

Using gamification for optimizing efficiency of microsurgical training in augmented reality

Marino MENOZZI¹, Sandro ROPELATO¹, Jana KÖFLER¹, Ying-Yin HUANG²

*¹ Human Factors Engineering, ETH Zürich
Scheuchzerstraße 7, CH-8902 Zürich*

*² VR/AR Manufacturing, Simulation, & Ergonomics Lab,
Dept. of Industrial Engineering and Management
National Taipei Univ. of Technology, TW-10608 Taipei, Taiwan*

Abstract. Simulators are a mean to overcome many constraints in microsurgical training, such as the need for material from human or animal cadaver, issues in standardization of training procedures, shortage of locations and temporal availability of training possibilities. In previous work (GfA 2019), we have described the development of a simulator for microsurgical training, which is based on augmented reality (AR). Furthermore, previous work reported on the efficiency and effectiveness of training when using our AR simulator for microsurgical training. In the developed AR training simulator, microsurgical performance is scored basically by considering the deviation of the tip of the microsurgical instrument from a given path. It is well known that efficiency of training depends on the motivation or on the flow experienced during training. In this work, we investigated whether efficiency of training with the AR simulator can further be improved by gamification. For this purpose, the AR simulator was equipped with a health bar, an online indicator of the distance of the tip of the microsurgical instrument from the ideal path. The effect of training with a health bar was investigated using 23 participants performing one training session with the health bar included and compare their training progress with the training progress recorded in a group of participants of a previous study (GfA 2019) taking the training without health bar. The progress in training performance of participants using the health bar turned out to be more important than in participants training without health bar. We therefore conclude that gamification is an effective means in microsurgical training.

Keywords: micros surgery, augmented reality, gamification, simulator, training, flow



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