O-05

Promoting Technology and Collaboration

Virtual Reality Simulators for Endoscopic Skills Acquisition: Evaluation of a Low-cost Plug-in Serious Game

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Background: Virtual reality simulators (VRS) are effective and are becoming standard for training endoscopic skills (ES). The available VRS are expensive, bulky and accessible only in dedicated training centers leading to underutilization. A low-cost portable VRS for ES acquisition could democratize access to training. To address this training gap, we developed "Rescue in the Deep" (RID) a lean, portable VRS for ES training. Our aim was to assess the efficacy of RID to acquire basic ES in novices.

Technology Overview: The RID simulator (Figure) is a low-cost USB plug-in device working with an installable software on a personal computer, integrating digital computation with real-time visualization. RID is a serious game featuring five levels of increasing difficulty, where players navigate and interact with a virtual underwater environment. The 3D-printed joystick, designed to replicate key functions of flexible endoscopes, houses sensors transmitting movements to a real-time physics simulation engine, enabling movement translation and interaction within the game. Scores are awarded for individual levels and for overall performance.

Potential Application in Surgical Simulation and Education: RID was compared to the GI Mentor Express VRS for ES acquisition in novices. Two groups of 10 novices each took the Fundamentals of Endoscopic Surgery (FES) exam before and after training on one of the VRSs. Both groups showed similar FES scores before and after training, indicating comparable progress regardless of which VRS was used. RID holds the potential to democratize endoscopic training due to its low cost, easy plug-in setup, and scalability through 3D printing production.

Potential Opportunities to Collaborate: The development of additional levels to encompass the full range of ES assessed in the FES exam could enhance RID's utility, encouraging adoption in educational institutions and individual learners. Collaborations with institutions could contribute to the democratization of endoscopic training, allowing access to a wider audience.

60

MAIN MISSION

Go through the 5 successive
blue hoops (5/5)

HEALTH

CABLE

60

03:59

SCORE

0

points

MAIN MISSION

Scan all 5 corals (5/5)

OXYGEN

HEALTH

CABLE

60

O₂

SCAN THE AREA

00:18

SCORE

0

points