Reflection on Classroom Teaching Method of Scratch Programming
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Abstract. With the continuous infiltration of artificial intelligence into people's lives, programs as the core soul of artificial intelligence, programming education is becoming more and more popular. Compared with adult programming, Scratch programming has great advantages in interest and application. At the same time, it also plays a positive role in cultivating students' creative ability and practical ability. In this paper, we get rid of the traditional canard teaching mode, take the cognitive psychology as the guidance, combine the concrete Scratch programming class case, discuss the application effect of the task-driven method in the Scratch teaching, and discuss the application effect of the task-driven method in the Scratch teaching. From pre-mission preparation-presenting tasks-analyzing tasks-participating in tasks-the participation of students in the whole learning process is strengthened in several aspects of the evaluation task. Finally, some suggestions are given for the problems arising in the application of the task-driven approach in the classroom.

Keywords: artificial intelligence; Scratch; Scratch programming; programming education.

1. Introduction

Scratch is a programming language designed and developed by the famous Massachusetts Institute of Technology in the United States, and it is suitable for children from 6 to 12 years old to learn and operate. The interesting and easy-to-operate of scratch solves many adult programming problems easily like Monotonous picture, logical abstraction, and so on. So, it has been widely promoted in many schools and institutions. Scratch aims to develop children's logical thinking, imagination, problem-solving ability [1], but in the traditional classroom teachers are used to cover most of the class, and the teaching method used by teachers also has some limitations, and it is difficult to continuously arouse students' interest and attention, which leads to the lack of students' sense of participation. A programming class that should be lively will therefore become a teacher-led injection-oriented teaching. In this regard, some people put forward the task-driven teaching method, teachers are the main guide in the whole teaching process, the complete teaching content is divided into a number of practical goals, students occupy the main position, they complete each task from the surface to the inside and from the shallow to the deep, finally achieve the purpose of mastering the teaching content.

2. The Theoretical Basis of Task-driven Method

The task-driven method is based on constructivism. After the teacher decomposes the teaching content into tasks, the students carry out autonomous learning and cooperative learning around the task, and finally, on the basis of completing all the tasks, the students' abilities of think and solve problems independently are improved. Compared with the traditional teaching method, the task-driven method first changes the position of the teacher, the teacher changes from the teacher of knowledge to the guide of knowledge, and secondly, the students no longer have to be forced to accept knowledge, but to participate in the whole teaching process actively, which aroused their desire for knowledge in a large extent. In a task-driven teaching class, students' study with tasks and teachers propose the targeted guidance, students can get a sense of success in the process of achieving the goal, which not only arouses their emotions, but also improves their consciousness of exploration.

Constructivism, which focuses on learning, attaches importance to the position of students. It emphasizes that students should be encouraged to play their creative spirit in the process of learning, so that they can externalize their knowledge and realize self-feedback in various situations. According
to the teaching contents and the students' learning characteristics, the teachers have carefully designed
the teaching tasks to provide the best task situation for the students, so that the students can get rid of
the boring language content and accomplish the fixed tasks in a targeted way. In the process of
completing the task, teachers are not only to responsible for designing and formulating the task, but
also need to integrate some theoretical knowledge, such as concepts, principles, etc.

In addition, constructivist theory holds that cooperative learning also plays an indispensable role
in constructivism, which affects students' understanding of learning content. Under the arrangement
of teachers' inspiration, students set up a study group and exchange inquiry, they understand and
implement the task, put forward their own insights and arguments, and analyze and evaluate the views
of other members of the learning group. By creating such a positive cooperative learning atmosphere,
students and teachers share their own views and wisdom in solving the problems, which not only
completes the learning task, but also realizes the assimilation and adaptation of knowledge.

3. Implementation of Task-driven Approach in Classroom

In Hangzhou, Shanghai and many other areas, Scratch programming has been included in
information technology textbooks, as a compulsory course in primary schools. However, in many
central cities, the development of IT curriculum lags behind, some schools can only carry out
diversified learning in the form of associations. The class case of this paper comes from a Scratch
course of programming association class in a primary school in Zhengzhou. There are 20 students in
the class, and the students are distributed from the second grade to the fourth grade. The case of this
paper will also be based on the task-driven teaching model one by one.

(I) Identification of themes. The brush module in Scratch can not only draw some simple characters,
but also record the trajectory of objects, which plays a very important role in programming. In the
previous nine lessons, students have learned about the overall interface of Scratch, some common
building block functions, and some simple Mini Game. In the first two lessons of this lesson, the
brush tool is preliminarily learned to realize the effect of mouse controlling the brush drawing, and
this lesson is to connect the brush knowledge with the mathematics knowledge, so that the brush can
draw all kinds of regular polygons.

