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Demonstration and Discussion of a 3D Online Learning Environment for Literacy

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Abstract: This session will demonstrate Chalk House, an online computer-based 3D environment in which game play and engaging narrative are used to improve student literacy skills, namely reading and writing, are the key focus of learning. Chalk House overlays learning tasks on top of game tasks such that students completing tasks in the environment are focused on formal learning requirements. Student activity ties directly to Texas, Indiana, and MCREL standards, as well as technology skills from the ISTE NETS-S standards.

Introduction

Chalk House, the first in a series of situated learning modules being developed as a collaboration between Created Realities Group and the Design+Research Collective, is an online computer-based 3D environment in which game play and engaging narrative are used to improve student literacy skills, namely reading and writing, are the key focus of learning. Chalk House uses the CRG 3D online learning environment (framework) to deliver this learning module. The current version of Chalk House is focused on middle school students, ages 10-14, who commonly resist traditional reading and writing activities in the classroom (Goldberg, Russell, & Cook, 2003; Marshall, 2002). This session will demonstrate the software and provide information on current activities and classroom trials underway.

3D On-Line Learning Environments

A 3D online learning environment provides a way to create Internet resources that are stimulating, appealing, easy to use, and educationally sound, without the need to develop highly elaborate technical skills (University of Sheffield, 2004). A 3D environment creates a context or scaffolding for interaction using 3D presentations to engage and/or immerse the student into a situation for learning (situated learning) or entertainment (Jones & Bronack, 2006). This type of interface has strong ties to their text-based cousins, dating back to the 1980's (Holmevik & Haynes, 2000), but now provide highly collaborative, immersive environments that promote interactions among students and with the instructor. As computer performance on low-cost personal computers increases, these types of systems allow teachers to provide students with unique online collaborative learning opportunities in the areas of language, science, computer graphics, and other fields (Chen, Toh, & Fauzy, 2004; Jones, 2003).

In a shared 3D environment, such as a school building, park, or museum, users assume control of an avatar, or virtual-self. Communication occurs via text, full-duplex audio, overheads, whiteboard, and other collaborative tools. Students and instructors use different tools depending on their tasks and preferences. 3D online learning environments facilitate multimodal communicative interactions; therefore, increasing the likelihood that all students, regardless of learning styles, can maintain equal opportunity to generate constructive rapport.

Students and teachers frequently comment that they feel more engaged when interacting with one another within 3D virtual environments (Jones, Morales, & Knezek, 2005). Users must take control in order to interact and move in the environment. Such interaction leads to immersion (Jenson, 2002). In other words, walking within the

environment, and when possible talking with other users, provides the most effective means of gaining situational awareness (Prinz et al., 2004).

The Created Realities framework takes current off-the-shelf commercial approaches that provide contextually accurate software-derived 3D environments and then overlay collaborative groupware, unified communications, and other instructional tools to create a single distance/distributed educational delivery interface. The use of state-of-the-art real-time rendering on consumer PC platforms allows students and instructors to have a 'lean-forward' (engaged) seamless peer-to-peer educational experience (CRG, 2005).

Chalk House and Literacy

Chalk House combines the advantages of hypertext, leverages student's existing use of word processors, and the motivating power of 3D environments and pedagogical/intelligent agents to provide students with a safe, engaging learning space to practice writing and develop their reading skills. Student activity currently ties directly to Texas, Indiana, and MCREL standards, as well as technology skills from the ISTE NETS-S standards. Feedback according to rubrics provides students feedback for improving their writing skills. They take tests and quizzes in the system as part of the role-play experience. These assessments examine the degree of comprehension and recall that students achieve as part of their reading activity in the 3D learning environment.

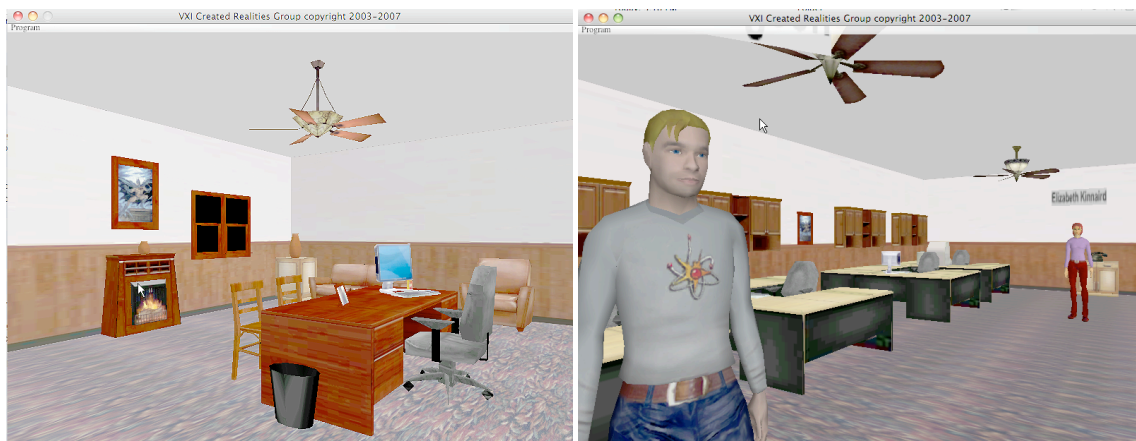


Figure 1 – Two screenshots from the Chalk House Newsroom.

Chalk House overlays learning tasks on top of game tasks such that students completing tasks in the environment are focused on formal learning requirements. This is accomplished by breaking the interaction into different levels that initially frame the learner's entire task, then drop down to build from low to highly cognitively challenging tasks. At the Top Level, the Chapter is the overall local story and problem (from Problem Based Learning) that the learner will be dealing with and attempts to narrate, solve, and move through linearly in order to complete the required news stories. The next level, the Investigation level, the student is tasked with gathering the information necessary for the Chapter. Each Investigation level has a number of completion tasks (lowest level), that has the student write, read, or develop other requirements necessary for building formal literacy competencies.

Within the story, students play the role of reporters who must retell both the stories of the characters they encounter as well as their own story that unfolds as they complete linked reading and writing tasks that emerge in the form of puzzles, clue deciphering, and newspaper reports that they develop in order to earn points in the form of Cash that allow them to advance through the game and Prestige that functions as experience points towards improving learner standing and access to locations within the game environment.

To complete the learning tasks, students must tell the stories in their own words on which they receive feedback from experts in the form of pedagogical agent (Baylor & Kim, 2005) characters such as the Copy Editor,

who will comment on their use of vocabulary within their written piece as well as their and depth of comprehension of text passages. These passages are encountered in the form of character dialogue and interaction with 3-D objects that provide information that can help learners complete game tasks, add detail to their writing, or provide further clarification of advanced vocabulary terms that students must understand in order to solve puzzles or write their stories. By having students engage with text that forces them to continuously engage in a process of comprehension of text followed by retelling, our goal is to help develop automaticity in reading comprehension more rapidly than is traditionally encountered (Samuels, 2002; Stewart, 2004).



Figure 2. Three characters from the Chalk House.

In terms of the reading comprehension goals, the dialogue texts of various characters, objects, and archival materials in the space required that students read for multiple purposes such as: 1.) identifying relevant information, 2.) developing a context for their reading, 3.) entertainment, 4.) rereading when comprehension is unclear, and 5.) investigating the unknown, and 6.) making predictions and inferences using textual features and imagery such as pictures, paintings, and three dimensional images. As such, students are required to switch between reading purposes as they work through the learning tasks.



Figure 3. A view of the *Chalk House* within the Created Realities game framework.

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