

Implementing Video-Based Knowledge Points in the Course of Human Anatomy: A Pedagogical Innovation for Preventive Medicine

Implementación de Puntos de Conocimiento Basados en Video en el Curso de Anatomía Humana: Una Innovación Pedagógica para la Medicina Preventiva

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SUMMARY: Strengthening the training of preventive medicine talents is crucial for improving public health in China. A solid understanding of human anatomy plays an indispensable role in the training system of these talents. To enhance the teaching effectiveness of human anatomy in preventive medicine, we have developed video clips based on key knowledge points. These video clips have been shown to serve as an important auxiliary tool for students, facilitating the acquisition of professional knowledge, enhancing their interest in studying human anatomy, and fostering independent learning abilities. Consequently, this approach lays a solid foundation for the comprehensive training of preventive medicine talents.

KEY WORDS: Human anatomy; Preventive medicine; Video-based knowledge.

INTRODUCTION

The cultivation of highly skilled professionals in preventive medicine stands as a cornerstone in safeguarding population health and ensuring robust public health systems (Peik *et al.*, 2016). Against the backdrop of China's Healthy China 2030 Planning Outline, societal imperatives have imposed more rigorous standards for the development of preventive medicine expertise, exposing the limitations of conventional didactic instruction in addressing the multifaceted competencies required by contemporary public health challenges (Chen *et al.*, 2019).

Traditional pedagogy, anchored in classroom-bound instruction, increasingly fails to align with the dynamic demands of modern healthcare ecosystems (Estai & Bunt, 2016). Consequently, the progressive transformation of educational methodologies emerges not merely as an adaptive measure but as an evolutionary imperative. This pedagogical evolution is indispensable for cultivating a new generation of preventive medicine specialists equipped to navigate the complexities of 21st-century public health—spanning emergent infectious diseases, epidemiological transitions, and the integration of interdisciplinary innovations in health science (Shin *et al.*, 2022).

A profound understanding of human anatomy is paramount in the development of rigorous medical thinking, serving as the bedrock upon which clinical acumen and therapeutic decision-making are built (Polat *et al.*, 2024). As a discipline, human anatomy is concerned with the meticulous examination of the human body's structural organization at both macroscopic and microscopic scales, encompassing a vast and intricate vocabulary that can be daunting to master (Santos *et al.*, 2022; He *et al.*, 2024). The complexity of anatomical science, replete with arcane terminology and nuanced conceptual relationships, presents significant challenges for learners seeking to internalize its principles. Nevertheless, the effective retention and comprehension of human body structure knowledge are essential for establishing a robust foundation in medical science, facilitating the subsequent acquisition of advanced clinical competencies.

The temporal constraints inherent to traditional classroom instruction necessitate a strategic approach to knowledge consolidation, as the limited time allocated for didactic transmission can result in inadequate comprehension and retention of complex anatomical concepts. To mitigate

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this, it is essential for students to engage in prompt review and reiterative practice of key concepts following initial exposure. In response to these pedagogical challenges, the introduction of innovative educational modalities, built upon the foundation of established teaching methods, is warranted. Such hybrid approaches, incorporating cutting-edge technologies and evidence-based learning strategies, can enhance the efficacy of anatomical instruction, ultimately ensuring that preventive medicine students acquire the profound understanding of human anatomy necessary for outstanding clinical performance.

The utilization of video clips as a pedagogical tool can significantly enhance the dissemination of knowledge regarding human body structure, thereby aligning with the morphological teachings of human anatomy (Youssef *et al.*, 2023). By leveraging the intuitive and informative nature of video content, students can transcend the limitations of traditional textbooks and classroom instruction, accessing a more engaging and effective learning experience. The convenience of video playback facilitates flexible learning, enabling students to review and reinforce their understanding of complex anatomical concepts during fragmented periods of time, thereby optimizing their study habits (Grosser *et al.*, 2019; Dharamsi *et al.*, 2022).

