Advances in Anatomy Teaching in Higher Education

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Purpose

To evaluate common anatomy teaching tools from both student and instructor / institution perspectives. Evaluation criteria includes the Course Requirements and Learning Objectives.

Methods

1. Literature review
2. Anecdotal data from faculty, students, and vendors

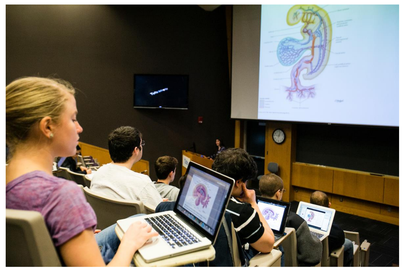
Each tool was evaluated on a 3 point scale using the following criteria (compared to a living human):

Accuracy
Does the tool accurately represent human anatomy including macro, micro, and 3D structures as well as the position of a structure within a broader context?

Cost
What is the return on investment after factoring in acquisition, operation, and maintenance costs, preparation time, and ethical considerations?

Usability / Ease of Use
How easy / fast is the tool to set up, to navigate and manipulate, and to customize to specific teaching and learning styles and environments? Also, how reliable and accessible is the tool?

Examples of common use for each type of tool



Static Images

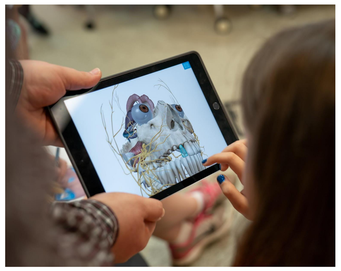
Alonso Nichols / Tufts University

Prepared Specimens

Matthew McMurray / Miami University

Plastic Models

Mesa Community College in Mesa, AZ ©



Mixed Reality

Nick Kneer / Miami University

Evaluation criteria of anatomy teaching tools

Table 1

Teaching Tool	Student: Accuracy	Student: Cost	Student: Usability	Instructor / Institution: Accuracy	Instructor / Institution: Cost	Instructor / Institution: Usability	Notes*
Static Images	☺	☺☺☺	☺☺	☺	☺☺☺	☺☺	
Prepared Specimens & Samples	☺☺☺	☺☺[1]	☺	☺☺☺	☺	☺	1 Ethical concerns may impact cost for some students / faculty
Plastic Models	☺☺	☺☺☺	☺☺	☺☺	☺[2]	☺☺	2 Can be custom made using 3D printers to reduce cost
Mixed, Augmented, & Virtual Reality (MR)	☺☺	☺☺	🤔[3]	☺☺	☺	🤔[3]	3 Varies by user interface

Conclusions

1. Attend to Evaluation Criteria (Table 1), Course (Table 2), and Learning Outcomes when selecting a tool. Consider using multiple tools within a course.
2. Successful implementation of MR requires a team-based approach including expertise in the subject taught, instructional design, IT, & acquisitions.
3. Caveat: Reliability of between-group comparisons was negatively impacted by within-group variance.

Suggested Tools For Common Anatomy Courses

Table 2

Introductory Anatomy & Physiology	Static Images, MR
Advanced Pre-Health & Pre-Med	All (Specimens & MR preferred)
Engineering, Art, IT, Other	Specimens, MR