*Examining the Effects of Narrative on Learning and Cognition in Video Games*

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Abstract

This presentation describes research being conducted at the University of Central Florida to investigate the effects of a strong and compelling narrative on a player’s capacity for learning within a virtual environment. Theorist such as Jerome Bruner have argued that narrative provides the basic structure underlying processes of thinking and reasoning, and that the presence of narrative can help facilitate new learning.1 We are investigating whether or not the hypothesized relationship between learning and narrative can be leveraged to improve the design of video games intended to help people learn. To conduct this investigation we have created a set of custom tasks and puzzles utilizing the level creation tools of the game *Spore: Galactic Adventures*. Participants in this study will be invited to play one of two geographically identical levels with the same quest goals and some key visual monuments. In one of the game levels all tasks and puzzles are presented to players within an all-encompassing narrative, while in the other level the quests are defined through purely instructional means (i.e., do this task, now do this, etc.). The narrative version includes a small prologue and epilogue, named non-player characters, extended “framing” of questions that correspond to the story, and music that relates to events within the narrative. The story stresses player importance in the sense that the subjects are placed in a scenario where they are summoned as the key to rescuing a civilization and saving a deteriorating environment from a variety of antagonistic forces. In order to examine the effects of including a strong narrative on learning and engagement, we are applying numerous measures before, during, and after the participant plays the game. A pre-questionnaire collects general data about the participant such as basic demographic info as well as their gaming interests and experience. A post-questionnaire and assessment asks the participant to recall events and characteristics of the gaming environment such the shape, color, and location of virtual objects. The post-questionnaire also asks the participant to reflect on their emotional state while playing the game with questions about their self-efficacy as well as a set of questions about their sense of presence adapted from the instrument developed by Witmer and Singer.2 Visual recall is also measured through the analysis of the subject’s hand-drawn representation of the virtual experience. Finally, a participant’s arousal and engagement level is being assessed by collecting skin conductance data while they are playing the game. These same measures were used in a previous study that found that when participants played the game with an avatar they created, it led to increased engagement and an elevated sense of presence. The hypothesis in the current study is that engagement will be higher for participants who played the version with the strong narrative, and that this higher level of engagement will correlate with elevated learning outcomes. Results of this study will be presented along with implications for the design of virtual environments for education and training.

1. Jerome Bruner, "The Narrative Construction of Reality," *Critical Inquiry* 18 (1991): 1-21.

2. Bob G. Witmer & Michael J. Singer, "Measuring Presence in Virtual Environments: A Presence Questionnaire" *Presence* 7, no. 3 (1998): 228-233.