Virtual Reality and Augmented Reality in Training: A Systematic Review of the Literature

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Training is one of the most important and effective way to engage employees. In a virtual world using different scenarios and job challenges, Virtual Reality (VR) can help business to save money and time. Nowadays in the Training area we can see that Virtual Reality and Augmented Reality have taken a huge step specifically in Industry (Goulding, Nadim, Petridis, & Alshawi, 2012).

In the perspective of Petrock (2017), VR is a method of training that can provide a safe, cost-effective environment and offer a measurable improvement in the immersive learning outcomes. They are also two technologies that are slowly finding their way into all areas of business, including in Human Resources Management and Development (HRMD).

Such technologies can have a great impact in several HRMD areas, such as in the training of new employees and in the development of new skills, revolutionizing the way companies provide employees with learning experiences which help them to acquire knowledge, skills and achieve performance goals (Petrock, 2017).

The term "soft skills" is applied to skills which are needed for effective social interactions, including customer service, negotiating, sales pitching and business networking. These enterprise skills are essential for the effective functioning of businesses and are what managers are looking for from prospective employees. With automation increasing, being proficient in these skills is necessary. A study by Manyika et al. (2017) for McKinsey estimates that up to 30% of the hours worked globally could be automated by

2030 and it is the uniquely human skills, which will become ever more valuable in years to come.

VR provides an affordable, scalable and measurable way for companies to train employees in the transferable skills they need to operate a successful organization.

Until now, soft skills have usually been learned on the job, through interactions with colleagues, clients and other stakeholders and it has been difficult to measure progression.

Practising soft skills in VR can provide the authentic experience needed to develop these skills, especially when traditional learning methods have been too difficult, or unsuitable (Pan et al., 2006). This is because VR creates a strong sense of presence and immersion (Bailenson ,2018) due to the fact that it provides realistic, multi-sensory and interesting experiences that traditional teaching methods cannot replicate (Hill and Smith, 2005). When those learning are able to continually practise real-world situations, in the safety of the virtual world, they can learn through experience and more easily apply their learning to the workplace.

Currently, almost every single organization is highly dependent on well-trained members, polishing skills on real-life problems on a daily basis. Even though all the technical innovation, training is fundamental to professional valuation. At this particular area is where VR and AR training might truly succeed - not only it can cut out distractions, but it can effectively immerse the trainee into the simulation, to the point where they begin to respond to it just as they would in a real-life situation.

This research aims to be an input in the potential application of VR and AR in the training area, filling the gap and exploring the application on this process. It also pretends through a systematic review of scientific literature, map the state of art and look forward in the potentialities of VR and HR in HRMD. According to David Denyer and David Tranfield (2009), a systematic review is a methodology that helps to identify the existing studies and allows to deduce conclusions in a clear way about what is and is not known. This systematic review was conducted on scientific databases using defined Keywords and expressions related with the area (training). To improve the quality of this study numerous filters were used to increase the quality and importance of the results.

To collect a relevant number of outputs the next step was to analyse the results and in order to reduce or eliminate based decisions, the study was undertaken by two more members, with specific keywords and pre-defined criteria's: Year (2013-2018); Languages (English, Portuguese, Spanish and French); Full text; Replicated articles and study object. The final list of included outputs where 49 articles and papers.

The results are presented in a set of categories nominated as: (1) Topic of the study; (2) Method used; (3) Type of study; (4) Technological resources used; (5) Activity sector of the study; (6) Participants in the study and (7) impact.

The present analysis reveal that the majority of published researches are on Industry and Health, where 63% is focused specifically on health and 28% is focused on the industry sector.

Results from the previous analysis showed that a specific use for development of proceedings and technical skills are mostly used in health, whereas in the industry sector the focuses is in the use of these training technologies for the security of employees.

Keywords

Human Resources Management; Human Resources Development; Virtual Reality; Augmented Reality; Systematic Literature Review, Training

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