Proceedings of the 4th International Conference on Educational Innovation and Philosophical Inquiries
DOI: 10.54254/2753-7048/20/20231470

Construction of AR and VR Children's Film and Television Education Curriculum System Based on 5G

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Abstract: Film and television (including digital media art) will be explicitly included in the Chinese Compulsory Education Curriculum Plan and Curriculum Standards in 2022, according to the China's Ministry of Education. With the advancement of science and technology, significant changes in film and television production and communication have occurred.5G, AR, and VR technologies are reshaping film and television language expression techniques, presentation forms, and viewing methods. As a result, it is necessary to combine the current development trend of film and television technology, comprehend the science and technology of film and television, master the new expression of film and television language, cultivate children's media literacy as the goal, and build the curriculum system of contemporary children's film and television education, in order to promote the implementation of the curriculum plan and curriculum standards of film and television education.

Keywords: 5G, AR, VR technology, children's film and television education curriculum system

1. Introduction

Computers, smart phones, smart watches, motion sensing devices, and other intelligent terminal equipment are becoming more common as network communication technology and intelligent terminal equipment advance, carrying interactive games, virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) technologies have had a substantial influence on film and television media content production. Using big data and artificial intelligence technology to create a "4K + 5G + AI" new media platform, which will provide more application scenarios and convenient tools for film and television content producers. In November 2021, the state film bureau issued a "Chinese film development plan" to accelerate film science and technology innovation," relying on the national film scientific research force to establish a national film high-tech research laboratory with a focus on cloud computing, big data, 5G, VR, artificial intelligence, machine learning, deep learning, trusted computing, block chain, and other topics, a new generation of information and communication technology and intelligent science and technology in the entire industry chain information construction, cloud, and intelligent upgrade in the overall solution." The film and television technology innovation planning proposal has indicated a new direction for children's film and television education [1].

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Children's film and television education should not only select film and television works based on children's acceptance ability and aesthetic habits, but should also guide contemporary children's media habits.so that children can learn media literacy while also learning about film and television. Therefore, this research will analyze the current situation of children's film and television education, construct new children's film and television content, and establish a curriculum system for children's film and television education with 5G and AR/VR technology, in order to promote the current compulsory education stage film and television education curriculum standards and course program implementation.

2. Materials and Methods

Data is at the heart of the current artificial intelligence development. The film and television industries also use a lot of data processing in the dynamic evaluation of film and television, as well as the analysis of film market trends. Cross-domain data collection is also required in the production of films and television shows. Metrology is also used in the film and television industries, such as Cinemetrics.

Cinemetrics is a systematic and digital method of measuring and analyzing film style. The process includes calculating the formal elements or variables that can reflect the film's style. It has the advantage of being able to provide a more objective, systematic, and accurate video analysis mode.

The incorporation of metrology methods and big data technology into children's film and television education research can provide a new theoretical paradigm and research method to the traditional children's film and television education research. The bibliometrics and network metrology research method is consistent with the new development direction of AR and VR children's film and television education based on 5G.

This research adopts comprehensive research methods, such as bibliometrics and webometrics, to investigate children's film and television education in greater depth. Bibliometrics was integrated into a wide range of disciplines, including sociology, psychology, and education.

The use of bibliometric methods makes secondary information flows that exist in various information databases relatively easily accessible. Furthermore, bibliometrics provides quantitative data to researchers, allowing them to identify trends in a particular problem and make long-term predictions. This is a critical and effective factor in the development of media and educational strategic science in the new realities.

Metrology is also used in the film and television industries, such as metrological cinematography. Metrology of cinema is the systematic and digital measurement and analysis of film style. The process includes calculating the formal elements or variables that can reflect the film's style. It has the advantage of being able to provide a more objective, systematic, and accurate video analysis mode.

The network metrology research method is also used in the study of children's film and television education and teaching.

•Conduct research on publications using web-based tools (journal impact factors, citations per article, and so on).

•Examine the websites of conference journals and conference proceedings where articles are published;• Examine reference lists, and so on.

