

RESEARCH ON TEACHING AIDS BASED ON FREEZE FRAME ANIMATION TECHNOLOGY

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Abstract

With the development of modern educational technology, micro courses, a new type of educational resource, have been continuously developed in school teaching in China. However, the problems encountered by teachers in creating micro lessons have hindered their application and practice. At the same time, students have put forward higher requirements for the presentation form of micro lessons during the learning process. Therefore, it is particularly important to find a more suitable micro lesson production tool for teachers to use and present results that can meet students' needs (Yulong [1]).

Freeze frame animation, as an art form emerging from film art, is easy to produce with low entry requirements, and can reduce the difficulty of micro course design by presenting static images in dynamic effects. Combining the characteristics of various subject knowledge points, use freeze frame animation to create micro lessons to help teachers create micro lessons.

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1. Introduction

Freeze frame animation is a dynamic art created by processing various materials, which allows the audience to experience the charm of the art world through the appreciation of materials, images, and music. Since the development of freeze frame animation, its technology has become an important means of achieving visual expression in animation art. At present, the technology of freeze frame animation in China is becoming increasingly mature. By combining the characteristics of current education and linking freeze frame animation with disciplines, it plays an important role in effectively improving teaching quality.

2. Research Overview of the Application of Freeze Frame Animation in Subject Teaching

2.1. Overview of research abroad

Stop motion, also known as “slow motion”, is a special form of animation that, together with hand drawn animation and computer animation, constitutes the three major categories of modern animation. Freeze frame animation mainly involves arranging, moving, and shooting objects to form a continuous single shot, which is then projected continuously, creating the illusion that the object itself is moving for the viewer. Due to only slight changes in the object between shots, rapid projection can produce continuous action effects (Priebe [4]).

In terms of the disciplinary application of freeze frame animation, foreign educators have attempted to apply freeze frame animation in multiple disciplines, including mathematics, literature, art, history, and so on.

Kervin guides fourth grade students in creating freeze frame animations to help them understand the concept of fractions in mathematics, and ultimately achieves good results. He also proposed a classroom strategy for using freeze frame animation micro classes: modeling production connection. Firstly, the teacher demonstrates the model of the freeze frame animation to the students, and then allows them to communicate and discuss while creating the freeze frame animation. Finally, the teacher connects the knowledge of the freeze frame animation with the teaching outline and deepens their understanding (Kervin [5]).

Lincoln used his iPhone to create freeze frame animations to demonstrate the slow effects of concepts such as parabolas, Doppler effects, Newtonian pendulums, and accelerated motion in physics. He found that freeze frame animations can adjust playback speed, which is beneficial for students to observe and understand phenomena (Lincoln [7]).

In recent years, the application of freeze frame animation in science education has attracted the attention of many scholars. In 2011, Garry Hoban et al. from the University of Wollongong in Australia found that pre-service teachers (college students who are about to become teachers) can help them understand and master complex scientific knowledge by creating freeze frame animated videos, and proposed that this method can also be helpful for high school or other grade students (Hoban et al. [6]).

In summary, freeze frame animation has a long history of development abroad, and the technical means of freeze frame animation are also undergoing reform and innovation. At the same time, foreign teachers have also attempted to integrate freeze frame animation with different subject teaching to study its impact on subject teaching. However, foreign research on a wide range of disciplines, or attempts to focus on certain knowledge points, has not conducted specialized research

on specific grades or disciplines. There is also little literature on how to select materials for the teaching content of making freeze frame animation micro courses and how to apply them in the classroom (Chao [3]).

2.2. Overview of domestic research

Freeze frame animation has a long historical tradition in China, where many freeze frame animated films with ethnic styles have received international attention and are known as the “Chinese School”. Many famous animated films produced from the 1950s to 1980s, such as “Avanti”, “Divine Brush”, “Midnight Chicken Cries”, “Emperor’s Dream”, and “Little Hero”. The stop motion animation of this period mainly drew on a variety of artistic techniques of traditional folk styles, including paper cuttings, clay puppet, shadow puppet, puppet and other quintessence of Chinese culture. The theme of the story also has strong traditional national values. In terms of the integration of freeze frame animation and disciplines, there is mainly a lot of research in the field of art courses, but there is relatively little research on the integration of freeze frame animation with other disciplines. In recent years, there have been only a few articles on the Chinese Journal Network, and they mainly focus on the application in the medical field.

In summary, the application of freeze frame animation in subject teaching needs to be further explored. Developing micro courses that combine freeze frame animation with various subject teaching can not only impart knowledge, but also promote freeze frame animation technology, enabling it to better play a role in modern educational informatization teaching.

