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Primary School Information Technology Teaching Practice and Thinking Towards Computational Thinking

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Abstract: Under the background of the rapid development of educational informatization, the training of computational thinking has become a crucial goal in primary school information technology teaching. Computational thinking is not limited only to the traditional logical reasoning and problem-solving ability, but also covers a wider range of thinking fields, including abstract thinking, systematic thinking, and innovative thinking [1]. The training of computational thinking can help students to conduct effective logical reasoning in the face of complex problems, to find the best way to solve problems. At the same time, students are encouraged to jump out of the traditional thinking frame when facing problems and propose novel and unique solutions to effectively cultivate their creativity and innovation ability, to enable students to better adapt to the needs of future social development and improve their comprehensive competitiveness in various fields. In this regard, this paper first clarifies the training principles of students' computational thinking in information technology teaching in primary schools, and then puts forward effective training countermeasures, to provide some references for relevant researchers.

Keywords: Computational thinking; Cultivation; Primary school information technology; Teaching

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1. Introduction

At present, with the proposed and steady advancement of education reform, the reform and innovation of information technology teaching in primary schools is critical. In order to cultivate students' computational thinking more effectively, teachers need to carefully design a series of teaching activities that meet students' cognitive characteristics and learning needs, and ensure that these activities can not only stimulate students' interest in learning, but also help them gradually develop computational thinking abilities such as logical thinking, problem solving and innovative thinking in practical operation. In this way, teachers can carry out information technology teaching based on computational thinking, so that students can deeply understand the connotation of information technology curriculum knowledge in a relaxed and happy learning atmosphere, and

can flexibly use this knowledge, laying a solid foundation for their follow-up study and life, and promoting their sustainable development.

2. The training principles of students' computational thinking in primary school information technology teaching

2.1. The principle of practicality

In the teaching of information technology in primary schools, problem-solving ability is an important indicator to measure computational thinking. Therefore, teachers should be good at creating problem situations or arranging a lot of practical activities in combination with the teaching content, so that students can continuously improve their problem-solving ability in the actual operation [2]. If students can flexibly apply what they have learned in the process of problem solving, they can not only internalize the theoretical knowledge they have learned, but also accumulate richer practical experience. They can better apply what they have learned to solve practical problems in future study and life, and promote their computational thinking to be further improved.

2.2. Guiding principle

Primary school students are still young, have relatively less social experience, and their way of thinking has certain limitations. In order to improve the training effect of computational thinking, teachers should always adhere to the guiding principle in the teaching of information technology [3]. For example, when students encounter difficulties or need help, teachers should play a good role as guides, think with students, and find ways to solve problems. In this way, students' thinking mode can be perfected, and their computational thinking ability can be continuously strengthened.

2.3. Principle of subjectivity

In the training of computational thinking, teachers should emphasize students' subjectivity and implement the teaching idea of "student-oriented," which requires teachers to adhere to the principle of subjectivity in information technology teaching. Specifically, teachers should deeply understand and master the actual needs of students in each learning stage, and gradually establish the concept of student-oriented education. At the same time, teachers also need to pay full attention to the development of students, and actively understand the characteristics of students' computational thinking, work out more appropriate information technology teaching programs, and ensure that all teaching activities are carried out around the actual needs of students [4].

3. Training countermeasures of computational thinking in primary school information technology teaching

3.1. Close contact with real life arouses students' interest in learning

In real life, information technology is everywhere. Teachers take the initiative to contact real life to carry out information technology teaching, and give play to their guiding role in classroom teaching, which can help students have a deeper understanding of information technology knowledge and effectively promote the development of students. Therefore, in the actual teaching process, teachers can show students the specific application of information technology in real life, so as to make them have a strong interest in information technology learning, and can also have a cognition and understanding of the specific scenes of information

technology [5]. For example, when teaching "Experience Human-Computer Interaction," teachers can closely connect with real life, create a virtual shopping interaction system combined with teaching content and objectives, and simulate the most realistic shopping situation. Students can play various roles in the virtual shopping interaction system, and can carry out a shopping experience in the virtual space, and experience various human-computer interaction scenes. At the same time, when students encounter technical failures in the virtual shopping interactive system, they will actively use the knowledge they have mastered to think about how to solve these failures or seek help from teachers and professionals. In addition, teachers can also guide students to think about how to improve and optimize the virtual shopping interactive system, such as what functions can be added to make the shopping experience more convenient and how to improve the user friendliness of the interface. In addition, the close combination of real life and information technology knowledge can not only effectively activate students' desire to explore, but also make them more intuitive to feel the principle of human-computer interaction, but also deepen the understanding and mastery of the teaching content of this section through personal practice, and develop students' computational thinking ability in the process of problem solving [6].

3.2. Introduce project-based learning to enhance problem-solving ability

Information science and technology courses not only have strong practicality, but also the speed of knowledge update is relatively fast. In this regard, teachers should make full use of the teaching form of project-based learning, so as to fully develop students' potential and improve their problem-solving ability, which is also an effective means to improve students' computational thinking. At the same time, teachers can also rely on project tasks to divide teaching activities into several links, guide students to think deeply about information technology knowledge, and complete project tasks in small groups, improve their problem-solving ability, and lay a solid foundation for improving the quality of computational thinking training [7]. For example, when teaching "Beautifying Pictures," teachers can design the following project tasks: take relevant photos for campus activities, and use image processing software to beautify these photos, such as adding special effects, cutting composition, and adjusting colors. In the process of completing the project tasks, students can not only master image processing skills but also understand the importance of image beautification processing in different scenes. For example, when students provide pictures for school news reports, they will ensure that the colors are natural and the pictures are clear, and they can accurately convey relevant information with the help of pictures. In addition, in project-based learning, teachers break through the role of knowledge transmitter, give full play to their guiding role, and actively encourage students to explore independently, ask questions, and find solutions together in group cooperation. In this way, students can learn how to analyze problems, design project solutions, and effectively complete project tasks with the information technology knowledge they have mastered. In this process, they can naturally improve their information technology literacy and computational thinking ability, and effectively enhance students' teamwork spirit and innovation ability [8].

