practice ability and future career development [2].

① Short internship time: The educational internship time arrangement of some colleges and universities is short, and students cannot contact the different links involved in teaching practice, so the practical experience is slow to acquire.

② Insufficient internship guidance: Professional teachers have limited guidance experience, or fail to provide adequate guidance and support in the internship process, and the problems encountered by students will affect their own development because they are not solved in time.

③ Simple internship content: Some colleges and universities have relatively simple internship arrangements, lacking diversity and innovation. The relatively fixed teaching scene and teaching mode make students' teaching practice ability cannot be fully developed.

④ Imperfect practical teaching resources: When practical teaching resources are relatively scarce, it is difficult for students with biology as their major in normal universities to have in-depth experience and perception of the vocational characteristics and requirements of the education industry, which will increase the difficulty of adaptation to their future career development.

(4) The maturity of the practical teaching evaluation system will have a profound impact on the evaluation and guidance of students' teaching practice ability.

① Incomplete evaluation standards: Due to the lack of relatively standardized evaluation standards in some local colleges and universities, the evaluation process cannot be well recorded, and the process of teaching practice ability training cannot be truly reflected, resulting in the subjective and arbitrary phenomenon of teaching evaluation.

② The mechanism of evaluation method is not flexible enough: the evaluation of teaching practice ability of students with biology as their major in normal universities is mainly based on examination results, and lacks a comprehensive evaluation of students' actual teaching ability. Some colleges and universities rely too much on the traditional written test or trial teaching and other single evaluation methods, and fail to evaluate in combination with the requirements of the development and the needs of curriculum standards reform, resulting in problems such as lag and ineffectiveness of evaluation effect.

③ Incomplete feedback mechanism: Some colleges and universities lack follow-up training of normal students' practical ability when they lack feedback mechanism after evaluation. Students do not know the reason and lack continuous improvement, which limits the improvement of teaching practical ability.

4. Exploration on the cultivation of teaching practice ability of students with biology as their major in normal universities and colleges

4.1 Defining cultivation objectives and strengthening the connection between training objectives and curriculum

(1) We need to make clear the cultivation goal of teaching practice ability of students with biology as their major in normal universities. Local colleges and universities should combine social needs, education reform requirements and students' actual conditions to make training goals concrete and achievable. The cultivation objectives are decomposed into specific curriculum objectives and practice objectives to ensure that the implementation of training objectives can be quantified and get real feedback.

(2) The actual situation of the curriculum should be taken into account. According to the cultivation objectives, we need to adjust and optimize the curriculum of students with biology as their major in normal universities, and increase the courses closely related to the cultivation of teaching practical ability, such as teaching methods and educational technology courses.

4.2 Optimizing course groups, expanding practical teaching resources, and constantly improving professional quality

(1) The curriculum needs to be constantly optimized.

Local colleges and universities should properly adjust and comprehensively optimize the curriculum of students with biology as their major in normal universities according to the current national educational policy, the change of teaching demand of basic education and the trend of reform. Through the setting and optimization of the curriculum, it is ensured that the students with biology as their major in normal universities can fully grasp the relevant knowledge of biology and pedagogy, and the theories and methods of educational psychology can be truly applied to the teaching of biology.

(2) Making efforts to expand practical teaching resources

We need to improve the practice and teaching mode, strengthen practice and volunteer teaching and other practice links; The construction of teaching staff, improve the professional quality and teaching ability of teachers need to be strengthened; We need to focus on exploring students' innovative spirit, teamwork consciousness and so on. Practical teaching activities need to be further enriched and expanded. We also need to carry out simulated teaching, public welfare publicity, social volunteer teaching and other activities, and comprehensively improve the teaching practical ability of students with biology as their major in normal universities.

(3) Strengthening the professional quality training of normal university students

Realistic and innovative professional quality is an important support for students with biology as their major in normal universities to successfully transition into qualified middle school teachers. In addition to inviting local primary and secondary school teachers and education experts to hold lectures or workshops, local colleges and universities should also pay close attention to the current national educational policy and the dynamics and trends of basic education reform, and integrate new teaching concepts and methods into the training process in a timely manner.

(4) Strengthening career planning and employment guidance for students with biology as their major in normal universities

Under the background of the new curriculum standards, students with biology as their major in normal universities need to carry out career planning and employment guidance earlier. And through career planning and employment guidance, they can make the necessary education preparation in time. At the same time, we should strengthen cooperation with secondary schools and educational institutions to create more internship opportunities and employment opportunities for normal university students, so as to help them make a smooth transition to the field of education^[3].

4.3 Adhering to practice-oriented teaching, strengthening scientific research training, and encouraging normal university students to participate in educational research and innovation

(1) Adhering to the practice teaching as the guidance, fully developing the practical ability of biology teachers

We need to appropriately improve and enhance the practical teaching equipment, places, conditions, increase the time and proportion of practical teaching, provide rich practical teaching resources, such as laboratories, teaching bases, etc. Teaching practice, education probation, teaching design and implementation and other forms of practical teaching activities need to be carried out, so that students can master teaching skills in practice, thus improving teaching effect.

(2) Strengthening scientific research training and practical teaching

We need to create conditions to attract normal university students to participate in teachers' scientific research, gradually penetrate scientific research awareness, and constantly improve their scientific research ability. Normal universities and colleges should be encouraged to cooperate with enterprises and scientific research institutions to enhance the combination of industry-university-research and application, so that students with biology as their major in normal universities can learn and master the

cutting-edge technology and application of biological science in practice, such as carrying out teaching practice activities on different topics, or cooperating with different types of schools to conduct educational internships.

