A Preliminary Study on the Classroom Teaching Skills Training Strategies of Normal Students in Science Education——Take the Course "Teaching Design of Primary Science Curriculum" as an Example

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Abstract: The curriculum reform in 2022 puts forward new requirements for the professional literacy cultivation of primary science teachers, and the cultivation of primary science classroom teaching skills is an important aspect of the professional literacy cultivation of science education teachers, mainly including subject knowledge and teaching theory, teaching design and preparation, teaching methods and strategies. On the basis of following the principle of combining theory and practice, diversified teaching and student subjectivity, the training strategies of group cooperative learning, observing the teaching process of excellent teachers, and strengthening the effect of micro-grid teaching are proposed, and in addition to the expected evaluation, it provides a certain theoretical basis for the cultivation of normal students in science education.

Keywords: Science Education; Teacher Training Students; Classroom Teaching Skills

Introduction

In 2022, the "Science Curriculum Standards for Compulsory Education (2022 Edition)" (hereinafter referred to as the "course standard") was officially promulgated, the curriculum standard further strengthened the educational orientation of the primary school science curriculum, and the core literacy that this course should focus on cultivating (including: the four dimensions of scientific concept, scientific thinking, inquiry practice, and attitude responsibility)[1], a new round of curriculum reform and the promulgation of the curriculum standard, put forward higher professional requirements for primary school science teachers. As the future primary school science teacher, the professional training of science education teachers is urgent, and the cultivation of primary science classroom teaching skills is an important aspect of the professional quality cultivation of science education teachers.

1. Overview of teaching skills in primary school science classrooms

Different literature has different understandings and scope of classroom teaching skills, and the primary school science classroom teaching skills mentioned by the author refer to the subject knowledge and teaching theory, teaching design and preparation, teaching methods and strategies that teachers have in the field of primary science education.

1.1 Subject knowledge and teaching theory

Primary school science teachers need to master the knowledge system of primary science subjects, understand the cutting-edge dynamics of subject development and relevant theories of educational reform. They should have a deep understanding of teaching content, teaching materials and teaching standards so that they can rationally design teaching activities and evaluate student learning outcomes. The specific subject knowledge of primary science can be divided into 13 core concepts, and teaching theories include project-based learning inquiry mode, problem-solving inquiry mode, and related education and teaching theory.

1.2 Instructional design and preparation

Teachers need to have good instructional design and preparation skills. They should set clear teaching objectives, design inspiring teaching activities, and select and prepare relevant teaching resources and teaching aids according to the characteristics of students and subject requirements.

1.3 Teaching methods and strategies

Teachers should master a variety of teaching methods and strategies suitable for primary science education. For example, heuristic teaching, inquiry-based learning, case studies, discussions, and cooperative learning stimulate students' interest in learning, develop their thinking skills and problem-solving skills.

2. Principles for the development of teaching skills in primary school science classrooms

2.1 The principle of combining theory and practice

Combining teaching theory with practical teaching practice, through the theoretical guidance of pedagogy, psychology and science pedagogy, teacher training students can understand and apply the basic principles of science education, and can flexibly apply them in practical teaching.

In the teaching process of the course "Primary Science Classroom Teaching Design", explain the primary school science classroom introduction skills, primary school science classroom explanation skills, primary school science classroom demonstration skills, etc. In the process of explaining theoretical knowledge, students need to understand specific skills and master specific effective development strategies. Therefore, it is necessary to strengthen students' skill mastery through the practice of teaching skills, and carry out practical skills training in the form of classroom demonstrations.

2.2 Diversified teaching principles

Use a variety of teaching methods and strategies to meet students' different learning needs and individual differences. For example, group cooperative learning, problem-oriented learning, case analysis, etc. are used to stimulate students' thinking ability and creativity, and cultivate their critical thinking and problem-solving skills.

2.3 The principle of student agency

Focus on cultivating students' subjectivity and independent learning ability. Through instructional design and organization, teacher training students should encourage students to actively participate in classroom discussions, experimental operations and scientific inquiry to stimulate students' interest and initiative in learning.

In the process of classroom teaching, make full use of information means, such as rain classroom, superstar learning pass, etc., to give full play to students' subjectivity and independent learning ability in the classroom. For example, in the teaching process of "Teaching Design of Primary Science Curriculum", learning tasks are released before class, and classroom presentations and reports are carried out in the form of flipped classrooms.

