Hands-on dissections

Hands-on dissections refer to the process of physically examining and dissecting specimens, typically in a laboratory or classroom setting. Dissections can be performed on a variety of specimens, including animal organs, plants, and other biological materials.

Hands-on dissections are an important part of many biology and anatomy courses, as they provide students with a hands-on understanding of the structure and function of biological organisms. They can also be used in research settings to examine the internal structures and systems of animals and plants.

During a dissection, students typically use scalpels, forceps, and other specialized tools to carefully separate and examine the various structures of the specimen. This process can be time-consuming and requires a high level of attention to detail, but it can provide a deeper understanding of the complexities of biological organisms.

While hands-on dissections are a valuable tool for learning about biology and anatomy, they can also be controversial due to ethical concerns about the treatment of animals. Some organizations advocate for alternative methods, such as virtual dissections or the use of models and simulations, as a more humane and sustainable approach to teaching and research. Ultimately, the use of hands-on dissections should be carefully evaluated based on the specific educational or research goals, ethical considerations, and availability of alternative methods.

Supplementary pedagogical tools, for instance, 3D models of anatomical specimens acquired with photogrammetry are an efficient alternative to democratize the 3D anatomical data.

de Sá Braga Oliveira et al. described a technical guideline for acquiring realistic 3D anatomic models with photogrammetry and improving the teaching and learning process in neuroanatomy. Seven specimens with different sizes, cadaveric tissues, and textures were used to demonstrate the step-by-step instructions for specimen preparation, photogrammetry setup, post-processing, and display of the 3D model. The photogrammetry scanning consists of 3 cameras arranged vertically facing the specimen to be scanned. In order to optimize the scanning process and the acquisition of optimal images, high-quality 3D models require complex and challenging adjustments in the positioning of the specimens within the scanner, as well as adjustments of the turntable, custom specimen holders, cameras, lighting, computer hardware, and its software. MeshLab® software was used for editing the 3D model before exporting it to MedReality® (Thyng, Chicago, IL) and SketchFab® (Epic, Cary NC) platforms. Both allow manipulation of the models using various angles and magnifications and are easily accessed using mobile, immersive, and personal computer devices free of charge for viewers. Photogrammetry scans offer a 360° view of the 3D models ubiquitously accessible on any device independent of the operating system and should be considered as a tool to optimize and democratize the teaching of neuroanatomy [1)].

1)

de Sá Braga Oliveira A, Leonel LCPC, LaHood ER, Hallak H, Link MJ, Pinheiro-Neto CD, Morris JM, Peris-Celda M. Foundations and guidelines for high-quality three-dimensional models using photogrammetry: a technical note on the future of neuroanatomy education. Anat Sci Educ. 2023 Mar 19. doi: 10.1002/ase.2274. Epub ahead of print. PMID: 36934316.