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Editorial

Visualization to innovation: Role of 3D models in medical education

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3D models play a significant role in the field of human anatomy by providing a visual representation of the complex structures and systems within the human body. 3D models have transformed the teaching and learning of human anatomy including their roles in enhancing spatial understanding, promoting active learning, improving retention and facilitating interdisciplinary collaborations.[1] There are some specific roles of 3D models in human anatomy in the areas such as:

Education and training: 3D models enable students, medical professionals, and researchers to study and understand the intricacies of human anatomy in a more interactive and realistic manner. They can be used in classrooms, anatomy labs, and virtual learning environments to enhance education and training programs.[2]

Visualization and spatial understanding: 3D models allow users to visualize anatomical structures from different angles and perspectives. This helps in developing a better understanding of the spatial relationships between different body parts, organs and systems.[3]

Surgical planning: Surgeons and medical practitioners can use 3D models to plan complex surgical procedures. By creating patient-specific anatomical models based on medical imaging data (such as CT scans or MRIs) surgeons can simulate the procedure, assess potential challenges, and plan the optimal approach for surgery. This can improve surgical precision, reduce risk and enhance patient's treatment outcomes.

Patient education: 3D models enable healthcare professionals to explain medical conditions and treatment options to patients in a more visually engaging manner. By visualizing the affected areas and demonstrating the impact of various procedures, patients can have a clearer understanding of their condition leading to better and informed decision-making.[3]

Research and development: 3D models provide a valuable tool for anatomical research and the development of new medical devices and treatments. Researchers can use 3D models to investigate the structure and function of organs, simulate physiological processes and study the effects of diseases or interventions.[2]

Virtual and augmented reality applications: 3D models can be incorporated into virtual and augmented reality applications, allowing users to immerse themselves in realistic anatomical environments. This technology offers an interactive and engaging way to explore human anatomy, enhancing learning experiences and facilitating hands-on training.[4]

Overall, 3D models play a crucial role in human anatomy by improving education, facilitating surgical planning, enhancing patient communication, enabling research and advancing medical technologies. They provide a powerful visual representation that complements traditional anatomical studies which provides a deeper understanding of the human body and its complexities.

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