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POSTER ABSTRACT

Down to the bone: a pilot study into the effectiveness of 3D versus 2D learning in anatomy education.

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Possessing excellent anatomical knowledge is crucial for every health care trainee, including medical and physiotherapy students. Hands-on sessions in the dissection class form the cornerstone of anatomy education. Recent years increasing student numbers and decreased availability of time within the anatomy dissection room, forces the development of alternative teaching methods to use the dissection class as efficiently as possible. Most alternatives include video recordings and books (2D), but also 3D high-fidelity models (3D-HFM). These are anatomically accurate, morphable and dynamic 3D models that result from scanning cadaveric specimens. It is assumed that 3D-HFM have some learning benefits over 2D-models. Development of 3D-HFM is a cost- and time-consuming task and the effect of 3D learning into anatomy education needs to be further evaluated before it can be properly integrated into the program. Therefore, a pilot study is set-up to investigate the learning effect of manipulable 3D-HFM.

The pilot study focuses on the effect of using static 2D atlas-type models (2D-ATM) versus manipulable 3D-HFM on learning processes and outcomes when studying and preparing for hands-on osteology of the skull in first-year physical therapy students. 10 students will be randomly assigned into 2 groups (n=5). Students will be invited one-by-one to the Antwerp Social Lab. After having measured their prior anatomy knowledge and spatial ability, students will watch a knowledge clip explaining the basics of the skull. Then, depending on the condition, students are given either static 2D-ATM or manipulable 3D-HFM to study (as if for an exam) the osteology. While learning, students' eye movements and electroencephalography (EEG) are collected to capture students' cognitive load. Log data of their actual manipulation of the 2D-ATM or 3D-HFM is collected as well. When finished, students are given a post-test that maps their anatomical knowledge about the osteology of the skull using (1) nominal questions on pictures and x-rays, and (2) more complex questions capturing students' insight. Finally, a practical test on a physical skull bone is administered that requires students to recognize certain structures and underlying relationships.

This pilot will form the basis of a broader research into innovation in anatomy education. Further research is needed to investigate to what extent online 3D-HFM are appropriate to improve the learning process and outcome compared to 2D-ATM. These studies should also examine the effect of 3D-HFM can compensate for the decreased time spent in the dissection room.