Explore the Realization of Teaching Animation in Primary School Science Curriculums

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Abstract: With the rapid advancement of information technology, various information teaching methods have become commonplace in the educational field, but the teaching methods are rarely used in primary school science curriculums. This article explores the realization of teaching animation in the primary school science curriculum. Moreover, through a specific example --"the law of moon phase change" introducing teaching animation into primary school science classrooms can better improve students' learning quality, attract students' classroom attention, and better enrich the teaching resources of science courses.
Keywords: Teaching animation; Primary school science; Moon phases

1. Introduction

With the advancement of information technology and the animation industry, many teachers have begun to use digital teaching information to assist in teaching. However, most domestic educational animations are applied to school subjects such as Chinese, Mathematics, and English, but few educational animation resources are applied to science subjects [1]. And few teachers have taken the initiative to develop and use them, resulting in some abstract knowledge not being intuitive presented to students. Nowadays, more and more countries have begun to pay attention to science education, and how to teach science classes more effectively and improve the teaching effect and education quality of science classes has become a concern.

As a product of the contemporary high-speed information era, teaching animation is one of the digital teaching resources. The uninteresting theoretical knowledge in the book is delivered to the students through each frame of animation, which may not only visualize the abstract knowledge but also offer teachers a variety of teaching approaches. This article chooses the Animate Software to achieve the application of teaching animation in primary school science courses. Based on the original version of Flash, animate software adds several additional functions. Through ActionScript3.0 can realize the interactive teaching animations, which is helpful for science teachers to show the instructional animations to the students.

2. The current situation of teaching science classes in elementary school

In the face of a world full of unknowns, students investigate 100,000 whys via science and technology education, and universities, middle and elementary schools have become "incubators" for leading and growing science and technology. However, some schoolteachers focus solely on books and neglect to use the teaching tools and materials. Teachers should continually innovate teaching methods and enrich the teaching content to improve the effectiveness of science courses and raise students' interest in scientific knowledge [2].

Nowadays, there are still some problems in primary school science courses, such as limited curriculum resources, single teaching methods, and a lack of the dominance of students [3]. As a new form of teaching, teaching animation can enrich the primary school science curriculum resources, and interactive animation can also allow students to participate in teaching, highlighting the dominant position of students.

3. The realization method of teaching animation

3.1 Teaching analysis

Before making teaching animation, the most important thing is to carry out a teaching analysis. Teaching analysis includes studying situation analysis, textbook analysis, the teaching content, the teaching objectives, teaching focus, and difficulties. In the Primary Science course, each grade and semester's textbooks are distinct, and the knowledge and teaching difficulties of each class are also different, so the content of teaching animation is different. After the teachers select the course, it is necessary to analyze the textbooks in detail. First, the teachers need to determine what grade the lesson is for, what the students' characteristics are, and at what basic knowledge level they have mastered. Secondly, they need to set the teaching objectives from three aspects: scientific inquiry, scientific knowledge, emotional attitude, and values. Finally, they should determine the key points and difficulties of this lesson.

3.2 Script Design

Script design is a vital step in animation production. In short, designing an animation script is writing a script. We must first

