A Novel Videogame Platform for Studying Teams: Training and Predicting Role Comprehension Using Artemis

Erin D. Long
University of South Florida, erinlong1@verizon.net

Galo Rodriguez
University of South Florida, grodriguez3@mail.usf.edu

Nirma Kumarasiri
University of South Florida, nirma@mail.usf.edu

Keaton A. Fletcher
University of South Florida, fletcherk@mail.usf.edu

P. Scott Ramsay
University of South Florida, psramsay@mail.usf.edu

See next page for additional authors

Presenter Information

Erin D. Long, Galo Rodriguez, Nirma Kumarasiri, Keaton A. Fletcher, P. Scott Ramsay, and Wendy L. Bedwell Ph.d

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P. Scott Ramsay, & Wendy L. Bedwell, Ph.D.

University of South Florida

Abstract

We examine the utility of a platform training initiative (based on the science of training – information, demonstration, practice, and feedback) for developing transactive memory (TMS) within an ad hoc team, focusing on comprehension of one's own role and the duties of the remaining team roles. Teams consisted of four roles: Helm, Weapons, Engineering, and Science/Communication. Helm maneuvered the ship, Weapons attacked enemies, Engineering allocated power to maximize team efficiency, and Science/Communications identified/communicated with external entities.

Participants were randomly assigned to roles and received role specific training as well as training on teammate roles. Cognitive ability, industriousness, and video game self-efficacy (VGSE) were measured pre-training, while subjective and objective role understanding were measured post-training. We conducted four hierarchical linear regressions to identify predictors of role comprehension. After accounting for cognitive ability, industriousness, and VGSE (R^2_{Helm} = .11; R^2_{Weapon} = .08; $R^2_{Engineering}$ = .29; $R^2_{SciComm}$ = .19) role training accounted for additional significant variance (ΔR^2_{Helm} = .06; ΔR^2_{Weapon} = .05; $\Delta R^2_{Engineering}$ = .04; $\Delta R^2_{SciComm}$ = .05). After controlling for the effects of cognitive ability, industriousness, and VGSE, role training predicted one's ability to identify teammate responsibilities, except weapons (ΔR^2_{Helm} = .08; $\Delta R^2_{Engineering}$ = .03; $\Delta R^2_{SciComm}$ = .07). Given the overall high ability to identify responsibilities of each role, our results suggest that role training based on the science of training helped rapidly create TMS, with experts who understand their own role yet still know who is responsible for what action.