VIRTUAL REALITY FOR YOUNG CONSTRUCTION WORKERS INSTRUCTION AND TRAINING

Arcangeli G. - Istituto di Medicina del Lavoro -Università di Firenze, Largo Palagi 1, 50139 – Fi - +39 554278259 / argiulio@flownet.it
Del Bimbo A., Vicario E., Assfalg. J. - Dipartimento di Sistemi e Informatica - Università di Firenze - +39 55 4796262 /delbimbo@dsi.unifi.it
Bagnara S., Mariani M., Parlangeli O. - Laboratorio Multimediale - Università di Siena – bagnara@unisi.it
Tartaglia R. - Dipartimento di Prevenzione - Azienda Sanitaria di Firenze - +39 55 6263775 / ritarta@tin.it

CRE - Centro di Ricerche in Ergonomia -Dipartimento di Prevenzione - Azienda Sanitaria di Firenze - +39 55 6263775
diparprevfi@ftbcc.it

ABSTRACT

Falls from scaffolds are one of the most frequent causes of fatal or serious injuries in building and construction setting. To prevent such injuries, the availability of effective education and training methods and tools is of paramount importance. The one-year long EU (SAFE) project Vecwit (Virtual Environment for Construction Workers Training and Instruction) has been conceived to set up a virtual reality (VR) environment that shall serve as an educational tool for construction workers' education and training. Specifically, the project had two main goals: to improve trainees' risk perception and expertise on safe behaviours while working on scaffolds. The project foresaw four different steps. First, a preliminary definition of the technological platform was made. Second, task analysis was performed to get a model of the more risk situations and define the scenarios to be implemented. Third, a VR prototype with the system's main features was developed. Finally, an ergonomic study was designed to evaluate both system's usability and training effectiveness. The study involved two groups of eight young workers (novices and already experienced ones) who had to perform the following tasks:

- filling in a pre-test questionnaire. Such a questionnaire was devised for assessing familiarity and attitude toward VR systems;
- task oriented exploration of the VR prototype. The exploration took place in presence of an experimenter who took note of the user's errors and other problems of interaction (e. g. get lost in virtual space)with the system;

- filling in a post-test questionnaire. Such questionnaire was made up of multiple choice questions for the assessment of training goals (improvement of trainees' risk perception and expertise on safe behaviours).

The ergonomic study resulted in a number of findings related to educational effectiveness and specific usability problems related to VR systems.