determine the contents, key points, and difficulties of the lesson's knowledge before writing the script. The animation script is not the same as the live-action script. It contains certain factors, including the characters, language, and actions. And it is necessary to explain what a character in a scene did and said in the animation screenplay. For example, in the law of moon phase change lesson, we must explain how the moon changes under various circumstances at different times, and the unique change laws. And it is also necessary to determine how many seconds each action and scene occurs when writing the script.
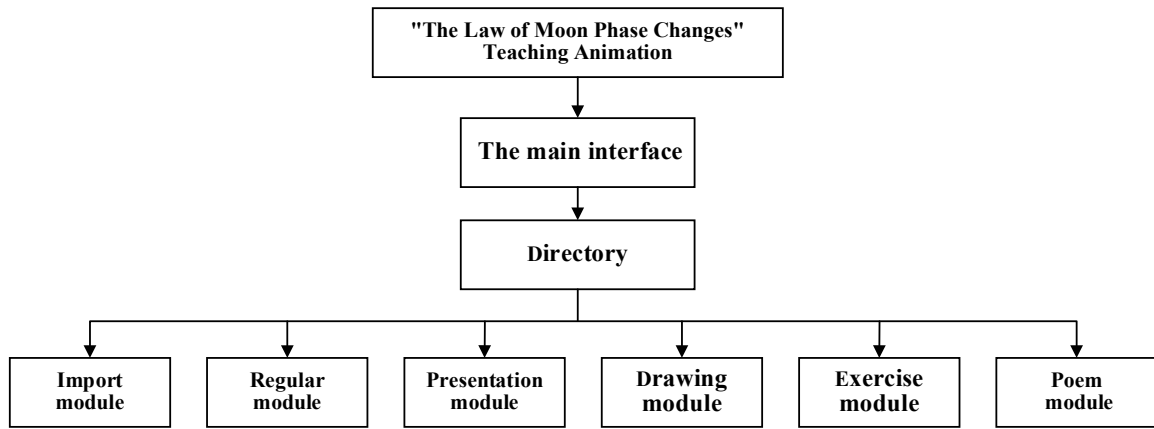
4. The development example of teaching animation

Fig. 1   Structure of the teaching animation "The law of the changing phases of the moon"

We chose ''The Law of Moon Phase Change'' published by Education Science Press in the fourth lesson of Unit 3, Volume 3 of Primary Science as an example. The teaching content in this lesson is rather abstract and macroscopic, which is far from the actual life of students.

First, we divided the knowledge into eight parts, the main interface and directory, import module, regular module, demonstration module, drawing board module, exercise module, and ancient poem module (as shown in Figure 1). Secondly, we use ActionScript 3.0 to write action codes for buttons, components, movie clips, etc. Finally, by controlling different buttons to jump scenes to realize the interactive animation.

The following will take the animation production of the import module and the exercise module as an example to elaborate.

The eight kinds of moon phase changes are new moon, waning crescent moon, first-quarter moon, waxing gibbous moon, full moon, waning gibbous moon, last quarter moon, and waning moon. Above all, we need to create eight components in the library, add two layers to each component, draw a black circle on one layer, and draw a moon phase on the other layer. The eight moon phases revolve around the Earth, appearing every four frames. Then we add subtitles according to the animation and make the play, pause, replay, and return buttons. Take the back button as an example. First, we placed the back button at the bottom of the scene. Next, we added keyframes for the four parts: Up, Over, Down, and Hit. When the pointer passes, it will display "Return to the main interface"; when we press down, it will display a concave effect, as shown in Figure 2.
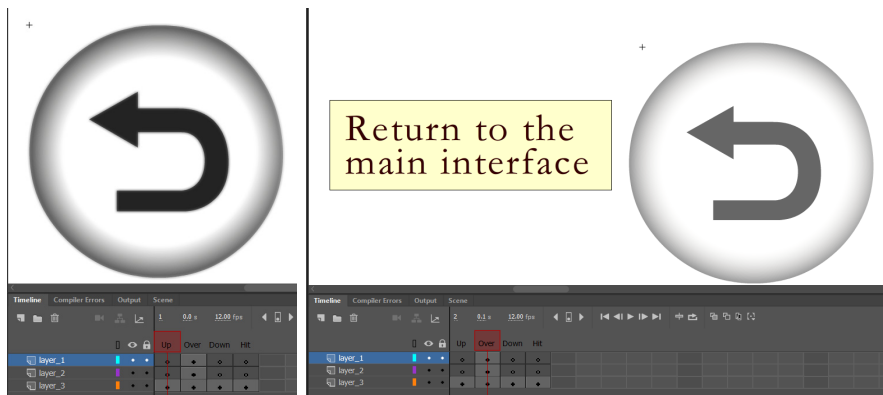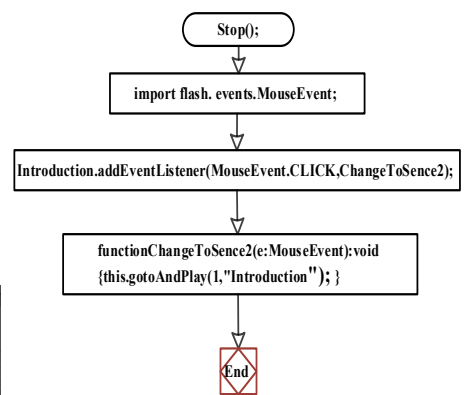

