EUROPEAN AUGMENTED REALITY TRAINING NEEDS

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Abstract

The report of AROMA project (AROMA project consortium, 2018) summarizes a detailed study performed within project partner countries (Belgium, Czech Republic, Greece, Malta, Romania, Spain and Sweden) aimed at identifying the training needs connected with augmented reality technology (AR) and entrepreneurial skills and mapping an awareness about the AR technology. For the project, the research also serves as a first step to identify gaps that need to be addressed to offer a holistic syllabus integrating AR with selected skills and competencies.
Keywords: *augmented reality, competencies for entrepreneurship, vocational education and training.*

Introduction

The Erasmus+ KA2 AROMA project (Digital Training Toolbox for Entrepreneurial Training in Augmented Reality, No. 2017-1-CZ01-KA202-035560) is motivated by the EU's Entrepreneurship 2020 Action Plan. The digital world is developing novel technologies that can offer a range of opportunities for businesses in the knowledge-based economy and also for education. These trends reflect a need that vocational education (VET) training in appropriate skills should also focus on exploiting digital technologies to help foster new business opportunities and raise general awareness about the potential of some digital technologies, namely the AR, which can help to enhance key competencies such as digital skills, entrepreneurship, lifelong learning, decision making etc. The AR technology itself has a potential that can be exploited in various fields and many training and educational activities – see also e.g. (Akçayır & Akçayır, 2017; Chang & Hwang, 2018; Chen, & Wang, 2015; Ibáñez & Delgado-Kloos, 2018; Chen & Wang, 2015; Lamanauskas, 2008; Lincoln, 2018; Yip, et al., 2018). Therefore, it can be interesting and important to map the overall awareness about the technology among VET trainers, its possible exploitation for the training in various contexts and if or how it could help to develop some selected competencies closely connected with entrepreneurship.

Research Methodology

The survey had two essential parts. The first one was an online anonymous questionnaire including 15 questions grouped into 3 sections: respondent background, knowledge of the AR technology and evaluation of the importance of the EU key competencies and skills to develop entrepreneurship (European Commission, 2017). The

aim was to reach a wide spectrum of respondents from VET trainers to entrepreneurs and stakeholders with various fields of their specialisations. Totally, answers from 322 respondents have been collected. The second part of the survey consisted from 31 deep interviews gaining the views, experience and opinions of 19 VET trainers and also some engineers, entrepreneurs, personnel agency specialists, an ICT specialist and an international relations specialist. The questionnaire was evaluated through a spreadsheet with graphs for most survey items. All the interviews were transcript into the report (AROMA project consortium, 2018), in which only the country, the gender and professional background of the respondent are noted. Then, the common and overall views and suggestions were summarized.

Research Results

Among the EU competencies most appreciated were digital skills, learning to learn (willing to learn) and creativity (see Figure 1). In connection with the competencies to promote entrepreneurship (Figure 2), some respondents pointed out that all are important and each of the selected competencies should be developed at some minimal level. The main obstacles for more extensive employing of the AR in training and education were the money (needed for hardware like glasses as well as for the software and experts developing the AR content). Also, it was pointed out the importance to keep the courses updated and follow the fast development of technology. As many teachers and trainers prefer to create the course materials themselves, it is crucial to train them and provide them with suitable motivating support to overcome starting difficulties when they make the first acquaintance with some technical details.

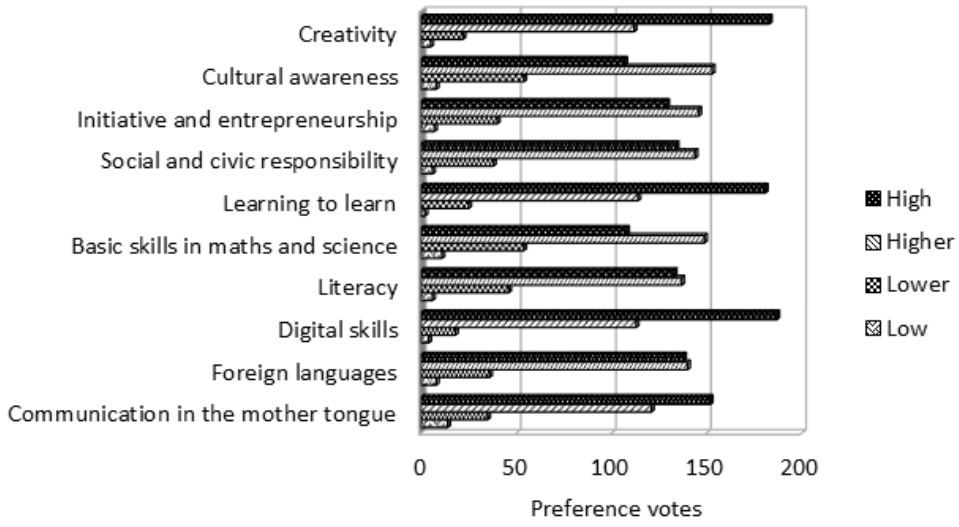

Figure 1. The importance of the EU key competencies.