(II) pre-class preparation. The cognitive characteristics of learners have a certain impact on their
knowledge acquisition process. Therefore, the promotion of programming education in primary
school must be combined with the level of cognitive development of students. [2] so at the beginning
of this class, in order to attract students' interest, and to expand the theme of this lesson-regular
polygons, the instructor will prepare videos of various graphic transformations made through Scratch.
In addition, teachers also need to make adequate group preparation, due to the uneven distribution
of the age of students in the programming community class, teachers need to refer to a variety of factors,
such as students' grades, past performance, operational skills, and so on, groups. The number is
limited to 4 / 5.

(III) presentation of mandates. In the teaching process of Scratch programming, the task design is
very important, which directly affects the students' participation and the subsequent teaching results.
Therefore, it is very important to make the right task. First of all, the task should be clear. On the
premise of summarizing the teaching contents, teachers should divide the total teaching task into
several small goals that can be achieved gradually and gradually, and finally realize the complete
teaching task by completing each task of subdivision. Second, the task should be practical, students
of different ages also have great differences in accepting knowledge, teachers should fully consider
the actual situation of the students before formulating the task, aiming at the different stages. Twenty-
five percent of the students designed tasks that fit the characteristics of the students. The final task
has to be progressive. First, make a simple task, step by step, from simplicity to complexity, from
easy to difficult, teachers still need to grasp the order of important and difficult points, not too
concentrated. Enable students to achieve a successful experience in the process of problem solving.

(IV) Analytical tasks. The first task of teacher design is discussion task, which is based on students'
cognitive psychology. It is convenient for students to establish an intuitive and perceptual
understanding of graphics and to understand the basic composition of graphics. Task two and task three are operational tasks, which require students to operate on the computer themselves. Students encounter problems in the process of practice, through teacher-led, group interaction, grasp the use of brush drawing triangle method. Task 4 is a hybrid task, which includes discussing inquiry tasks, finding out the relationship between the rotation angle and the number of rotation edges and regular polygons through student observation and group discussion and reasoning, and also including verification tasks. The pattern that students will discover Verify in Scratch to see if the rules are correct. Task 5 is a divergent task. According to the first four tasks, students make full use of their fantasies and rotate the polygons to create more beautiful patterns. The progressive progress of the above five tasks, from simplicity to expansion, not only helps students to understand the characteristics of each graph, but also improves their hands-on ability and spatial imagination.

(v) participation in the mandate. Through comparative analysis and group discussion, the students found that each edge of a regular polygon is equal and each inner angle is equal. The instructor also provides students with the inner angle and knowledge of regular polygons for subsequent on-line operation. Students draw out squares and triangles in turn according to the order of tasks. The teacher guides the students in the process of operation and practice, and gives appropriate help and encouragement. Before starting task 4, the teacher guides the students to think independently, try to summarize the rules of drawing regular polygons, and then work together in groups to explore the rules obtained by statistics, and then verify them separately. Complete a series of tasks through student leadership Can enhance their sense of participation.

4. The Superiority of Task Driving Method in Scratch Classroom Teaching

The traditional teaching methods of information technology are in the position of passive acceptance of knowledge by the middle school students. If the teacher teaches one step, the students will follow the operation that the teacher says, and the students will always follow the rhythm of the teacher. The result is that all students' works are almost the same and lack of novelty. Compared with the traditional teaching method, the task-driven method first changes the position of the teacher, the teacher changes from the teacher of knowledge to the guide of knowledge, and secondly, the students no longer have to be forced to accept knowledge. But actively participate in the whole teaching process, which to a large extent aroused their desire for knowledge. In this process, the teacher's function looks at in the process, students also learn to use dialectical vision to acquire new knowledge and understand that there is more than one solution to the problem. In such a teaching environment, they can not only think independently. Can also cooperate the exchange, the knowledge meaning construction also leaps on the paper [3].

Under the task-driven teaching method, teachers assign tasks to students and teach them some common concepts, such as the inner angle and knowledge of regular polygons, which invisibly foster their understanding of computing concepts. In designing tasks, teachers will create appropriate and interesting problem situations for each task, so as to attract students' interest. In the process of learning, they will link the situation to life and promote their emotional input in learning. This is conducive to the realization of the practical objectives of the calculation. In addition, teachers learn to "let go" in class, leaving more room for students to learn by themselves. And cooperative learning, not only accomplishes the task, but also obtains the knowledge transfer, gradually forms the good thinking habit in the classroom, discovers, the analysis and the solution problem ability also obtains the gradual improvement, this is the student computation idea formation. All these concepts, practices and concepts constitute computational thinking. What is most needed in information technology class is the cultivation of students' computational thinking.