3. The Characteristics of Freeze Frame Animation in Subject Teaching Application

3.1. Decomposing complex dynamic knowledge

For some complex and dynamic knowledge, due to the lack of relevant knowledge background or weak spatial imagination ability of some students, it is often difficult to understand the relevant content, and even generate fear of difficulty, which causes them to have significant obstacles in the learning process of new knowledge. And freeze frame animation can gradually decompose complex action changes and present them in a slow form. During the process of watching freeze frame animation videos, students are more able to discover the patterns of changes in the process of slowly advancing the camera, improving the effectiveness of knowledge acquisition.

3.2. Life materials can be used as filming objects

Freeze frame animation can directly use materials from daily life as filming objects, such as cardboard, rulers, pens, erasers, colored pens, model teaching aids, etc. These physical objects are closely related to their real life and are also the most visually stimulating materials. By using intuitive materials to awaken students' past life experiences, knowledge transfer can be more smoothly completed, thereby better completing the learning and understanding of new concepts.

3.3. Adjusting the pause time

Freeze frame animation can flexibly adjust the pause time of the screen. Based on the cognitive characteristics of high school students and the distribution of key and difficult points in teaching content, sufficient time buffer should be reserved for some nodes that need to be considered. This can not only provide students with sufficient time to understand, promote attention and analysis of details, but also reduce their psychological burden during the learning process.

4. The Implementation Strategy of Stop-Motion Animation on the Application of Teaching in Disciplines

First, in the first 1 or 2 weeks of the production of stop-motion animation short films, we mainly study the concept, characteristics, development history and artistic value of stop-motion animation. We will appreciate the excellent stop-motion animation movies and study the behind-the-scenes production methods and materials. At the same time, we will be divided into groups of 3-5 people each, and the task of each group is to complete the production of stop-motion short films within 10 weeks. At the same time, we will recommend a director or a designated director for each group, and other members will cooperate with the director to complete the production of the short film.

Second, stop-motion animation work in the 3rd week, in the 3rd week, we have to put the course creation, character creation, scene design, sub-shot creation and dialogue pre-recording. Teachers guide students to create a script suitable for the shooting of stop-motion animation, as well as the drawing of sub-shots and the calculation of the number of camera frames.

Third, stop-motion animation 4-6 weeks of work, in this stage, students have to prepare the shooting materials, according to the plot and subplot design and manufacture of characters, props and scenes, each group has to have the style of each group. This is the key period for us to practice our students' modelling skills and their ability to collaborate with each other. In this process, we can recommend students to watch good stop-motion films and analyze the characteristics and highlights of the films. Our main task is to demonstrate the production of simple stop-motion animation dolls, aluminum skeleton production, playdough dolls, and the production of eyeballs and limbs, but also to introduce the production of stop-motion animation precautions, so that students can understand the production of dolls of different materials.

Fourth, stop-motion animation the 7th week of work, through the first six weeks of the foundation, a variety of materials have been produced, this time we have to learn the use of digital SLR cameras, photography lighting and other related content, but also to learn the operation of stop-motion animation shooting software. Finally, we have to do the trial shooting, the trial shooting will take about a week's time.

Fifth, stop motion animation 8-9 weeks of work, shooting. First of all, we have to set up the shooting scene, set up the lighting of the scene, use the DSLR camera to shoot, and use the professional stop-motion animation software to assist the operation. Through group cooperation to complete the shooting, the short film stage needs to be maintained for about 3 weeks, each group time slot for shooting, because of the special characteristics of stop-motion animation, in the shooting to focus on the time and the corresponding space, each group shooting time needs 1-2 days.

Sixth, the post-synthesis of stop-motion animation. Use non-linear editing software to synthesize the film clips, dubbing, sound production and visual effects production, and finally complete.

Seventh, upload various platforms: through the need, we can upload the stop-motion animation we filmed to the major video platforms, such as Tencent, Aikiye, Beili Beili, Mooc and other platforms. Similarly, we can also distribute our filmed content to the hands of teachers in major universities to help them teach, investigate their degree of satisfaction, through feedback, we can further optimize.

In the whole learning process of stop-motion animation production, we take group collaborative learning approach, the main modes of collaborative learning are divided into the following categories, mainly: competition, debate, partnership, design, cooperation, problem solving, and role-playing. In the process of teaching stop-motion animation, we should breakdown the learning tasks of the production process of stop-motion short films, and comment on the completion of each group's tasks. Each group should also review each other. In the process of shooting time of stop-motion short films, each group should set up the positions of

director, scriptwriter, photographer, and post-editor. Teaching according to the above model, will get unexpected teaching effects, not only to stimulate students to master the knowledge of the enthusiasm, but also to stimulate the ability of students in all aspects. In the process of role-playing, students have a deep understanding of all aspects of animation production, which will be of great help to their future work (Changpo [2]).

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