

## ACS 2022 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

### Research Abstracts

#### **A Gap in Literature Still Exists: A Scoping Review of the Impact of Video Gaming on the Development of Laparoscopic Surgical Skills**

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**Introduction:** Video games (VGs) are an emerging educational training modality. However, due to methodological differences in current literature, there is a paucity of consensus on VGs' impact in laparoscopic surgery (LS). This study explores peer-reviewed articles published in the last 10 years and provides insight to VG impact in LS skill development, both technical and non-technical.

**Methods:** A review adhering to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (PROSPERO ID: 275417) was performed, searching electronic bibliographic databases (Pubmed, Europe PMC, Scopus, Cochrane, Science Direct, CINAHL, Embase, ClinicalTrials.gov, Academic Search Complete, Gale One File, Epistemonikos, WorldCat, and MedRxiv) from January 1, 2010 to July 15, 2021. Articles detailing the use of VGs in the context of LS among surgical residents were included. Articles not written in English and articles without the specific gaming console (e.g. Nintendo DS, Playstation 2, Xbox 360, etc.) were excluded. Eligible studies were assessed using the Joanna Briggs Institute critical appraisal tools.

**Results:** A total of 1,375 study participants from 19 articles were included, the majority had no prior gaming experience (66%). Most studies focused on curriculum development (68%), teaching methods (53%), and utilized haptic technology (31%), virtual reality (21%), Nintendo Wii-U (32%), or Nintendo Wii (15%). The majority of studies focused on technical LS skills, such as objective completion time (68%), object positioning (32%), and object manipulation (42%). However, very few included non-technical LS skills such as motivation/engagement (16%), problem recognition and solving (5%), teamwork (5%), communication (5%). No study focused on the impact of VGs on resident's confidence during surgery, and none focused on patient safety.

**Conclusions:** Surgical education has primarily focused on technical skills and manual dexterity. However, there has been a lack of focus on teamwork and problem solving skills. Further studies are needed to explore the application of gaming on laparoscopic surgical training in regard to non-technical skills such as communication, teamwork, and motivation, as well as overall patient outcome.