Fig.2   Back button effect

Fig.3   the code steps of the return button

Through the shortcut of the F9 key, we can open the action panel and add the action code to the back button layer to realize the jump of the scene. There are three ways to jump between modules: scene jump, frame jump, or external movie loading [4]. Then we select the scene jump in the import module. The specific code steps of the return button are shown in Figure 3.

The action codes of the remaining three buttons (play, replay, pause) are shown in Figure 4.

There are four multiple-choice questions, three fill-in-the-blank questions, and one connecting question in the practice module. Multiple-choice questions and multiple-line questions will automatically judge themselves right or wrong after completing the questions.
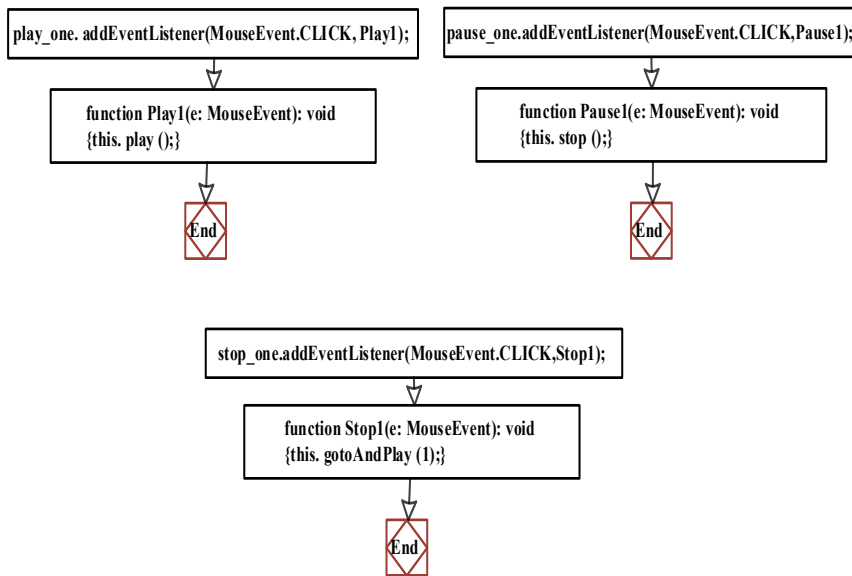
```
play_one. addEventListener(MouseEvent.CLICK, Play1);
```

```
function Play1(e: MouseEvent): void
{this. play ();}
```

End

```
pause_one.addEventListener(MouseEvent.CLICK,Pause1);
```

```
function Pause1(e: MouseEvent): void
{this. stop ();}
```

End

```
stop_one.addEventListener(MouseEvent.CLICK,Stop1);
```

```
function Stop1(e: MouseEvent): void
{this. gotoAndPlay (1);}
```

