The Creation and Dissemination of Popular Science Animation Based on Computer Technology

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Abstract. Science popularization is the popularization of science and technology. In the post-epidemic era, in response to the popular science issues exposed during the epidemic, the creation and dissemination of popular science animations urgently require in-depth reflection and research. The research object of this topic is the creation and dissemination of popular science animation in the post-epidemic era, and the purpose is to use popular science animation to conduct scientific and rational publicity and guidance to the public. The main methods used in this article are questionnaire survey and interview method. The survey results show that about 45% of people think that dynamic design is very important, and 30% think that animation duration is also the key. Therefore, the innovation of popular science animation should focus on these two aspects.

Keywords: Popular science animation · MG animation · Post-epidemic era · Computer technology

1 Introduction

Facing the urgent public demand for popular science knowledge, driven by the Internet, a large number of popular science works appeared in a short period of time in the early stage of the epidemic. Popular science animation is an animation work that disseminates scientific knowledge. Under the background of "big animation" education, animation majors in colleges and universities serve as animation producers and training places for animation talents. The interdisciplinary characteristics of the talent training model should adapt to the development of the times. Therefore, this article studies the methods and teaching directions of popular science animation creation and dissemination under computer technology.

There are many researches on the creation and dissemination of popular science animation under computer technology. For example, Su Chang pointed out that how to deliver scientific and technological achievements to the public vividly, intuitively and quickly requires a communication method that constantly adapts to the development of the times. With its unique advantages, animation has become one of the important

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forms of popularization of science. Zhu Kaiwen said that with the rapid development of three-dimensional animation 3D, its technology has been paid more and more attention. Not only have relevant courses opened in colleges and universities, but also occupy a certain position in the interest science education of young people. Wang Rui said that popular science animation plays an extremely important role in disseminating scientific knowledge. In the new media environment, popular science animation reinterprets the creative form, transmission path and penetration platform field of popular science animation through the characteristics of new media. This article also attaches importance to the role of popular science animation in the post-epidemic era, so computer technology is used to study the creation and spread of popular science animation.

The innovation of this article is to use the Internet as a platform to promote the interaction between science and the public, and to provide new ways to improve the scientific quality of the public. The research on this subject reflects the creative integration of science and humanity, and establishes a public-centered awareness of popular science services. Finally, this article drives the curriculum reform according to the needs of the society, and provides an effective way of thinking for the interdisciplinary and interprofessional development of the profession.

2 Related Work

There are many researches on the creation and dissemination of popular science animation under computer technology [1].

Wolfgang introduced a hybrid animation method, which combines the example based animation method and neural animation method to create a simple but powerful animation system for the face [2]. Remi et al. present a history and recent summary of algorithmic film director research by characterizations of applications that require film directors, and identify promising paths and hot topics for future research [3]. Prashant et al. propose that modern hardware developments have also made possible the development of technologies that enable cloud display and animation at interactive frame rates, review outstanding work in this area and summarize the evolution of this research over time [4]. Artem et al. noted the importance of visual support for educational activities, provided the results of an analysis of computer animation production tools, and described the authors' findings [5].

Under the premise of ensuring scientific and professional, reasonable scientific animation programs should be developed for different groups and regions to meet the personalized needs of part of the public [6].

The popularization and application of computer technology in the field of animation in developed countries has pushed the animation industry to a new stage. In particular, the DIGITAL technology in the United States has reached a mature stage. A variety of international popular production of two-dimensional, three-dimensional and synthetic software is also available, complete functions, and excellent compatibility, suitable for running in a variety of platforms. Chinese computer animation technology closely follows the development of foreign countries and has no lack of independent innovation. However, due to the lack of good script and preliminary design, it can only survive in the middle and late animation processing [7].

The impact of foreign market and the limitation of its own conditions make Chinese animation fall into an awkward situation. Chinese animation has always been in a weak position in the world market, but its development potential should not be underestimated. Only by thoroughly studying the computer animation technology and applying the new thinking and technology in practice can the national animation of our country be revitalized.

