TRAINING AND REHABILITATION: THE CONTINUING GROWTH OF VIRTUAL REALITY IN SECURITY

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Virtual Reality (VR) has started to play an increasingly important role in various areas of human life. In the field of security, health, education, but also as a diagnostic, therapeutic and rehabilitation tool (Radianti et al, 2020: 2).

In Europe in particular, **investment** in the field of VR and Augmented Reality (AR) has **increased** from 672 million euros in 2015 to 14,770 million euros in 2020 (Bezegová, 2017:14). The main **areas of application** in Europe are entertainment and games, simulation and training for professional and industry use, healthcare, real estate and architecture. The European VR and AR research scene is concentrated in France (especially Paris and Laval), in the United Kingdom (University of London and the University of Manchester) and in Germany (Berlin and Munich). Spain (Barcelona), Sweden (Stockholm), Austria, Italy and Greece are also engaged in virtual research (Bazegovà, 2017: 25).

In this article, the **benefits** of Virtual Reality in the **security sector** will be examined, specifically exploring its use and potential in **training** and **rehabilitation** through the analysis of two case studies: The VR training prototype developed by REX TE.CH S.A. in collaboration with Agenfor International and the pilot on prison rehabilitation called "Smart Prison Project" implemented by the Criminal Sanctions Agency.

THE BENEFITS OF BLENDED VIRTUAL REALITY FOR SECURITY AND JUSTICE TRAINING: THE EXPERIENCE OF MAGIC OWL

With regard to training, Agenfor International and the private enterprise REXTECH S.A. recently developed a **VR prototype** to train Law Enforcement Agencies (LEAs) in radicalisation, prevention and digital forensics in prison, through the creation of scenarios in virtual environments to enable the strengthening of counter-terrorism agents' and prison staff's capacity in both **decision-making** and **emotional skills**. The training course is divided into **three modules**: one on radicalisation in prison, one

on data collection, and one on digital forensics. In practice, participants are teleported into a virtual prison and are asked to move through various prison environments, engaging in interactives games to gain knowledge on the signs and pathways of radicalisation, as well as understanding of the procedures of data collection and forensics extractions (Bianchi, 2020).

The methodology used, referred to as the "**VR Blended Solution**", was designed and developed to supplement more traditional ways of teaching and learning though allowing the user to experience an immerse "**learning by doing**" approach (Tubul-Lavy, Bianchi, 2020). The methodology combines **five training methods**, namely: Immersive Virtual Reality training (immersive and interactive technology, both multi and single player); 360-degree immersive learning environment (not interactive but immersive); serious gaming (targeting enhanced participant focus and simulation); synchronic and a-synchronic online delivery (via the "Hermes" platform); traditional face-to-face classes (Bianchi, 2020).

The above-mentioned 'immersive solutions' warrant further exploration: users are completely immersed in VR, so much so that they can touch and grasp virtual objects, interact with each other and move as in reality. Indeed, as pointed out by James et al. (2020), the active role of the user allows him/her to engage in those learning scenarios as an operational subject, enabling the development of exploration-based learning paradigms. Through this methodology, it is possible, at the same time, to train the users in this procedure, but also to improve the VR system on the basis of the actions taken by the users during the simulation. The associated technique called "**serious gaming**" is key to the results of the learning experience and is a useful tool for mixing interactive games with real educational purposes: this technique has been shown to increase users' attention and ability by improving their involvement and engagement and, at the same time, increasing the pleasure of the learning processes.

An example of the use of such a technique by LEAs can be taken

from the University of Applied Sciences for Public Service in Bavaria, Police Department, who tested the VR course within the framework of the <u>European project J-SAFE</u>.

As pointed out by Max Hausner (2020), Project Manager at the University of Applied Sciences for Public Service in Bavaria - such activities, ranging from prison research to simulations of risk situations, have many **advantages**, in particular: less need for professional trainers, the possibility to involve more experts, cost savings, immersion in areas otherwise unavailable, better comprehensibility and learning effect through visualisation and immersion, increased attention and willingness to learn through the aforementioned serious gaming.