End

Fig.4 the code steps of the play, replay, and pause button

```
import fl. controls. RadioButtonGroup.
```

```
var group1: RadioButtonGroup=new RadioButtonGroup("group1");
A1. group=B1.group=C1.group=D1.group=group1.
A1.value=B1.value=D1.value="Wrong!Pleasr re-answwer!";
C1.value="Congratulations on your correct answer!";
```

```
group1.addEventListener(MouseEvent.CLICK, ontxt1).
function ontxt1(e: MouseEvent): void
{txt1.text=e. target. selection.value;}
```

```
var format: TextFormat = new TextFormat ();
format. size = 28;
format. color =0xFFFFCC;
A1. setStyle ("textFormat", format);
B1. setStyle ("textFormat", format);
C1. setStyle ("textFormat", format);
D1. setStyle ("textFormat", format);
```
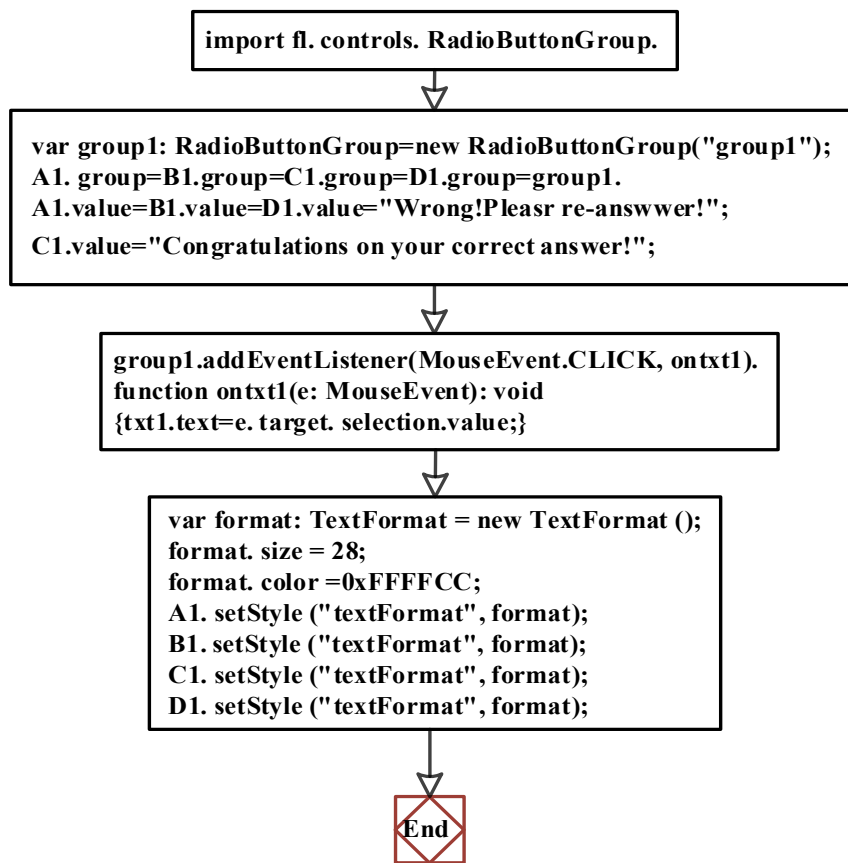
End

Fig.5 the code steps of the practice module

Take fill-in-the-blank questions as an example. First, we placed the question title on the stage and added four RadioButton components to the bottom of the title. The instance names of RadioButton are An, Bn, Cn, and Dn. Secondly, we created a new dynamic text and set the instance name as txtn, put it under the RadioButton, then added the action code (as shown in Figure 5).

5. Conclusion

Nowadays, more and more primary school classrooms have begun to use teaching animation for teaching. The teachers begin to focus on students and think about how to attract students' attention, how to improve learning efficiency, and how to help students solve their doubts. With the continuous advancements of society, more schools and teachers will use teaching animation in various classrooms in the future, not just limited to mainstream subjects, but used in science, music, art courses, etc. The specific examples provided in this study are well-suited to the current psychology of primary school students and school teaching mode. Meanwhile, we applied the animation elements to the classroom and made teaching animations, which can stimulate students' interest in learning and improve students' attention; the most important thing is that the example in this article is an interactive teaching animation, which can improve students' participation in the classroom, and also increase classroom communication between teachers and students. Finally, the idea of designing animation in this study can also be used as a reference for other teachers.

References:

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