(3) Strengthening the cooperation with middle schools to achieve the positive interaction between teaching research and middle school teaching

The positive interaction between the training and practice of normal university students can be achieved through middle school teachers entering colleges and universities and normal college students entering middle schools, so as to promote the improvement of normal college students' teaching practice ability [3].

(4) Using modern intelligent information means to improve the innovation ability of normal university students

Local colleges and universities should actively introduce and use modern technological means, such as virtual reality, online teaching platform, etc., to provide normal students with a more diversified teaching practice environment. In this way, we can stimulate their innovation consciousness, and cultivate their innovation ability, so as to meet the requirements of future education development.

(5) Strengthening individualized guidance and teach students according to their own aptitude

The tutorial system can be implemented in the training of students with biology as their major in normal universities, and professional tutors can be equipped for each student to provide personalized guidance and help. Tutors can adopt "one person, one program" to teach students according to their own aptitude, thus promoting the development of students' ability to personalize teaching practices.

(6) Promoting the deep integration of industry, university, research and application, and strengthening international exchanges and cooperation

We need to strengthen the cooperation between the university and enterprises and scientific research institutions, promote the deep integration of industry, university and research, and provide more practical opportunities and platforms for students with biology as their major in normal universities. Normal universities and colleges need to strive to open up international horizons, strengthen exchanges and cooperation with internationally renowned universities and educational institutions, learn, apply and transform their experience into good teaching concepts and methods, in order to improve the international competitiveness of students with biology as their major in normal universities.

4.4 Strengthening interdisciplinary integration education and comprehensive quality training

In order to cultivate the interdisciplinary ability of middle school students, students with biology as their major in normal universities should have the interdisciplinary comprehensive ability of knowledge crossing and thinking integration between disciplines, which can be improved through interdisciplinary teaching seminars and interdisciplinary teaching skills competitions. We need to strengthen the combination of liberal arts and science, improve the history, aesthetics, labor education and other qualities of those students, make good use of the excellent traditional Chinese culture, as well as cultivating the moral character of students' socialist core values, thus improving the cultivation of normal college students' comprehensive quality.

4.5 Enriching the practical teaching evaluation system, building a diversified evaluation system, and achieving effective feedback

(1) The continuous improvement of the evaluation system is conducive to the comprehensive, objective and accurate evaluation of students' teaching practice ability, so as to promote construction and reform by evaluation. Local colleges and universities should constantly explore and improve the evaluation system in line with their own characteristics and needs to improve the effectiveness of scientific evaluation.

(2) Normal universities need to create new evaluation methods to build a diversified evaluation system. In addition to the traditional written test and trial lecture, local colleges and universities can also combine modern educational technology means to enrich diversified evaluation methods, such as microteaching, teaching observation, teaching reflection, etc., in order to evaluate students' teaching practice ability more comprehensively. The system should cover teaching design evaluation, classroom teaching evaluation and other aspects, while introducing third-party evaluation at the same time.

(3) We need to strengthen the training and introduction of professional teachers, establish a team of teachers with both theoretical literacy and practical experience, and attach importance to personalized development. Teachers can participate in seminars and training courses in biology and pedagogy on a regular basis, so that they can adapt to the different teaching in the training process of students with biology as their major in normal universities under the new curriculum standards.

(4) Establishing a complete feedback mechanism. Local colleges and universities should formulate practical and feasible evaluation standards for practical teaching, and the feedback should be comprehensive and objective. At the same time, students should be able to understand their own evaluation results and improvement directions in time, and effectively improve their teaching practice ability. Diversified feedback methods are introduced to obtain more comprehensive feedback information from different angles, and feedback can be provided through group discussion and individual guidance [4].

5. Conclusion

Under the continuous reform of the basic education curriculum, how to ensure that the future middle school biology teachers trained can adapt to and be competent for the teaching tasks under the new curriculum standards and dare to face the teaching difficulties under the new curriculum standards and new situations is very important. Local colleges and universities should strengthen the top-level design of the practical ability training of normal university students, focus on the long-term development of students with biology as their major in normal universities, optimize the practical environment and create practical conditions. These universities need to break the shackles that are not conducive to the cultivation of students with biology as their major in normal universities, mobilize all effective forces such as schools, teachers, society and students, explore effective paths for practical teaching, pay attention to teaching management. We also need to strengthen assessment, further improve the fair, scientific and effective practical teaching evaluation system, and make the cultivation of students with biology as their major in normal universities closer to the direction of "excellent teachers".

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References

- [1] *Biology Curriculum Standards for Compulsory Education (2022 edition)*. Formulated by the Ministry of Education of the People's Republic of China, Beijing Normal University Press, 2022
- [2] Chen Xiaojun et al. *Integration and reconstruction: Reflection on teacher education curriculum based on practice-orientation*. *China Electric Power Education*, 2012 (07): 32-36
- [3] Lu Yunfeng et al. *Discussion on the cultivation mode of biology major normal University students under the new situation—taking local normal colleges as an example*. *Survey of Education*, 2016, 5 (5): 52-53
- [4] Ma Li et al. *Discussion on the "Trinity" practical teaching model of biological science teacher major in local universities—A case study of Shangqiu Normal University*. *Modern Horticulture*, 2012, 23: 90-192