3. Strategies for developing teaching skills in primary school science classrooms

3.1 Group cooperative learning

Teacher training students are encouraged to use group cooperative learning to teach. Through group work, students can discuss with each other, work together to solve problems, and increase interactivity and engagement. Teacher training students can design teaching activities suitable for group learning to develop students' teamwork and communication skills.

Based on the principle of student body and diversified teaching, teaching is carried out in the form of group cooperation in classroom teaching. For example, in the process of explaining the skills of introducing science in elementary school classrooms, students are required to teach the "food chain" part of the content in the classroom. The activity design of the introduction part can be carried out in the form of group cooperation, and the design and display of the introduction part can be carried out through this group lesson preparation method, and the teamwork and communication skills of students can be comprehensively cultivated.

3.2 Observe the teaching process of excellent teachers

Teacher training students can actively observe and learn from the teaching practices of excellent science teachers. They can participate in internships or volunteer activities to observe and draw on their classroom teaching methods, teaching techniques and the use of teaching resources.

According to the principle of diversified teaching, while learning theoretical knowledge, students should also use case analysis and learning methods to observe the teaching process of excellent teachers, make good listening notes in the process of observation, sort out the ideas of the overall curriculum design, summarize how excellent teachers display relevant teaching skills in the teaching process, and find that further improvement can be made in the process. For example, in the video case of observing and learning "The Law of Moon Phase Change", the teacher in the video can be summarized, fully considering the characteristics of students in the process of asking questions and answering, playing a very good role in inspiration and guidance, and in the process of experimental demonstration, the process method is mainly demonstrated, rather than the entire experimental process, giving students sufficient space for thinking and design.

3.3 Strengthen the effect of micro-grid teaching

According to the principle of combining theory and practice and group cooperative learning, the effect of micro-grid teaching can be strengthened. Micro-grid teaching is one of the most effective ways to improve the teaching skills of normal students, and it is also an indispensable course for normal students to formally enter the teaching profession, which helps normal students master the basic teaching process, basic skills, teaching analysis and teaching plan writing and other necessary skills of teachers.[2] Teacher training students should cultivate the habit of reflection and self-evaluation. In teaching practice, reflect on your teaching effect in time, think about your strengths and weaknesses, and look for ways to improve. The teaching process and teaching perception can be recorded, and regular self-assessment can be carried out.

The specific teaching content of the course "Teaching Design of Primary School Science Curriculum" includes the theoretical part and the practical training part, and the practical training part mainly considers the form of micro-grid teaching, and the micro-grid practical training in the form of group cooperation. In order to better strengthen the teaching effect of micro-grid teaching, you can also try to hire front-line teachers in primary and secondary schools as instructors.

4. Expected evaluation

In order to better achieve the training goal of classroom teaching skills training for normal students majoring in science education, mainly in the training process, the feedback and evaluation of the overall training effect is carried out by using the classroom teaching ability evaluation system of normal students, mainly from several indicators such as teaching objectives, teaching content, teaching process, teaching innovation, and teacher quality [3].

The teaching objectives clarify the learning effects that students need to achieve in the teaching process, so in the process of formulating teaching objectives, it is necessary to emphasize the main position of students, and at the same time the content of teaching objectives needs to be specific and accurate. The design of teaching content should fully consider the theoretical knowledge and practical ability lacking in science education teachers. In the teaching process, it is necessary to fully consider whether the major and difficult points are properly grasped, whether the teaching methods adopted are appropriate, and whether diversified teaching methods are adopted. In terms of teaching innovation, teachers should handle teaching materials and integrate information teaching skills into the teaching process. Finally, the quality of teachers comprehensively evaluates the professional quality of teachers. According to the above indicators, the effect of skill training is evaluated.

5. Conclusion

Relying on the course "Teaching Design of Primary School Science Curriculum" offered by normal students majoring in science education, this paper explores the classroom teaching skills training strategies of normal students majoring in science education, and discusses specific topics from three aspects: specific training principles, training strategies and evaluation methods of expected evaluation, which has certain guiding significance and value for the cultivation of normal students majoring in science education in colleges and universities.

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