

Section 3

Chapter 12 - Assessment in Videogames and Educational Apps Based Learning in Upper Secondary and Post Secondary Non-Tertiary Education

Case Scenario 2

Title: **Simulation game for technical training as alternative for learning using real and expensive equipment**

Description:

Technical drivers that operate cranes and industrial robots have to get operational experience during their training in vocational education institution. Such learning is only possible if students have a chance to use a real machines to practice. However, cranes and robots are expensive technical equipment, that schools have limited access to. Also any learning error and failure has a big costs for maintaining the equipment. The learning situations are also limited to the physical location where the equipment is present, reducing the complexity of real life situations.

In such learning situations technical computer based simulation can be very beneficial. Technical crane and robot simulations vary and can be played purely on personal computer, or personal computer with extended controllers. Even the virtual reality simulations that create immersive experience are emerging in the field of operating technical transport. The pros of such technologies are that they are easier to scale for larger student groups than real equipment. Also multiple types of transport could be explored in various situations and challenges, that are usually very limited in training with real machines. Virtual extensions that simulate real controllers are impossible to spoil thus the risk of damaging the equipment is minimal. Students are usually eager to participate and have realistic experiences, thus the engagement and hand on experience is increased.



On the other hand such tools require a specific digital equipment as computers, simulation controllers (keyboards, joysticks etc.), virtual reality headsets, and teacher preparation to use the tools and navigate learning process. Virtual reality headsets are still quite expensive limiting school to access to only a few of them. However, mobile virtual reality applications are expanding and may be sufficient for some type of technical simulations, allowing the school to purchase cheap VR head mounts that use smartphone as a source for the content.

Regarding the student assessment, simulations as every computer bases learning system and game will track player actions and achievements, giving teacher insights about the learning process and ability to use simulation to assess the students level of expertise using the equipment, before going to the actual machines.

When establishing a simulation lab for technical drivers it is good to start with existing simulations available for purchase that require minimal additions to usual computer classroom, with possible extension for virtual reality setting. Also, there are possibilities to collaborate with universities that are developing simulation software and share the needs that students are facing, shaping the solution and having the access to test it.