3. The Current State and Importance of Children's Film and Television Education in the Context of Media Reform

Film and television education is one of the components of art education, which plays an important role in cultivating children to become well-rounded individuals. Film and television education has become an important part of children's art education innovation in the new situation of education

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modernization and information technology. AR/VR and AI technology are widely used in film and television production and communication. As a result of these media changes, film and television education is not only a subset of art education, but also a field that combines art with science and technology.

3.1. Policy Orientation of Contemporary Children's Film and Television Education

The Ministry of Education published the Compulsory Education Curriculum Plan and Curriculum Standards in 2022, which clearly states that film and television (including digital media art) are course content. It is proposed in the learning task to "explore digital media art, appreciate and master digital media art works, understand the form and characteristics of digital media art, interactive forms, and application scenes. Recognize the close relationship between digital media art and science and technology information technology, and regard digital media art as an important means of understanding life and the world [2]. Children are influenced by current and diverse new media content. Based on digital technology, AR / VR technology, network movie AI technology, network animation, and network audio-visual products emerge endlessly.

Children can contact a large number of network film and television works, audio-visual programs, and games via an online education platform, an online platform, or a short video platform. Modern technology can enable image communication technology and film and television content production to present the trend of interactivity and immersion, affecting children's thinking mode, learning style, and aesthetic habits, and putting forward new requirements for children's film and television education.

Children's film and television education must not only be promoted consistently in traditional film and television education, but it must also keep up with the new situation of contemporary media development. Identify new opportunities for the development of "Internet +," artificial intelligence, and 5G technology, and create a curriculum system and learning platform for children's film and television education. The reform and development of film and television education in the stage of compulsory education should be promoted, accompanied by the innovation of education and teaching methods through the full integration of new media tools. This endeavor should be conducted under the guidance of pertinent national policies to ensure its effectiveness and alignment with educational objectives.To strengthen the development of film and television teaching resources, the school film and television education should combine the teaching content of film and television majors with actual application and market demand.

3.2. 5G-based AR and VR Children's Film and Television Education

Since 2020, 5G technology and VR films have been fully integrated and developed, with strong interactivity in VR films. They have a high rate of replay viewing rate, feedback and guidance when compared to traditional film and television works. The use of virtual reality technology in film and television is a novel narrative strategy for future films and television shows. In the context of new media, XR art includes AR, VR, VR, VR (virtual reality), and AR (augmented reality), all of which realize the combination of virtual and reality, with interactivity, multisensory, innovation, interaction, and so on.

In film and television narrative, the integration and application of 5G technology and VR form an interconnected narrative ecology. As a result, from the standpoint of innovative film narrative, it is critical to investigate the narrative characteristics of VR films in the 5G era for children's film and television education as well as children's art education. Now there are AR / VR / MR, and in the future there may be BR (confused reality-Baffle Reality), CR (image reality-Cinematic Reality), DR (blind reality-Deceive Reality), etc. Virtual reality is evolving from the film and television industries

DOI: 10.54254/2753-7048/20/20231470

to the entire art world, gradually forming a set of new art languages. This process is being witnessed and experienced by today's children. As a result, as part of art education, children can further understand the innovative language of contemporary art through film and television education, and can independently connect art with science.

3.3. Immersive Image and Immersive Film and Television Education for Children

The ideal film and television education integrating 5G and AR/VR should have not only visual perception and auditory perception, but also tactile, taste, smell and other perceptions. Real-world and virtual information complement and stack one another. The real world and the virtual image are combined in visual augmented reality. Human-computer interaction and interaction with film and television content are realized in the interaction with the environment, so that people are immersed in the virtual environment [3]. Children can produce more visual, auditory, and tactile linkage in such a virtual environment.

The content of art education is integrated into immersive learning scenes through model, audio, video, and other ways through immersive film and television education based on the characteristics of children's perception. Children strengthen multisensory experiences such as vision, listening, and touch in the dynamic virtual scene, as well as their understanding and memory of the learning content [4].

