Chapter 19
Role of Video Content Generation in Education Systems Using Generative AI

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ABSTRACT

This chapter delves into the transformative potential of three cutting-edge models, i.e., CCVS, DreamPose, and Fast Vid2Vid, in reshaping educational video content creation. CCVS, a dynamic framework amalgamating generative and discriminative models, excels in synthesizing high-quality videos from text descriptions. Its versatility in video generation, interpolation, and prediction marks a paradigm shift in educational content development. DreamPose, an advanced AI system leveraging stable diffusion, translates textual descriptions into visually stunning fashion videos. Its user-friendly design caters to diverse fashion styles, making it an ideal tool for educators seeking visually engaging content across disciplines. Fast Vid2Vid, a deep learning model, takes the spotlight for efficiently generating high-quality videos from a single image. Recognized for its realism, it holds promise in dynamic visualizations for educational purposes, spanning virtual and augmented reality experiences. Practical insights and implementation strategies empower educators to seamlessly integrate these models into educational settings, offering a comprehensive guide from planning and scripting to interactive element incorporation. This chapter lays the foundation for educators and content creators to elevate the educational experience through innovative visual storytelling and AI-driven technologies.

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INTRODUCTION

Video content creation using generative AI involves leveraging artificial intelligence algorithms, specifically generative models, to generate, enhance, or manipulate video content. Generative AI, such as Generative Adversarial Networks (GANs) or Variational Autoencoders (VAEs), can be employed to create realistic and novel video sequences (Kumar & Singh, 2023; Kumar et el., 2023). This process typically involves training the model on a large dataset of existing videos, enabling it to learn patterns, styles, and characteristics of the input data. Once trained, the generative AI can produce new video content by generating frames or even entire sequences autonomously. This technology allows for the creation of unique, visually appealing videos, special effects, and animations without the need for extensive manual labour. It has applications in various industries, including entertainment, marketing, and virtual reality, providing a powerful tool for content creators to explore innovative and dynamic visual experiences.

Video plays a crucial role in the education system by providing a dynamic and engaging medium for delivering content (Figure 1). It has become an integral part of modern pedagogy, offering students visual and auditory stimulation that caters to diverse learning styles. Educational videos can bring complex concepts to life, making them more accessible and facilitating better understanding. They also enable educators to create virtual field trips, demonstrations, and simulations, expanding the learning experience beyond traditional classroom boundaries. However, it's important to approach video integration with a mindful awareness of potential pitfalls. One challenge is the risk of passive consumption, where students may become more focused on the entertainment value rather than the educational content. Additionally, issues of accessibility and equity may arise, as not all students may have equal access to high-quality internet or devices. Striking a balance between utilizing videos for enhanced learning experiences and ensuring equitable access requires thoughtful implementation and consideration of individual student needs. By addressing these challenges with empathy and fostering an inclusive learning environment, educators can harness the power of video to enrich the educational journey for all students (Haga, 2002; Aldausari et al., 2022).

To address challenges associated with video content creation using generative AI, several strategies can be implemented. Firstly, to mitigate the risk of passive consumption, educators can design interactive and participatory activities that accompany the generated video content. This encourages students to actively engage with the material, ask questions, and collaborate with their peers. Additionally, incorporating assessments that gauge comprehension and critical thinking skills related to the video content ensures that students are not merely passive viewers but active learners (Wessel et al., 2023).

To tackle issues of accessibility and equity, educators should be mindful of the varying technological resources available to students. Providing alternative means of accessing content, such as transcripts or written summaries, can accommodate different learning preferences and address challenges related to internet access or device availability. Furthermore, schools and institutions can work towards ensuring equitable access to technology, bridging the digital divide and promoting inclusivity in the learning environment. Continuous monitoring and improvement of generative AI models are essential to enhance the accuracy and relevance of the content generated. Regular updates and refinements to the algorithms can help address any biases or limitations that may emerge during the content creation process. Additionally, involving students in the feedback loop by encouraging them to provide insights on the generated content fosters a collaborative and adaptive learning environment.

The aim of video generation for educational content creation is to enhance learning experiences by leveraging multimedia tools to deliver information in engaging and accessible formats. By incorporating