VIRTUAL REALITY IN REHABILITATION: CRIMINAL SANCTIONS AGENCY

In the field of rehabilitation, a particularly interesting example can be found in the project developed by the Criminal Sanctions Agency in collaboration with the University of Tampere and the Finnish penitentiary system aimed to introduce Virtual Reality to inmates, using technology to teleport them to external environments - be it the forest, a park or a city - or to allow them to live certain experiences in these virtual environments, which can develop stimuli such as **motivation**, **well-being**, but also **challenge**. By doing so, the pilot project tested the extent to which Virtual Reality can be used to help inmates during their imprisonment, decreasing feelings of isolation, depression, or anger and, at the same time, avoiding any detachment from reality that often happen when in prison.

So far, the piloting test involved the use of VR environments in three Finnish prisons, the first of which was the prison of Turku, and included the assistance of a psychologist and supporting staff for some of the inmates who were found to be mostly affected by feelings such as anxiety, depression or aggressive attitudes. Preliminary results were **positive**, as inmates reported

positive responses to the Virtual Reality simulations. As Poulakka (2020) states, for some, Virtual Reality represented "an alternative to prison reality, an opportunity to try and learn new things, a support for well-being and relaxation and a way to cope with difficult situations" (Poulakka, 2020).

According to one of the Project's Developers, Pia Poulakka (2020), the pilot should also be tested in one Finnish female prison in 2021, which would allow for a better evaluation of the technology and, consequently, its improvement, so that it can be used for **rehabilitation purposes** for those who are isolated, anxious, depressed, irritated or otherwise psychologically challenged prisoners.

CONCLUSION

As demonstrated in this article, VR tools have brought numerous benefits, such as allowing end-users to achieve a high level of situational awareness and enabling information assimilation that exceeds normal training experiences. They have also enabled new opportunities for group collaboration, interactivity between participants and full immersive experiences in critical environments, where participants can study and analyse situations and find innovative solutions.

Preliminary results concerning the application of VR in the fields of training and rehabilitation seem to be promising. Considering the current situation characterised by low mobility due to COVID-19, in the future will be crucial to allocate funds to enable the full implementation and further development of the various initiatives using VR technologies.

REFERENCE LIST

Bianchi, S. (2020, December 9). The Benefits of Blended Virtual Reality for Security and Justice Trainings [PowerPoint slides]. Agenfor International, Italy: J-SAFE project funded under the European Union's JUST-AG GA No. 763714. Retrieved from: https://jsafeproject.eu/webinars/.

Bianchi, S. (2020). Virtual Reality Training Products [PowerPoint slides]. Agenfor International, Italy: J-SAFE project funded under the European Union's JUST-AG GA No. 763714. Retrieved from: https://jsafeproject.eu/webinars/.

Dorozhkin, S., Vance, J., Rehn, D., Lemessi, M. (2012). Coupling of interactive manufacturing operations simulation and immersive virtual reality. *Virtual Reality,* 16, 15-23. Retrieved from: https://doi.org/10.1007/s10055-010-0165-7.

Hausner, M. (2020). Benefits & Impact of VR training for Law Enforcement Agencies [PowerPoint slides]. University of Applied Sciences for Public Administration and Legal Affairs in Bavaria, Germany: J-SAFE project funded under the European Union's JUST-AG GA No. 763714. Retrieved from: https://jsafeproject.eu/webinars/.

Karapatakis, D. (2020). Virtual Reality, A Presentation for J-SAFE and beyond: a European Prospective [PowerPoint slides]. Center for Security Studies, Greece: J-SAFE project funded under the European Union's JUST-AG GA No. 763714. Retrieved from: https://jsafeproject.eu/webinars/.

Lavy, Z.T., Bianchi, S. (November, 2020). Adopting Virtual Reality: Can we all benefit from superpowers? Agenformedia.com Retrieved from: https://www.agenformedia.com/publication/adopting-virtual-reality-can-we-all-benefit-from-superpowers/.

Poulakka, P. (2020). Virtual Reality in Rehabilitation [PowerPoint slides]. Criminal Sanctions Agency and University of Tampere, Finland: J-SAFE project funded under the European Union's JUST-AG GA No. 763714. Retrieved from: https://jsafeproject.eu/webinars/.

Radianti, J., Majchrzak, T.A., Fromm, J., Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education. *Computers & Education*, 147. https://doi.org/10.1016/j.compedu.2019.103778.

European Commission (2019). Extended Reality for All. *CORDIS*. https://cordis.europa.eu/project/id/825545/it.

Bezegová, E. Ledgard, M. Oberč, B. Vigkos, A. (2017). *Virtual Reality and its potential in Europe*. Ecorys.

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