In response to the imperative of improving the teaching efficacy of human anatomy and empowering preventive medicine students to achieve mastery of the subject matter, a student-centered approach was adopted. By considering the learning needs, habits, and expectations of students regarding human anatomy instruction, a suite of video clips focusing on key knowledge points was developed. These video modules serve as a vital adjunct to traditional teaching methods, providing students with an autonomous learning resource that can be readily accessed and reviewed. The incorporation of video-based learning tools is poised to enhance students' learning outcomes, cultivate their capacity for self-directed learning, and establish a robust foundation for subsequent academic pursuits.

MATERIAL AND METHOD

Subjects of the study. Grade 2021 undergraduates majoring in public health and preventive medicine in the School of Basic Medicine, Wuhan University were selected as the research objects.

Teaching methods and evaluation. The study includes two aspects: students' needs for video clips as one of teaching methods and the impact of this method on students'

learning effect. After the course, a QR code was sent to the students through QQ group, and the students used their mobile phones to scan the QR code to fill in the questionnaire online, and the analysis of the proportion of students' grades was analyzed by GraphPad Prism software.

RESULTS

Video-based learning of human anatomy meets the needs of students. Video clips of knowledge points provide a method for learning human anatomy. To confirm whether this method can effectively integrate into students' learning approaches, we collected students' needs and attitudes through questionnaires.

The results of the questionnaire indicate that the vast majority of students expressed a strong interest in viewing and learning from video-based knowledge points. Specifically, 44.34 % of students reported being “very interested,” and 43.30 % were “somewhat interested.” Additionally, 46.23 % of students said they frequently watch the videos recommended by their teachers. Moreover, 87.74 % of students would recommend the valuable video clips to their classmates, with 49.06 % recommending them often and 38.68 % recommending them occasionally. Notably, only 3.87 % of students were not interested, and no student was disinclined by this learning method. These survey results demonstrate that students widely accept this learning approach based on video clips (Fig. 1).

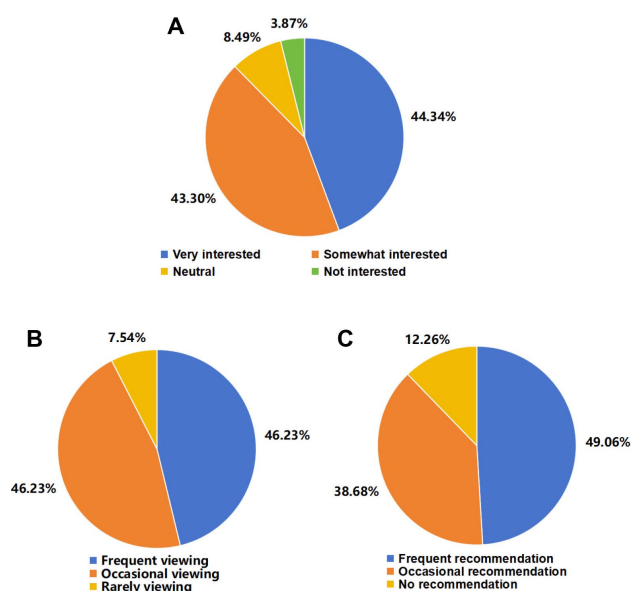


Fig. 1. Survey of needs and attitudes towards video clips of knowledge points. A. Students' interest in short videos of human body structure. B. Frequency of watching short videos of knowledge points. C. Students' communication with each other on short videos.

Video-based knowledge points are conducive to students mastering human anatomy. The purpose of video clip based on knowledge point is to facilitate students to master human anatomy knowledge, and at the same time improve students' interest in learning human anatomy and cultivate their ability to learn independently. Through a questionnaire survey, there were 86.79 % of the students (of which 28.3 % thought it was very helpful, and 58.49 % thought it was relatively helpful) thought that the video clips based on knowledge points were helpful for them to master human anatomy knowledge, and 83.97 % of the students (33.02 % of them thought it greatly improved their learning efficiency and 50.95 % thought it relatively improved their learning efficiency) thought that method was very helpful to improve their learning efficiency, and 85.85 % of the students (48.11 % of the students thought that it was very helpful to exercise the independent learning

ability and 37.74 % thought that it was relative helpful) thought that could exercise the ability of independent learning in this way. According to the results of the final examination, the grade 2021 students in lower scores decreased significantly compared with the previous grade (Fig. 3). This indicates that the video-based learning method is more beneficial for students in mastering human anatomy knowledge, thereby enhancing teaching efficiency (Fig. 2).