The concept of virtual reality / augmented reality film and television technology is also known as autonomy, which is reflected in children's independent participation in film and television education. Children in this multidimensional information space can rely on their own multidimensional perception for knowledge, play to the learning initiative, stimulate children's imagination, and stimulate children's desire to explore and create.

4. 5G-based AR and VR Children's Film and Television Education Curriculum System Construction Strategy

Most educators associate film and television education with "film films" in the traditional sense. In fact, film and television education should cultivate children's film and television thinking and media literacy. The development of a curriculum system for children's film and television education should broaden interdisciplinary knowledge while teaching TV advertising noumenon knowledge. The next subsections provide instructions on how to insert figures, tables, and equations in your document.

4.1. Create a Comprehensive Children's Film and Television Curriculum

Film and television include the script, shooting, performance, music, art, editing, and other aspects of the content. Film and television education is a curriculum system that includes information technology, scientific investigation, broad art practice, and other disciplines. In cultivating students' ideal faith, patriotism, ideology, and moral aspects, but also to increase students' knowledge, improve students' comprehensive quality, and meet the needs of students' diverse ability cultivation.

In the stage of compulsory education, film and television education must combine curriculum planning with the development goals and ideas of each stage and discipline, set curriculum goals, and carry out systematic, scientific, and interesting curriculum construction.

4.1.1. Integration of Course Content Across Disciplines

Traditional film and television education in moral education, aesthetic education, and other aspects, as well as Chinese, ideological, and political, has a positive and significant impact. The new film and television education can be combined with courses in information technology, artificial intelligence,

DOI: 10.54254/2753-7048/20/20231470

and other subjects. At the moment, data is the primary content of artificial intelligence development, and data analysis serves as the foundation for artificial intelligence systems to simulate natural systems. The film and television industry also involves a large number of data processing in the film and television dynamic evaluation and the trend analysis, as well as cross-field data collection in the film and television creation.

At the moment , a quantitative data analysis of film aesthetics known as Cinemetrics is emerging in British and American film research. Cinemetrics is concerned with statistics such as lens number, editing rate, lens length, and editing curve, and produces detailed drawing reports using artificial intelligence editing software or a statistical programming platform. For example, the statistical software in the film Cinemetrics depicts time and image narrative as visual data [5]. Fig.1 shows that users only need to input the data extracted by using other tools (mainly computer software) into the corresponding dialog box, then the software will automatically perform statistical processing of data in various forms and purposes, and generate various forms of visual charts according to needs, which is very convenient and efficient [6].