3.3. Focus on strengthening practical teaching and training students' thinking ability

In the teaching of information technology, the generation and development of computational thinking are based on practice, and it is far from enough to rely solely on theoretical teaching. Teachers need to gradually strengthen practical teaching, so that students can accumulate rich practical experience from IT, and improve students' understanding of information technology knowledge through the process of "finding problems - abstract generalization - modeling operations - solving problems." Continue to strengthen their practical operation ability and problem-solving ability, and then form superior computational thinking. In the process of strengthening

practical teaching, teachers should give priority to students' independent practice, and provide necessary guidance and inspiration by themselves. They can also sort out problems in independent practice into teaching resources to gradually improve students' thinking ability [9]. At the same time, teachers should also actively organize students to think about whether the problem is reasonably solved, whether the method of solving the problem can be further optimized, and explore whether other methods can be used to solve the problem to promote the in-depth development of students' computational thinking. For example, when teaching "Making Digital Tabloids," teachers can first let students understand the basic concept and production process of digital tabloids, and then let them design and make them themselves. In this process, students need to apply their theoretical knowledge and operational skills, such as text editing and picture processing, and think about how to organize information in a way that is both beautiful and practical. In the process of independent practice, teachers can observe what links students encounter difficulties in and give timely guidance. For example, if students encounter problems in typographic design, teachers can guide students to think about how to improve visual effects by adjusting font size, color contrast, layout, etc. Through such practical activities, students can not only exercise their computational thinking, but also improve their ability to solve practical problems, thus effectively enhancing their comprehensive literacy [10].

3.4. Enrich classroom teaching resources to meet students' inquiry needs

In the teaching of information technology in primary schools, in order to fully satisfy students' inquiry needs, teachers should not only make full use of existing teaching resources, but also actively develop and use excellent resources outside the classroom, so as to avoid teaching falling into the dilemma of lack of resources and effectively broaden students' professional vision. In the process of developing and applying teaching resources, teachers should ensure that the selected resources are consistent with students' age characteristics and teaching content, effectively expand students' way of thinking, improve students' computational thinking in multiple dimensions, and ensure that they can achieve better learning results and achieve the expected learning goals [11]. For example, when teaching "Cognitive Digital Works", teachers can introduce multimedia teaching software so that students can learn the creative process of digital works interactively. Through the software, students can not only visually see the production steps of digital works, but also operate them themselves and experience the creation process from scratch. Such teaching resources can not only stimulate students' interest in learning but also help them understand abstract computing concepts such as algorithms and programming logic. In addition, teachers can make use of online platforms, such as the Programming Education website, to provide students with additional learning materials and programming challenges, encourage students to continue exploring and practicing outside of class time, encourage them to continue to develop their computational thinking outside of the classroom, and at the same time, teachers can understand their learning progress and difficulties through online platforms. In order to provide them with targeted instruction. In this way, by constantly enriching and optimizing information technology teaching resources, teachers can provide students with a comprehensive, interactive, and challenging learning environment and promote their comprehensive development of computational thinking [12].

3.5. Pay attention to the summary and reflection, and promote the training of computational thinking

In the direction of computational thinking, after the teaching of information technology, teachers should pay enough attention to the sharing and communication of students, leave enough time for students to display

and share their works, actively encourage other students to comment, and ensure that they clearly identify the shortcomings and references of their works in the process of mutual comment and work sharing. Make clear the distance between themselves and other students, make continuous efforts in the direction of their improvement, constantly improve their computational thinking, promote the improvement of information technology learning ability and application ability in self-reflection and summary, form a good habit of independent reflection, and then escort students to achieve personalized development [13]. For example, when teaching "Sharing Learning Resources," students can share how they collect and screen information resources, as well as the problems and solutions encountered in the process of resource sorting and classification. Such sharing not only helps students realize the importance of information resources but also stimulates them to think deeply about information technology. In addition, teachers can also guide students to self-reflection and encourage them to think about which methods are effective and which need improvement in the learning process. Through regular self-reflection, students can better understand their learning habits and thinking patterns, and thus improve their learning purpose and efficiency. In addition, based on students' self-evaluation and mutual evaluation, teachers should conduct a comprehensive evaluation on students based on their performance in class and works, and give targeted suggestions, to better promote the full penetration of computational thinking training in information technology teaching and further promote the rapid improvement of students' computational thinking ability, learning and application ability. To promote the comprehensive development of students' abilities [14].

4. Conclusion

All in all, under the current educational background, cultivating students' computational thinking has become an important orientation of information technology teaching in primary schools [15]. Therefore, teachers should constantly study the teaching methods, innovate and optimize the current teaching methods, such as the implementation of close contact with real life, mobilize students' interest in learning; Introduce project-based learning to enhance problem solving ability; Focus on strengthening practical teaching to exercise students' thinking ability; Enrich classroom teaching resources to meet students' inquiry needs; Pay attention to summary and reflection, promote the training of computational thinking and other countermeasures, so as to effectively develop students' computational thinking, continuously consolidate their comprehensive literacy, and continuously improve the effectiveness of information technology teaching.

Disclosure statement

The author declares no conflict of interest.

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