

Work in Progress - Using the Virtual World to Improve Our World

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Abstract - Our college is leveraging Second Life to develop and build sustainable problem solving communities to address pressing social problems through the collaborative efforts of college students, high school students, volunteers, staff members affiliated with the Food Bank Council of Michigan (FBCM), and Gleaners Incorporated. Our approach is to have engineering students build a Second Life island that provides a structure for collaborative problem solving activities. Second Life serves as a vehicle to build a stronger community among food bank network members, to help conceptualize parameters of their problems, develop virtual solutions collaboratively, test these solutions, and then implement these solutions in the real world. Three projects were created in Second Life. Initial student survey data indicates satisfaction with the service learning experience.

Index Terms – Virtual worlds, Service learning, Serious games, Capstone design.

BACKGROUND

Virtual environments are being used in educational and business settings to solve real world problems [1] [2]. Some investigators argue that to make a substantial difference in participant engagement a virtual world should do more than duplicate a distance learning classroom [3].

Virtual worlds allow for participants to be in geographically dispersed locations [4]. Virtual worlds can provide flexible and adaptable environments for presenting multiple scenarios within a problem domain [5]. Even though virtual worlds only provide a simulation, participants are often quick to suspend their disbelief and engage themselves as if each scenario is real [6].

Outside of education, virtual environments can provide practical vehicles for solving real world problems. Some critics describe virtual environments such as Second Life as clumsy and initially difficult to learn [7]. Some authors have shown that tools similar to Second Life can provide inexpensive, viable test beds for developing solutions to real life problems [8]. Many of these projects only make use of the virtual environment to provide an inexpensive, premade user interface with malleable objects that react to reasonable physics.

Some investigators report creating a series of Second Life games to foster team development [9]. This suggests that game playing in virtual worlds can build a strong social

community through use of virtual environments to support team-building exercises. At least one author has reported that using role-playing scenarios eases the tensions of unpredictability in new situations and helps people to collaborate with each other in subsequent activities [10].

Our project attempts to do more than teach problem solving skills and build student teams in an academic setting. We are attempting to create an environment that will allow a group of stakeholders to interact and create a sustainable community focused on solving food banking problems.

PROJECT OVERVIEW

Students taking the CIS capstone design course provided the software engineering effort for this project. This course is offered as a two semester experience (CIS 4961, CIS 4962). Students receive two semester credit hours for each course.

Students take CIS 4961 after completing all required software engineering courses in their major field of study (computer science, information systems, or software engineering). The course projects completed by these students generally require about 500 to 800 hours of effort to complete.

Students are required to work in groups of three or four. Students select their own teammates and determine their own plan for rotating team leadership.

The role of the instructor in this course is that of a coach or mentor, not a project manager. The students handle routine community partner contact. Project scheduling and progress tracking is also handled by the student teams.

A final product demonstration and report is required of all teams at the end of the project. Students must present an acceptance letter from their community partner to their instructor to receive a grade for the second course (CIS 4962).

Three projects were developed by student design teams for the collaborative problem solving island. The first project involves creating a software system to support holding meetings simultaneously in real life and second life. Desktop video is streamed to the island to allow presenters to interact with geographically dispersed problem stakeholders.

A second project team is creating three interactive learning simulations (or mini-games) to educate users on how food is collected and flows through the food bank network to reach people in need. One game allows players to drive a truck among food pick up points using the

shortest route possible. A second allows users to experience the canned good sorting process that follows food collection. This helps drive home a message regarding the effort required to process donations. The third game allows players to manage efficient food distribution among several regions so that no region runs out of food.

The third team created 5 interactive exhibits highlighting local hunger problems and food banking best practices. One exhibit illustrates graphically the problems of waste encountered by food banks. A second exhibit helps the user visualize the impact of individual food donations on an entire city. A third exhibit challenges the user to create a complete meal from typical food bank items. The fourth exhibit allows users to listen to several people's hunger stories. The fifth exhibit allows users to see which items can be purchased with state issued vouchers known as bridge cards.

During the second semester of this project, we held a high school web site design competition. Seventeen two person teams were given the task of developing a multimedia web site which promoted food banking best practices and hunger awareness.

After three hours of development, each team gave a short oral presentation on the nature of their design and their creative vision for the web site. The final web sites were evaluated by professional web developers. The judges assessed the web sites for their technical quality, usability, accessibility, and aesthetic appearance.

EVALUATION

The senior design students completed surveys on their experiences working on this project at the end of each semester's work. Results suggest several positive changes took place for the students. Not only did they become very comfortable with scripting and object manipulation in Second Life, but they indicated that much of this new knowledge will be useful to them after they graduate. In particular, they believed the concept of shouting and listening was a good illustration of message passing and event driven programming. The students indicated that the project provided them with game design experience and opportunities for applying three-dimensional user interface design principles. They also felt their group communication skills had improved.

In aligning with the goal of fostering community involvement, the students claimed they learned a great deal about their community partner, through the interpersonal interactions with each other. They also claimed that the task of implementing an application to meet the needs of the community partner in a virtual environment fostered greater understanding of the problems to be overcome. Even though very few of the students claimed prior experience with community involvement, they indicated almost unanimously that they would be more willing to get involved in community service in the near future as a result of this project.

FUTURE PLANS

These projects will be deployed for public access by summer 2009. The investigators are working with the community partner to develop metrics to quantify the impact of this project.

We plan to host a conference on using virtual worlds to support the solution of real world problems. We will support this conference using our Second Life streaming media system. We plan to continue our student collaboration with Gleaners and hope to add more content to our island.

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