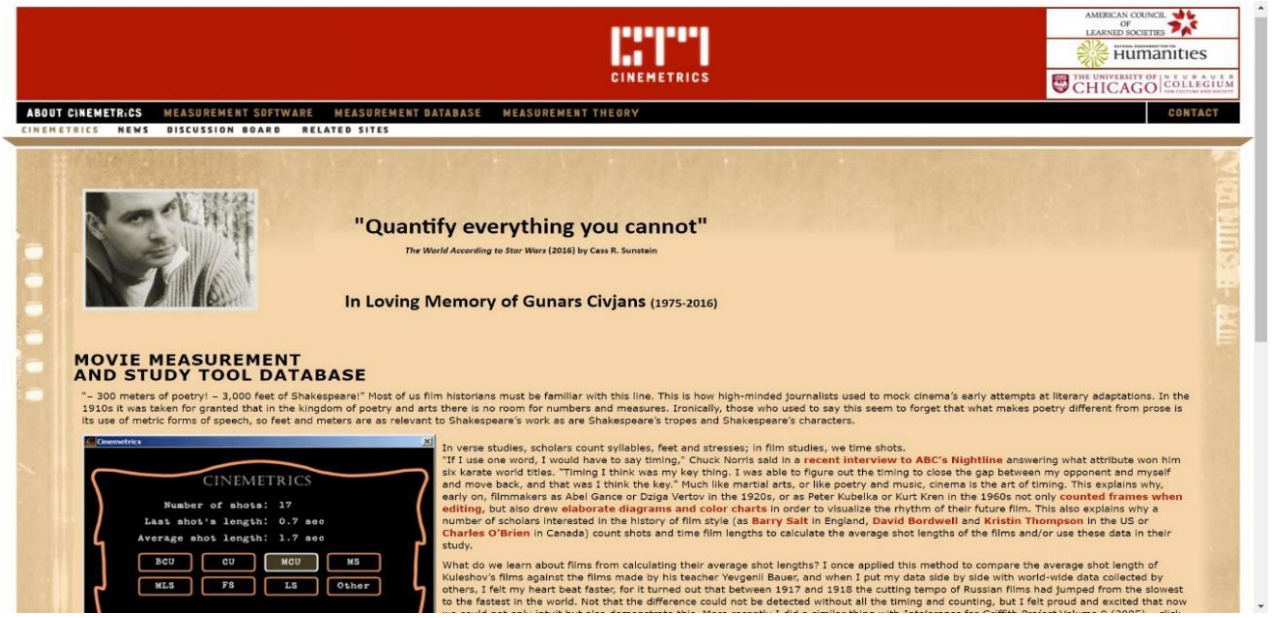

Figure 1: Cinemetrics - originated from an eponymous web-site initiated in 2005 by Yuri Tsivian, a professor from University of Chicago, Department of Cinema and Media Studies.

As a result, the construction of a 5G AR and VR children's film and television education curriculum system must include the integration of content from literature, art, science, and other disciplines, as well as the new trend of film and television development, the content of artificial intelligence and big data analysis.

4.1.2. Setting Multiple Competence Objectives

In line with the current new development of film and television creation and communication, the ability goal cannot be simply set as appreciation of film and television works or evaluation of film and television works in the curriculum setting of film and television education. According to the Compulsory Education Curriculum Plan and Curriculum Standard, students' core qualities in film and television teaching courses can be divided into directing ability, editing ability, information ability, expression ability, cooperation ability, aesthetic ability, innovation ability, and so on. These

DOI: 10.54254/2753-7048/20/20231470

capabilities are linked to 5G, AR/VR technology, and artificial intelligence, and while they are relatively autonomous, they permeate and influence one another.

The form of "film and television" + education covers various forms such as sound, image, text, and video. The film and television language has been continuously developed from 2D painting, 3D image and VR experience, from media to language to grammar, to the "immersion" stage. It is also gradually applied to learning scenarios such as off-campus independent learning space and classroom. In the field of education, film and television education should not only stay in the stage of auxiliary teaching, but also the deep-level media literacy education is the development direction of film and television education in the future.

Using AI for intelligent creation is an important direction and subject for artificial intelligence experts and film and television workers to constantly explore in the field of film and television. In the fields of scriptwriting, film and television production, and other aspects of artificial intelligence. For example, by inputting the corresponding script data into the artificial intelligence system, the stylized creation in the manually specified creation space, and generated and synthesis of film and television production through the algorithm model, according to the inherent format of the script, according to the theme, keywords, script, and other data.

Although AI film and television creation is not yet mature, the content of AI film and television creation should be included in the goal setting of film and television education in order to conduct in-depth exploration and understanding of film and television artists' creation mechanisms.

4.2. Create New Textbooks for Children's Film and Television Education

According to the Compulsory Education Curriculum Plan and Curriculum Standards (2022), "build digital teaching materials with elements such as graphics and text, and reflect the intuitiveness, interaction, and interest to meet the requirements of the digital age." The application of remote communication technology in media integration requires leveraging modern information technology to establish a comprehensive and continually updated curriculum resource database. By employing Internet plus thinking and digital thinking, novel forms of art teaching materials should be explored to enhance the effectiveness of the educational process.

4.2.1. New Technology Enables Film and Television Textbooks

With the rapid advancement of technology, books have evolved into new media books that include sound, animation, a real-time change module, an interactive mode, and other elements. Many publishing houses are currently using AR technology to create 3D models based on the content of paper publications. Interactivity and immediacy, mass and sharing, multimedia and hypertext, personalization and community are all characteristics of new media. Electronic picture books, on the other hand, only convert paper content into digital content, and picture books transition from paper carrier to electronic equipment carrier. In essence, it is still a flat and linear interweaving of text and image that is not interactive or dynamic. Literary and artistic creation has become more complex and dynamic from content to form at the age of new media, which largely subverts the creation, expression, and communication modes of previous literature and art. Fig.2 shows that through the free mobile phone software, you can see what happens in the virtual world of the paper book, and by putting the mobile phone in the mold, you can make VR glasses by yourself, so that readers can see the images of the virtual world [7].