3 Creation and Dissemination of Popular Science Animation Under Computer Technology

3.1 Computer Technology

The development of computer technology has brought mankind into a whole new era. As a high-tech industry, popular science animation not only transforms some simple and abstract concepts into intuitive and vivid concrete visual images. In the design of popular science animation, computers are often used to achieve certain effects. The recognition of computer vision technology in images is a basic ability. Human real vision is a process of multi-resolution analysis from coarse to fine. The basic function relationship of wavelet transform can be expressed as:

$$RS_a(x, l) = \frac{1}{\sqrt{x}} \int_{-\infty}^{+\infty} a(s)\beta\left(\frac{s-l}{x}\right)vs = \langle a(s),\ \beta_{xl}(s)\rangle \tag{1}$$

Among them, a(s) is the square integrable function, $RS_a(x, l)$ is the wavelet transform of a(s) and:

$$\beta_{\mathrm{xl}}(s) = \frac{1}{\sqrt{x}}\beta\left(\frac{s-l}{x}\right) \tag{2}$$

Formula (2) is the displacement and scale expansion of the basic wavelet. In addition, in the formula, x is the scale factor, and l reflects the displacement. The equivalent frequency domain representation is:

$$RS_a(x, l) = \frac{\sqrt{x}}{2\partial} \int_{-\infty}^{+\infty} A(\theta)\beta(x\theta)f^{k\theta\partial}c\theta \tag{3}$$

In the formula, $A(\theta)$ and $C(\theta)$ are the fourier transform of a(s) and c(s) respectively.

3.2 Popular Science Animation

Popular science animation is a way to popularize science through animation. It integrates a variety of art forms, and then uses digital technology to produce videos that can be used for scientific communication [8, 9]. Popular science animation is adapted from popular science books, bringing a brand new way of popularizing science for children [10, 11].

(1) Forms of expression

The expression form of popular science animation is logical. In the creative process, the content is presented to the audience in a variety of artistic languages through a reasonable structure. Combine fun, entertainment and life [12].

Its implementation methods mainly include: 1) Video playback. Use words, sounds or images as carriers to express opinions and thoughts and emotions. 2) The audio commentary system plays the content of the program and completes the publicity task. 3) The interactive communication platform publishes news messages to the audience and other related auxiliary function modules to achieve the effect of popular science animation.

(2) Principle

The creation and dissemination of popular science animation is a gradual process. In the epidemic stage, it is necessary to take into account that people in different countries, regions, and different ethnic cultural backgrounds have great differences in scientific awareness and aesthetic concepts. Therefore, when designing popular science cartoons, we must first understand what content can attract the public's attention. The second is to choose appropriate themes to express the theme according to the background of the epidemic. The final step is to apply it to the animation.

(3) Advantages

Popular science dissemination in the new media environment is derived from the combination of traditional media and new technologies. Its greatest advantage is the ability to deliver information to a broad audience. 1) Strong interaction. 2) Aesthetic advantage. 3) Production advantage. The development of new media technology provides convenience for people to obtain news. In this case, traditional media can better deliver news to the audience.

3.3 MG Animation in the New Media Environment

(1) MG animation in the era of new media

MG animation is a language that combines film and graphic design, which is mainly used in the fields of film, TV program design and advertising. In the era of new media, with the development of new media, the efficient features and demands of new media have created more space for dynamic graphics. Animation has also made new developments in the wave of the new media era. MG animation has rich information carrying capacity and diversified visual expressive power.

(2) Features of MG animation

Simplified functions. In the creative process, the creator exaggerated and simplified the performance object, and created the performance object based on points, lines and fundamentals. 2) Plane features. Flat design also represents the mainstream of design in the context of the new media era. In the graphic design of MG Animation, the emphasis is on simple shapes, pure colors and flat outlines.

(3) Technical advantages

MG animation has the characteristics of comprehensive nature, creating MG animation, diversified software cooperation is an indispensable path. Due to the rapid release of digital media technology, the variety of software, and the speed of

update are greatly improved, the software and technical environment involved in the production of MG animation are relatively rich.

4 Questionnaire Survey on the Creation and Dissemination of Popular Science Animation

4.1 Investigation Background

Since the outbreak of the new crown epidemic in 2019, people have gone from panic and turmoil to calmness, and it has taken a long time to achieve this state. In the face of the new crown epidemic and the face of abnormal toxins, our country has taken a calm attitude and proactively dealt with it. The severity of the epidemic at that time and the knowledge of how to prevent it were urgently needed to be understood and followed. Therefore, the popularization of knowledge about the epidemic was necessary at that time and bear the brunt. For science popularization, you need to choose an appropriate method. Therefore, the choice of popular science animation is to attract the public's attention to epidemic prevention with vivid and interesting images.