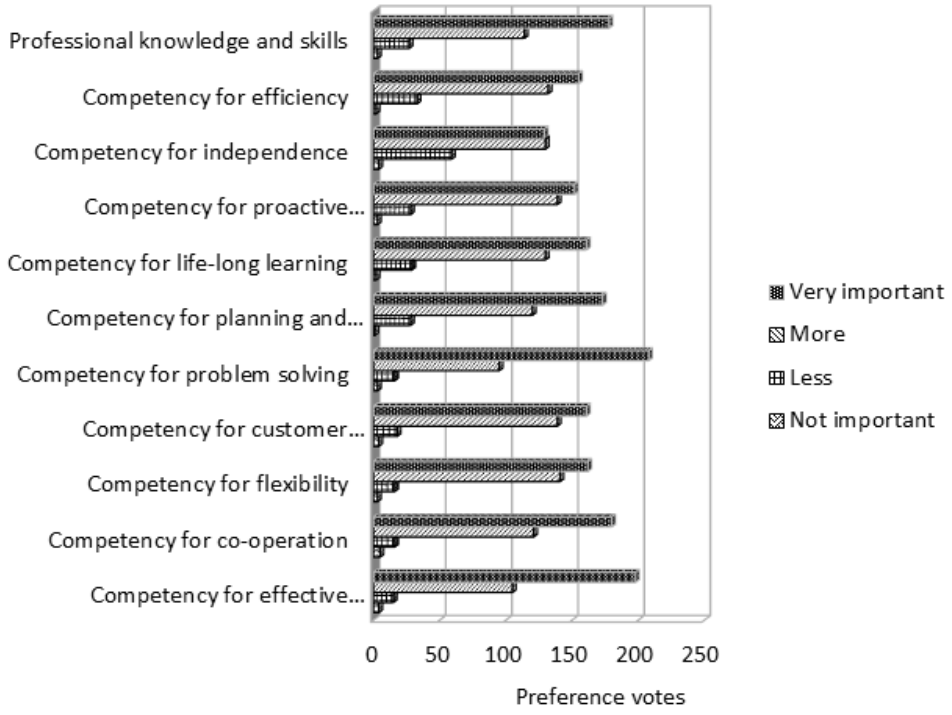

Figure 2. Importance of selected competencies to develop entrepreneurship

Conclusions

Though the AR technology gradually finds its way into business, education and common life, it can be still considered relatively unknown. Our respondents expect, that AR technology could accelerate training, increase its efficiency, make learning and training more dynamic and enabling to solve some problems faster. The most promising and effective ways how to promote the AR technology are sharing information online (e.g. via social media) and by presenting the best examples of how to use it profitably in practice. The training of teachers is very important for larger exploitation of the AR technology in education. Our survey also confirms the general importance of the key EU competencies and the selected competencies to develop entrepreneurship.

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References

Akçayır, M., & Akçayır, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educational Research Review*, *20*, 1–11. doi: 10.1016/j.edurev.2016.11.002.

AROMA project consortium (2018). *Status & Foresight Report of European Augmented Reality Training Needs*. Retrieved from: https://sites.google.com/view/ka2project/home.

Chang, S.-C., & Hwang, G.-J. (2018). Impacts of an augmented reality-based flipped learning guiding approach on students' scientific project performance and perceptions. *Computers & Education*, *125*, 226–239. doi: 10.1016/j.compedu.2018.06.007.

Chen, C., & Wang, C.-H. (2015). Employing augmented-reality-embedded instruction to disperse the imparities of individual differences in earth science learning. *Journal of Science Education and Technology*, 1–13. doi: 10.1007/s10956-015-9567-3.

Chiu, J. L., DeJaegher, C. J., & Chao, J. (2015). The effects of augmented virtual science laboratories on middle school students' understanding of gas properties. *Computers & Education*, *85*, 59–73. doi: 10.1016/j.compedu.2015.02.007.

European Commission (2017). *Developing key competencies for all throughout life*. Retrieved from: https://ec.europa.eu/education/sites/education/files/document-library-docs/fact-sheet-key-competences-lifelong-learning_en.pdf.

Ibáñez, M.-B., & Delgado-Kloos, C. (2018). Augmented reality for STEM learning: A systematic review. *Computers & Education*, *123*, 109–123. doi: 10.1016/j.compedu.2018.05.002.

Lamanauskas, V. (2008). The augmented reality teaching / learning platform: Some implications for the present and future. In.: *Information and Communication Technology in Natural Science Education-2008* (Proceedings of International Scientific Conference, 28-29 November 2008) (pp. 5-7). Siauliai: Siauliai University Press.

Lincoln, J. (2018). Augmented reality Moon for astronomy lessons. *The Physics Teacher*, *56*(7), 492–493. doi: 10.1119/1.5055344.

Yip, J. et al. (2018). Improving quality of teaching and learning in classes by using augmented reality video. *Computers & Education*. doi: 10.1016/j.compedu.2018.09.014.