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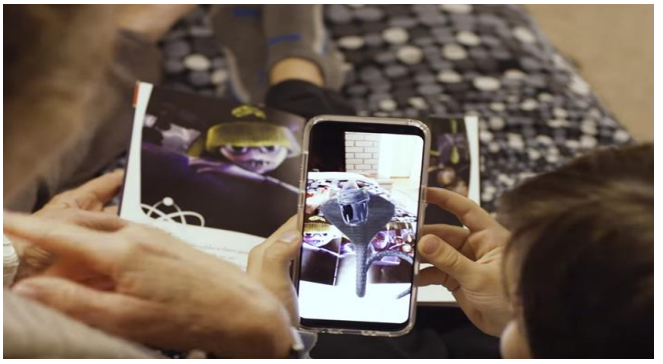

Figure 2: The Quantum Storey Company launched a children's book series "Operation You".

Film and television education textbooks are no longer based on text and picture content, but instead incorporate audio, video, pictures, and animation, in line with the advancement of 5G, AR, and VR technology. Textbooks are no longer available as a single medium, but rather as integrated media. The static form of images and words evolves into the dynamic form of images, words, and sounds over time. The communication content of various media forms can be easily transformed, and the same content can be transmitted in different media forms, especially with the trend of media convergence.

Students can improve their understanding of digital interactive art, develop their aesthetic perception of digital media art, and form their digital media art accomplishment through the textbook.

4.2.2. Improve the Content of Teaching Materials for Film and Television Education

According to McLuhan, "the media's influence is very strong precisely because another medium becomes its content. "New media, film, and television textbooks do not simply transfer the content of paper books to electronic devices and digital platforms, but instead emphasize reading with multiple senses, creating a novel reading experience. Children's thinking is primarily based on specific image thinking, and interactive film and television textbooks of new media are the best form for children to read film and television textbooks.

Children's thinking is primarily based on specific image thinking, and interactive film and television textbooks of new media are the best form for children to read film and television textbooks. This also establishes higher standards for the creation of interactive film and television textbooks, in which dynamic images must be coherent and complete, and picture cohesion, character expression, dynamic action completion, sound, and sound coordination must be compatible with children's acceptance psychology.

AR and VR technology can be used to incorporate Chinese traditional culture content into film and television teaching materials, thereby creating a new framework structure for displaying the image of Chinese traditional culture. The integration of cognitive information across disciplines refers not only to the series of teaching content modules into the system framework, but also to the integration of cognitive information across disciplines and fields.

Throughout the integration process, optimal points of integration between Chinese traditional cultural images and diverse disciplines should be identified. This endeavor aims to amalgamate various categories of culture and art seamlessly.The teaching materials for film and television are not only limited to the form of innovation, but are also reflected in the content of interdisciplinary, cross-field innovation, science and technology, culture, and art, in order to establish children's cultural confidence and cultural consciousness.

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4.3. Create a 5G-based AR and VR Practice Scene for Children's Film and Television Education

McLuhan, a communication scientist, argued that "the media is the message," and that researchers should pay attention to the social phenomenon changes brought about by new media. When designing practical scenes for contemporary film and television education, it is critical to fully comprehend and analyze the impact of film and television works based on 5G AR and VR integration on children and even society, and grasp the changes brought about by new technology films on individuals, as well as social relations and role cognition.

With the advancement of technology, creating a children's immersive film and television learning environment is becoming a reality. VR immersive learning environment can make children learners through practical more specific learning experience, sensing and virtual environment of any object in the most appropriate way, can realize the role into, and enhance the learning experience. Children can play any role in film and television creation using virtual technology, including director, actor, screenwriter, and even design a variety of virtual images to complete the creation of film and television works.