4.2 Questionnaire Design

The specific survey subjects include students and teachers majoring in art, design, journalism and animation. The content of the survey centered on the related issues of popular science animation and the training methods of animation majors in colleges and universities.

The questionnaire in this article mainly consists of the following questions:

1) The current audience and dissemination of popular science animation. 2) The science and story of popular science animation. 3) How to create popular science animations with high public acceptance in the media environment. 4) The direction in which the teaching design of animation can be improved.

4.3 Questionnaire Process

This survey selected 100 students majoring in fine arts, design and animation to fill in the offline questionnaire. A total of 100 questionnaires were distributed. While the questionnaire was distributed, interviews were conducted with college students. Ask students to fill in while asking, and effectively collect 100 questionnaires. The questionnaire process lasted 2 weeks and was divided into three times. Finally, organize the data.

5 Questionnaire Analysis

5.1 Survey on the Status Quo of Popular Science Animation

According to the survey, there are some problems in popular science animation nowadays. For example, due to the update of the way, the audience has become singular and more suitable for young people. Moreover, the scope of popular science animation is generally small. The specific situation is shown in Table 1:

Table 1. Survey on the status quo of popular science animation

	Audience is monotonous	Small range	Publicity is not in place
Fine arts	10	6	6
Design	12	7	5
Animation	12	10	8
Journalism	13	9	10

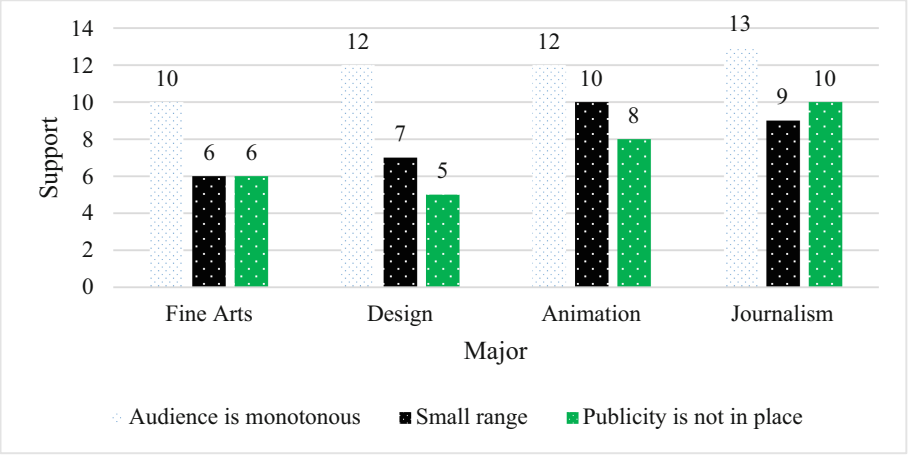

Fig. 1. Survey on the status quo of popular science animation

As shown in Fig. 1, there are 13 people majoring in journalism, and 12 people each in animation and design think that popular science animation audiences are relatively monotonous.

5.2 The Creation and Dissemination Method of Popular Science Animation

According to the survey results, it is learned that the creation of popular science animation can start from the aspects of video, audio, interactive platform and graphic design. Specific opinions are shown in Table 2:

Table 2. The creation and dissemination method of popular science animation

	Smart phone	Computer	Television
Video	10	8	13
Audio	7	5	5
Interactive platform	9	7	9
Graphic design	13	8	6