DISCUSSION

Preventive medicine is an applied discipline dedicated to safeguarding national health. Students pursuing this field require a robust theoretical foundation to flexibly apply their knowledge to practical problems. In traditional human anatomy instruction, the primary method involves the use of words, pictures, and descriptive language as the primary means of conveying information to students. This often leads to rote memorization, which can result in a lack of deep understanding and retention of the material. Consequently, students may find the course content difficult to grasp and may perceive it as monotonous, thereby reducing their interest and engagement (Patra *et al.*, 2022). Furthermore, this pedagogical approach fails to facilitate the application and innovation of knowledge, falling short of meeting the objectives and needs of modern preventive medicine education. The advent of video clips has addressed the inherent limitations of traditional teaching modes, providing students with a flexible platform to revisit and relearn knowledge points they may have previously struggled with (Navarrete *et al.*, 2025; Stark *et al.*, 2025). Additionally, video-based learning environments facilitate peer-to-peer communication and interaction, thereby enhancing students' interest in learning and fostering their independent study skills (Youssef *et al.*, 2023).

Fig. 2. Investigation on the effect of video clips on learning human anatomy. A. The help of video clips on learning human anatomy. B. Improvement of learning efficiency in human anatomy based on video clips. C. Improvement of independent learning ability in human anatomy based on video clips.

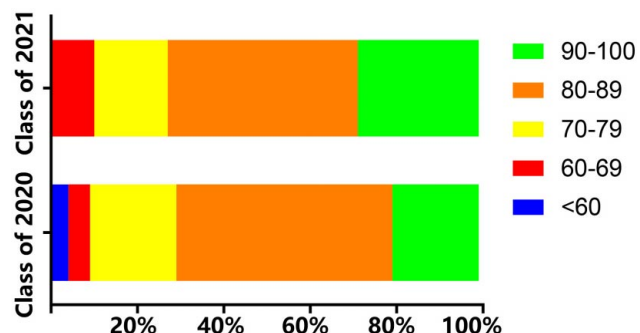


Fig. 3. Analysis of the proportion of students in each score range.

platforms offer high-quality short educational videos that can be seamlessly integrated into the teaching curriculum (Baile *et al.*, 2025). Our institution has introduced the "Digital Human 3D Body" and "Complete Anatomy" digital simulation software, enabling students to independently explore and understand the human anatomy after class.

It is important to note that video-based knowledge points possess both educational and entertainment attributes. Balancing these elements is essential to maximize the advantages of short videos for educational purposes. By carefully integrating these elements, we can enhance the overall educational experience and ensure that students maintain both interest and engagement in their studies.

The videoization of human body structure knowledge points presents a significant opportunity for both students and teachers. For students, this approach not only enhances their independent learning abilities but also significantly improves the learning outcomes of human anatomy. Teachers, on the other hand, face new challenges in summarizing and analyzing the key knowledge points, presenting them through short videos, and ensuring that the content is positive and aligned with core socialist values. These challenges are essential for cultivating preventive medicine talents and supporting the sustainable development of modern medical education in line with the evolving times. The use of video content for teaching also provides valuable references for the pedagogical reform of other disciplines.

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RESUMEN: Fortalecer la formación de profesionales de la medicina preventiva es crucial para mejorar la salud pública en China. El conocimiento sólido de la anatomía humana desempeña un papel indispensable en el sistema de formación de estos profesionales. Para mejorar la eficacia de la enseñanza de la anatomía humana en la medicina preventiva, hemos desarrollado videoclips basados en puntos de conocimiento clave. Estos videoclips han demostrado ser una herramienta auxiliar importante para los estudiantes, facilitando la adquisición de conocimientos profesionales, fomentando su interés por el estudio de la anatomía humana además de su capacidad de aprendizaje autónomo. En consecuencia, este enfoque sienta una base sólida para la formación integral de profesionales de la medicina preventiva.

PALABRAS CLAVE: Anatomía humana; Medicina preventiva; Conocimiento basado en video.

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