

Enhancement of Student Learning through the Incorporation of Virtual Reality Simulation when Studying Anatomy

TESSA LEWIS

Fondren-Jones Science Center; Kinesiology; Southwestern University; Georgetown, TX

Category: Undergraduate

Advisor / Mentor: McLean, Scott (mcleans@southwestern.edu)

ABSTRACT

The opportunities provided by virtual reality (VR) are substantial and it is crucial that we recognize the potential application of this advancing technology. **PURPOSE:** To measure and compare student learning of anatomical structures when studying in virtual reality simulation and when studying using traditional physical models. **METHODS:** Ten undergraduate students were randomly assigned to either group A or group B and attended two sessions, each lasting 60 minutes. During session one, each participant first completed a pre-test based on pelvic girdle anatomy in under 15 minutes. The first pre-test consisted of 7 fill-in the blank questions with a word bank provided. After completing given pre-exam, participants from group A studied the anatomy of the pelvic girdle independently for up to 30 minutes using VR (virtual reality) goggles on Organon 3D application. Participants from group B independently studied pelvic girdle anatomy on a skeletal model for up to 30 minutes. Following the 30 minutes of study, participants completed a post-exam in under 15 minutes. The first post-test consisted of 7 fill-in the blank questions with word bank provided based on pelvic girdle anatomy. Within the same week, participants attended a second session. Participants first completed a pre-test based on the anatomy of the spine, in under 15 minutes. The second pre-test consisted of 7 fill-in the blank questions with a provided word bank. Following the completion of the second pre-test, each participant from group B individually studied spinal anatomy for up to 30 minutes, using VR (virtual reality) goggles on an app called Organon 3D. Participants from group A individually studied spinal anatomy on a skeletal model for up to 30 minutes. Succeeding the second study session, participants finished a post-exam based on the anatomy of the spine. The second post-exam composed of 7 fill-in the blank questions with a word bank provided. **RESULTS:** Exams scores were converted to percentages for data analysis. The average pre-exam score for VR= 60.7% and for Skeletal models= 44.6%. The average post-test score for VR= 66.1% and for Skeletal model= 82.1%. There was not a significant difference between studying for exams on VR vs. studying on skeletal model ($P < 0.090$, $\eta_p^2 = 0.355$). **CONCLUSION:** Previous studies have suggested VR as a study tool has a significant effect on learning, these findings suggest that there is not a significant difference between study modes. These findings may also suggest that these modes are comparably beneficial for student learning.