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Application of Short Video Semantic Understanding Technology Based on Big Data Analysis in Education Management

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ABSTRACT

With the emergence of short video and the development of mobile internet, short video software, such as TikTok and Kwai, has emerged. Based on the semantic understanding technology of teaching short videos, a teaching management platform was built to push healthy and positive short video for students' content in a targeted way. Taking the 21st grade students majoring in Chinese in Guizhou Normal University as an example, the authors discusses the effect of teaching management platform on college students. In this process, the following conclusions are drawn: (1) Among college students, the viewing rate of short videos has exceeded 95%, and short videos have become an indispensable entertainment for most college students. (2) Through short video semantic understanding technology and short video screening program, excellent short video can be effectively pushed to students. (3) The actual effect shows that the short video teaching management platform can effectively improve the values of the cultural level of students.

KEYWORDS

Big Data, Education Management, Key Frame Positive Energy, Semantic Understanding Technology, Short Video

INTRODUCTION

Nowadays, short videos are presented in a new form of "music + video + social" and attract the attention and participation of many college students. Short video is a new form of video content created with the help of new media platforms. Each video takes only seconds to watch, meeting the needs of people's fast-paced lives. Users can enjoy audio-visual experiences and obtain refined content in their fragmented time. In the new media era, short videos are undoubtedly another way to share culture (Chen et al., 2020). Short videos are easy to make on a mobile phone without professional equipment, attracting many filmmakers to participate (Dai et al., 2021). In addition, viewing short

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videos is simple; users simply open the app to see rich and diverse content. In addition, short videos allow users to interact and communicate. Therefore, short videos, mobile live broadcasts, and other content affect people's information lives (Abbas & Ojha, 2019; Lynch et al., 2022). In the context of education management, short videos can be used to educate students and establish healthy values (Schneider et al., 2020).

Many scholars have studied and explored the application of short video technology in education (Weber et al., 2018; Sharma et al., 2021). Qiu et al. (2017) proposed a deep spatiotemporal full convolution network architecture (DST-FCN), which trains pixels and voxels in an end-to-end manner, providing an effective means for short video analysis. Qin et al. (2020) adopted a three-layer semantic recognition method based on keyframe extraction, which has a high recognition accuracy based on specific data sets and effectively recognizes the semantics of roles and behaviors in video. An algorithm combining keyframe extraction and video scene semantic recognition has improved the recognition accuracy and effect of video character semantics (Suresha et al., 2020). Drawing on short video podcasts, Kay et al. (2012) and Nie et al. (2019) provided a set of short audio-visual videos that focused on how to solve specific program problems in the field of mathematics, covering five key areas (functional operations, equation solving, linear functions, exponential and logarithmic functions, and trigonometric functions). They found that some college students improved their calculus skills by using these short videos. Chen et al. (2021) analyzed the content of more than 800 TikTok short videos and explored how they can promote students' patriotism as part of online education. Based on the production of short videos, Liu (2021) designed a fuzzy evaluation system for the quality of physical education teaching, formulated a comprehensive evaluation table and calculation formula for physical education teaching, and quantitatively evaluated social science and humanities courses. Ricciotti (2017) developed a teacher training toolkit based on short videos and conducted a comparative experiment to explore the advantages of the toolkit in cultivating students' practical operation abilities. Expósito (2020) applied short videos to academic areas that lagged behind in terms of using multimedia teaching technology, proving the effectiveness of video teaching.

The above research shows that the continuous development of short video semantic understanding technology is required to promote the current short video trend and support learning management. Without short video semantic understanding technology in the face of massive video data, it is impossible to judge the practical significance of short videos, which thus cannot be applied to learning management. Based on the characteristics of existing short videos, we can improve students' cognitive direction through targeted screening of short videos to facilitate the education and management of college students. By analyzing the characteristics of short teaching videos, this paper designs a short video semantic analysis system framework and establishes a short video education management platform to select healthy, positive-energy short video content. The platform can improve teaching quality and stimulate students' interest in learning. Short videos can convey knowledge and skills visually and intuitively, which helps increase students' interest and engagement in learning.

This paper focuses on content innovation. Compared with traditional new media, such as QQ, WeChat, and Weibo, short videos can quickly become popular among college students and stimulate youth participation. The study summarizes the significant features of short videos that make them different from previous communication media, such as their concise content, rich resources, personalized pushing, and two-way interaction. It analyzes how they influence college students by combining these characteristics. On this basis, we explore the current application of short videos among college students through empirical research, incorporating the advantages and positive aspects of short videos, exploring basic principles and specific measures, and providing recommendations for promoting the innovative development of college education in the new era, starting from the educational objects and subjects.

An Examination of High School Students' Online Engagement in Mathematics Problems

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