In the network environment with virtual scene learning is a new trend of film and television education, film and television production concept and visual concept is changing, as a film production change virtual production, has a strong interaction, can be roughly divided into four types of -- visualization (visualization), performance capture (performance capture), mixed virtual production (hybrid virtual production), real-time LED wall lens virtual production (live LED wall in-camera) [8].

In simple terms, virtual production is the combination of virtual scene and reality production, virtual production of VR, AR, CGI, and game engine technology, which allows production personnel to see the film and television scene in sight, such as live synthesis and shooting, around the creator personality, pay more attention to the release of inspiration and imagination, more flexible and diverse. The Fig.3 shows Virtual production provides more creative flexibility earlier in the filmmaking process and produces a much higher end-product [9]. As a result, future scenes of children's film and television education may include virtual production scenes, allowing children to use their imaginations freely and see the results of their own personalized creations in real time.

Figure 3: The differences between virtual production and traditional film production.

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If the hardware requirements for this type of virtual production scene are too high at this stage, it will be impossible to create such a practical scene of film and television education in each school, but the advancement of network technology provides a new idea for the scene construction of film and television education. In 2019, AI Lab, a ByteDance-affiliated laboratory, developed Landmark, a technology that detects and calculates outdoor scenes using 3D vision technology and presents AR effects in real time. This technology has now been applied to the TikTok platform; when shooting urban landmarks, you can experience these AR special effects; and this AR camera technology has been introduced into the new generation of short video film and television creation fields.

The Fig.4 shows that Landmark AR technology is developed by ByteDance AI Lab. Through 3D vision technology, it realizes stable detection and tracking of large outdoor scenes [10]. At the same time, combined with a lightweight rendering engine, it can realize various AR special effects lightly and conveniently. It is fast, Low latency, high frame rate and other advantages.

Figure 4: Landmark AR effect of "Fengfei Xi'an Bell Tower" in Xi'an and "Rhythm Guangdong Provincial Museum" in Guangzhou.

5. Conclusion

The influence of technology is not happening at the level of opinions and ideas, but to unswervingly, irresistibly change the feeling ratio and perception mode. Mass media has penetrated into every field of human life. With the rise of artificial intelligence, VR technology, and sensor technology, their increasing implementation in film and television production is expected to expand further. VR applications are projected to interconnect with mobile communication, media, education, and other industries, fostering rapid development in the field [7]. From an artistic point of view, the style, communication and aesthetic experience of contemporary film and television are greatly different from traditional film and television. The aesthetic change of film and television art is unstoppable and unavoidable as technology advances. A dialectical approach should be adopted when applying new technology. In the construction of the new film and television curriculum system, the objective is not solely to expose children to a series of visually impressive videos created through new media technology, but rather to strike a balance between technology and art.

DOI: 10.54254/2753-7048/20/20231470

The integration of interdisciplinary, cross-field, and cross-media innovation has been realized through the application of children's film and television education curriculum system construction based on 5G, AR, and VR technologies in the field of education. Children are naturally curious and want to explore. Film and television education integrated into science teaching can fully stimulate students' desire to explore and activate students' scientific thinking. Using artistic means to depict the scientific inquiry process, the core of which is scientific inquiry. Film and television education can present profound scientific knowledge and scientific principles in a three-dimensional, dynamic, and interactive art form, greatly mobilizing student participation, exerting their learning potential, and allowing students at various levels to fully develop. Multiple intelligences can help students improve their observation, analysis, and communication skills.

The AR and VR children's film and television curriculum system based on 5G represents not only the informatization and intelligence of art education, but also the digital transformation of today's art education concept and education mode, which drives the reform of the overall children's education concept and teaching mode innovation. Based on 5G, AR, VR film and television technology, as well as the multi-level integration of teaching content, teaching media, and knowledge communication channels from various disciplines, breaking through the limitations of traditional education methods to provide interdisciplinary, cross-media, cross-time, and cross-space intelligent education service supply is an effective way to build intelligent teaching.

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