

Teaching and learning human anatomy using a 3-dimensional computer graphics learning tool: Considerations and benefits

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Given recent trends in budgeting, academic libraries must implement fiscally responsible decisions to support student learning and institution-wide sustainability goals. Rising prices paired with budget cuts has forced difficult decisions to ensure sustainable access to quality resources at affordable costs. A notable example is the recent emphasis on developing and using open educational resources. Miami University Libraries recently acquired an innovative learning tool called Visible Body-Human Anatomy Atlas, a 3-dimensional computer graphics (3DCG) application that provides accurate human anatomy models, including augmented reality, to develop sustainable access to quality teaching and learning resources in the biomedical and health sciences fields. It is reusable, has no up-front cost to students, and is cheaper than acquiring, maintaining, and disposing of embalmed or plastinated cadavers (Bushey, 2013; Shoepe, 2008). Our long-term goals for this resource are to supplement classroom teaching and learning, as well as potentially replace anatomy textbooks and specimens.

The Visible Body-Human Anatomy Atlas provides sustainable, hands-on, interactive learning opportunities for students and faculty. Users can search and browse through a comprehensive collection of structures and systems that can be digitally dissected in 3-dimensions, reattached, rotated, and more. Its depictions of anatomical structures and systems are more realistic than traditional 3D plastic models and 2D renditions. Students can also quickly access definitions, functions, and common pathologies of structures within the dissection environment. To facilitate learning, students can complete self-guided active learning tutorials, instructor-designed lab activities, create study note cards, and take quizzes. Importantly, the Atlas is also easily accessed using any computer or mobile device, making it especially helpful for students in online teaching settings. These strengths increase intrinsic motivation to learn and therefore overall student success.

This resource compliments learning objects currently used by Miami University faculty. Within the dissection environment, faculty can create and annotate anatomical dissections (both static images and dynamic content) to present in class, and then send these to students (via email or Learning Management System) for at-home review. Faculty can also assign students to conduct their own dissections, and similarly receive reports or videos of their students' work. It can supplement student learning using Miami University's Anatomage Table. Students report a high degree of enthusiasm for this resource. According to one Miami University student, the high level of detail, study quizzes, and ability to study material for brief intervals of time on the Visible Body app such as while sitting on the bus makes the resource particularly valuable (K. Shaw, personal communication, November 28, 2018).

3DCG anatomical atlases provide a promising solution for developing fiscally responsible collection management decisions to support student learning outcomes and university initiatives. We are grateful to have acquired this resource with internal grant funding, as initial investment was high. Comparison analyses of reviews, ratings, and features of other 3DCG anatomical atlases were conducted. Librarians and faculty members in multiple departments further evaluated this resource prior to acquisition to ensure a good return on investment.

References

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