

Chapter 12

Virtual Reality Applications as an Innovative Educational Practice in Adult Education: A Case Study on Training Hellenic Air Force Pilots

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ABSTRACT

Virtual reality educational applications are supporting educational systems to provide better and more realistic training. Military training systems have incorporated such applications in their training programs having positive results in terms of training outcomes, safety, and cost efficiency. The aim of the chapter is to present the benefits of using virtual reality applications in connection to the modern learning theories. More specifically, the chapter summarizes the concepts of experiential, active and constructive learning theories conjoining them with the results of a research conducted to the Hellenic Air Force training pilots concerning their virtual reality training via flight simulators. As derived from the research, virtual reality educational applications are very helpful as far as it concerns acquiring new knowledge, developing skills, with predominant flexibility in decision making and more effective task prioritization and changing trainees' attitudes at the level of self-confidence, understanding, and self-reflection.

INTRODUCTION

The technological evolution of the past decades could not leave the educational community unaffected, let alone Adult Education. Intelligent Tutoring Systems and educational applications of Virtual Reality (VR) have already in the past been adopted in formal, non-formal and informal education. A typical example is military educational systems, which allow for realistic training without putting human life at risk.. The educational outcomes of these applications appear more than promising when it comes to gaining new knowledge, developing new skills and changing the educational attitudes of the trainees (Mayrose, 2012; Pantelidis, 2009).

The purpose of this chapter is to provide insights of the educational potential and the characteristics of Virtual Reality applications in Adult Education. More specifically, the survey focuses on the training of Hellenic Air Force pilots, via Virtual Reality applications, such as Flight Simulators. Moreover, the research investigates the trainees' and trainers' views on key issues of VR education as well as on the requirements of a VR based educational environment in the context of proper function as a training tool and difficulties that may arise.

Although fighter pilots are definitely adult learners their training through VR applications stands closer to formal education as it is mandatory and very closely controlled. The first section of the chapter focuses on Adult Learners' characteristics associating them to the learning theories of experiential and constructive learning (Rogers, 1996) and the VR educational environment. In the second section of the chapter the results of an empirical research conducted in 2018 are presented. The research was carried out at the 120 Air Training Wing in Kalamata, Greece, during the period between February and March 2018, investigating the educational outcomes of the training through the implementation of a Virtual Reality application, the participants being the trainee pilots. For the collection and interpretation of the results, the use of convergent design of mixed research methods was chosen. Quantitative and qualitative data were collected at the same time from two different research tools: a quantitative data questionnaire and face-to-face interviews.

The results of the research reveal that training through Virtual Reality offers the trainees the advantage to gain new knowledge, to develop new skills, with predominant flexibility in decision-making and more effective task prioritization and, finally, to change their attitude at the level of self-confidence, understanding and self-reflection. According to the participants' views, the benefits of using Virtual Reality as an educational tool in the field of Adult Education are important and have, mostly, to do with decoding some obscure concepts of theory, making education more attractive and improving understanding of inaccessible or tricky mechanical systems. The ability to practice in environments or situations that are difficult or dangerous to deal with in real conditions and the serious cost reduction have been also highly appreciated.

Furthermore, this chapter points out the limitations that may arise and the prerequisites that should be established, so that VR applications could be developed and implemented according to the specific needs of each educational domain, being military training or university education.

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