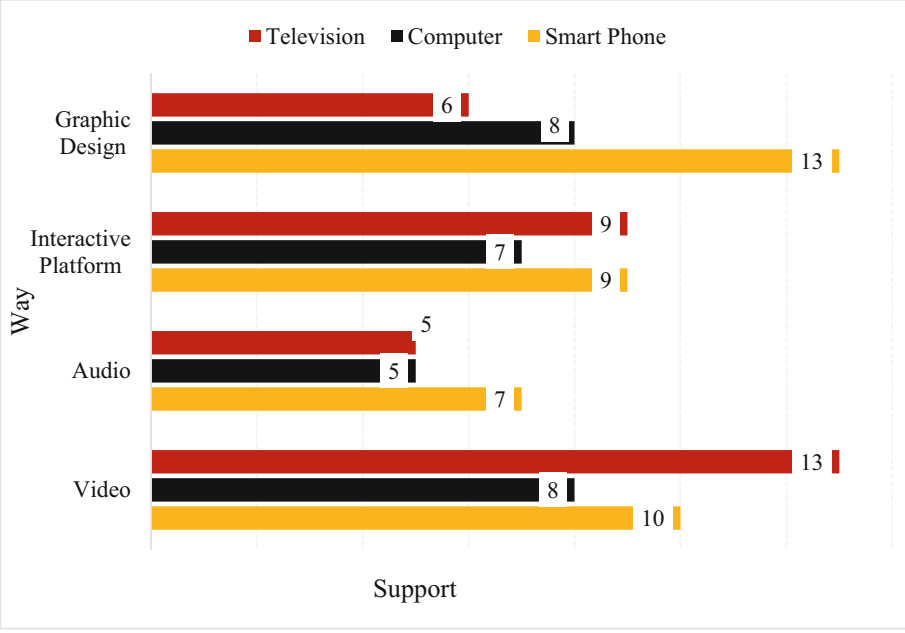

Fig. 2. The creation and dissemination method of popular science animation

As shown in Fig. 2, we can see that most people now learn the knowledge of popular science animation through interior design and TV. As for video and graphic design, they are the two most popular aspects of animation creation.

5.3 Training Direction of Animation Major in Colleges and Universities

The four majors have different views on the cultivation of animation majors in popular science animation in colleges and universities. They discussed in terms of vision, copywriting, and animation duration, as shown in Table 3:

Table 3. Training direction of animation major in colleges and universities

	Visually	Copywriting	Animation duration
Fine arts	43%	24%	33%
Design	40%	31%	29%
Animation	50%	27%	23%
Journalism	34%	36%	30%

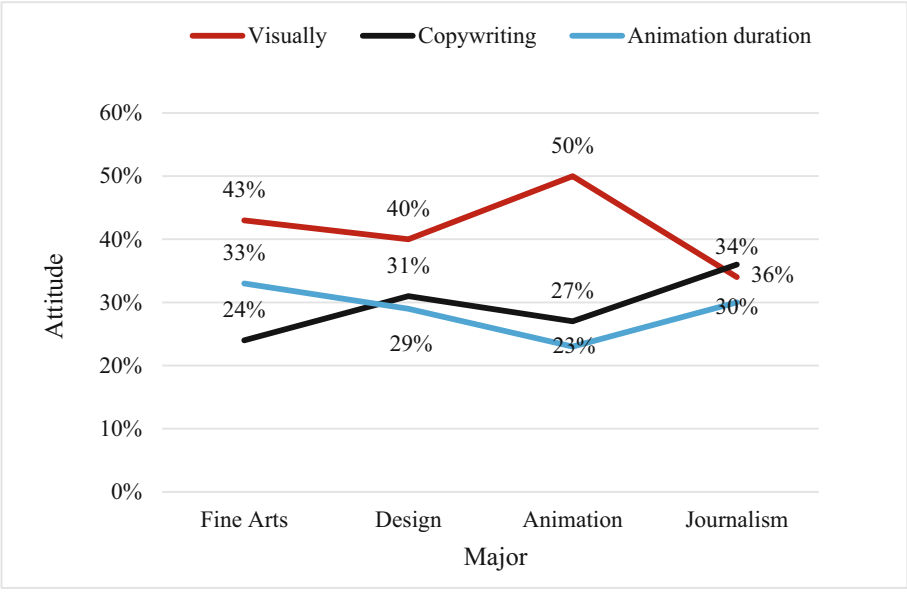

Fig. 3. Training direction of animation major in colleges and universities

As shown in Fig. 3, we can see that different majors agree that the teaching design of popular science animation should pay attention to dynamics. This tells teachers and students from the side that the importance of dynamics in animation design. As for the length of copywriting and animation, the art majors that value time most, and journalism the most valued copywriting.

6 Conclusion

Through a series of research and design of this article, this article provides development ideas for the creation of popular science animation. Affected by the new crown epidemic, network technology, and media changes, social media and self-media facilitate the rapid spread of popular science knowledge. On the premise of ensuring scientific and professionalism, in the face of different groups and regions, formulate reasonable science animation programs to meet the individual needs of some of the public. This article also provides a reference for the training of talents in animation majors in colleges and universities. Aiming at the comprehensive characteristics of popular science animation, it can provide a certain reference value for the training mode of animation professionals.

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