I.R. de Boer
Ilse R. de Boer, PhD student at ACTA, UvA

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Supervisor: Prof. P.R. Wesselink PhD
Second supervisor: J.M. Vervoorn PhD

Title:
VR as innovation in dental education.
Validation of a virtual reality environment: collecting evidence 'on-the-fly' during development and implementation

Within the dental curriculum there is an increasing need to solve scarcity in educational materials, such as extracted human teeth with the appropriate pathology and patients with dental treatment needs that match the students’ practicing goals to graduate as a competent dentist. A solution to aforementioned challenges has been sought in Virtual Reality and thus an innovation process has begun. With the development of the Moog Simodont dental trainer, a technological innovation for dental education was introduced. This dental trainer is a virtual reality learning environment in which the user is fully emerged into the virtual world enabling treatment of virtual patients and the performance of manual dexterity exercises. This thesis describes the creation and appreciation of the developed virtual teeth for use in the Simodont dental trainer to enable treatment of virtual patients. Additionally, it describes the evaluation and validation of assumptions made prior to the development of the Simodont dental trainer. Evaluation of the performance and user preferences revealed that three-dimensional vision has significant positive effects on performance and was identified as highly preferable among students compared to two-dimensional vision. Also the presence of force feedback in the dental trainer appears necessary to be able to perform an assignment that requires fine motor skills. Finally, the ‘on-the-fly’ approach which was used to create the above mentioned evidence, describes the process of innovation, implementation and collection of scientific evidence in an academic environment, during an ongoing curriculum.