

Non-Cognitive Skills Associated with Learning in a Serious Gaming Environment: A Pretest-Posttest Experimental Design

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Abstract : Lifelong learning is increasingly seen as essential for coping with the rapidly changing work environment. To this end, serious games can provide convenient and straightforward access to complex knowledge for all age groups. However, learning achievements depend largely on a learner's non-cognitive skill disposition (e.g., motivation, self-belief, playfulness, and openness). With the aim of combining the fields of serious games and non-cognitive skills, this research focuses in particular on the use of a business simulation, which conveys change management insights. Business simulations are a subset of serious games and are perceived as a non-traditional learning method. The presented objectives of this work are versatile: (1) developing a scale, which measures learners' knowledge and skills level before and after a business simulation was played, (2) investigating the influence of non-cognitive skills on learning in this business simulation environment and (3) exploring the moderating role of team preference in this type of learning setting. First, expert interviews have been conducted to develop an appropriate measure for learners' skills and knowledge assessment. A pretest-posttest experimental design with German management students was implemented to approach the remaining objectives. By using the newly developed, reliable measure, it was found that students' skills and knowledge state were higher after the simulation had been played, compared to before. A hierarchical regression analysis revealed two positive predictors for this outcome: motivation and self-esteem. Unexpectedly, playfulness had a negative impact. Team preference strengthened the link between grit and playfulness, respectively, and learners' skills and knowledge state after completing the business simulation. Overall, the data underlined the potential of business simulations to improve learners' skills and knowledge state. In addition, motivational factors were found as predictors for benefitting most from the applied business simulation. Recommendations are provided for how pedagogues can use these findings.

Keywords : business simulations, change management, (experiential) learning, non-cognitive skills, serious games

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