Under the task-driven approach, learner-centered is emphasized, but the guidance of teachers should not be ignored. Students are active constructors of knowledge meaning, and teachers are responsible for organizing and guiding the whole teaching process. According to the teaching contents and the students' learning characteristics, the teachers have carefully designed the teaching tasks to provide the best task situation for the students, so that the students can get rid of the boring
language content and accomplish the fixed tasks in a targeted way. In the process of completing the task, the teacher is not only responsible for the design and formulation of the task, but also needs to integrate some theoretical knowledge, such as concepts, principles, etc. So compared to the traditional classroom, although teachers are no longer the instigators of knowledge, the preparation and organization before class require more careful planning and arrangement.

5. The Problems that Should be Paid Attention to in the Classroom under the Task-driven Approach

5.1 Pay Attention to the Integration of Subjects

As a part of information technology, programming should not be isolated and can be connected with many subjects. Therefore, teachers should pay attention to the cross-integration of programming and other disciplines in teaching. For example, in this case, the combination of programming and geometry knowledge in mathematics, it not only improves the thinking ability, but also reviews some mathematical knowledge, so that students can also experience the beauty of graphics and geometry in the programming class. Wherefore, when designing tasks, teachers can pay close attention to the relationship between other subjects and the knowledge points of the task, and enhance the teaching effect and complete the teaching tasks. This lesson is between classes There are still some deficiencies in the integration of regular polygons, which cannot effectively balance the relationship between the interesting and deep curriculum and the students' mastery of knowledge, and the related content of regular polygons is junior high school mathematics knowledge, which can only be expanded here. Rather than consolidating the knowledge that has been learned.

5.2 Pay Attention to the Reform of Evaluation Mode

In the traditional class, the teaching effect evaluation is usually the last part of the class process. However, in the task-driven approach, the evaluation can run through the process of the whole task implementation, and the teacher can make an appropriate evaluation every time when a task is completed, but the evaluation here may just only need a brief few words. The valuable evaluation is not only the recognition of the students' learning activities, but also the reasonable appreciation of the teachers' task. In addition, the evaluation of the students can be further refined, such as the evaluation of the base areas of the students in the group, the evaluation of the performance of the students themselves and the evaluation of the whole state of the teacher's completion of the task. The evaluation of teachers mainly includes: the reasonable degree of group assignment; the scientific degree of task division; the degree of interest; the degree of fluency of task cohesion; the satisfaction degree of task completion effect. The evaluation of students mainly includes: students' attitude towards the task; participation in the task; completion degree of the task.

6. Conclusion

A dynamic classroom needs a lot of parts together. It needs not only teachers' careful teaching design, reasonable teaching methods, but also students' input and cooperation, as well as an equal and comfortable teaching environment. Under the task-driven teaching model, the success or failure of a class is influenced by many factors, and teachers' preparation, design and cohesion occupy a large proportion. The task of teachers is to create a good teaching situation for the acquisition of students' knowledge, to design and formulate effective teaching tasks, and to guide and inspire students to acquire new knowledge. Students occupy the dominant position; innovation ability and problem-solving ability are constantly raised with the completion of the task, and at last in the process of meaning construction to achieve creation. Teachers and students cooperate with each other to promote the task, the classroom teaching efficiency and cohesion will also be significantly improved [4].

The core idea of Scratch programming is imagination, creation and sharing. Teachers should also permeate and convey these ideas in the process of teaching, grasp the students' ideas in a timely manner. It is the responsibility of every Scratch programming teacher that not only to let their creation
contain rich imagination, but also to share the creative expression of the work. In Scratch programming teaching, “The basics are learning, the emphasis is on doing “is particularly important [5]. As teachers, we always try to cultivate our children as small creators, encouraging them to use their imagination to create some works, but the easiest thing to ignore is to encourage them to "do it." not to "fantasy". By using the task-driven approach, students have completed practical tasks, and their ability to solve problems has not only been effectively exercised, but also developed their sense of independent inquiry and teamwork. It is true that discovering problems and solving problems is one of the sources of learning knowledge, but we must not be limited to formalism. In the process of discovering problems and solving problems, we should emphasize the cultivation of students' personality, which should also be the direction we should strive for in the next step.

References


