DESIGNING A SITUATIONAL 3D VIRTUAL LEARNING ENVIRONMENT TO BRIDGE BUSINESS THEORY AND PRACTICE

The Role of Scaffolding

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Abstract: The objective of the study is to explore the effect of scaffolding strategy in enhancing students' application ability in a 3D virtual learning environment. In order to provide students with a "hands-on" experience, we utilized virtual reality technology to build a 3D virtual supermarket (3DVS) to guide students to apply class theory to the practice. There is a female virtual customer poses questions during her shopping in the 3DVS, the participants have to be a clerk to answer the questions. The questions posed by the virtual customer are designed based on marketing mix theory (Kotler et al., 2006). We invited ten students to understand the system efficiency. The results of the interview indicated that the participants hold quite positive comments toward the system.

1 INTRODUCTION

Business students have to face the real world's problems right after graduation. However, most of them failed to well apply class theory to practice due to the disconnection of the above two factors. Constructivists (Vygotsky, 1978) claim that "experience" is a critical factor in learning process. To shorten the gap between theory and practice, business educators have been utilizing computer technology to provide students with many opportunities of experiential learning and try to enhance their decision-making and problem solving ability as possible as they can. However, the traditional lecture-based pedagogy in business school kept students be passive learners and did not give them opportunities to practice how to apply class learning to the practice, which left much space to be improved. Further, to be adapted in the real business world as soon as possible, students need to have a real- and life-like to integrate their class knowledge with practice.

Recently, virtual reality (VR) technology has been widely applied to various areas of education (such as the fields of science, medical, art, engineering, and vocational education). With the features of visibility, tangibility, manipulatability and interactivity, VR provides learners with a safety and repeated learning environment. Relatively, it highly reduces the learning/training cost. In the study, we build a 3D virtual learning environment to help students bridge theory and practice. On the other hand, for real world's problems are usually complicated for novice to reply, we utilized scaffolding strategy to guide students to answer the questions so that it will be easier for them to accomplish the task. Therefore, the objective of the paper is to explore the effect of scaffolding strategy in a 3D virtual learning environment.

2 THEORETICAL BACKGROUND

2.1 Situated Learning

Situated learning theory (Lave & Wenger, 1991)

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provides a theoretical background for VLE. The theorists claimed that learners are regarded as a participant in a community of practice; they are agents of their own learning in the process. Therefore, situated learning is the process that conveys knowledge through personal experiences. Meanwhile, past research concluded: "learning should be grounded in a practical world of everyday life" (Hedgegaard, 1998). Contrary to usual learning approach, situated learning theory stresses that learning activities should always be put into empirical settings to stimulate practical or theoretical ideas (Rømer, 2002). Based on situated learning approach, it'll be easier for students to learn knowledge where it is applied. In other words, "problem situations that closely resemble real situations in their richness and complexity so that the experience that students gain in the classroom will be transferable" (Schoenfeld, 1992, p. 365).

2.2 Scaffolding

Vygotsky (1978) claimed that teaching with guided interaction could be helpful to enhance a higher level of thinking, so it is essential to employ a proper teaching technique to facilitate students to integrate the textbook knowledge and decision ability in the real world. Scaffolding refers to a certain process that enables a novice or a child to solve a problem, implement a task, or achieve a goal which would be slightly beyond his ability (Wood, Bruner, and Ross,1978). Scaffolding tools that have been examined in the past research included question prompting (Scardamalia & Bereiter, 1985; Scardamalia, Bereiter, & Steinbach, 1984), expert modeling (e.g., Shoenfeld, 1985), reciprocal teaching (Palincsar & Brown, 1984), and guided peer questioning (King, 1991, 1992, 1994). In the system, we utilized question prompt technique to guide the participants to answer the questions.

2.3 The Situational 3D Virtual Learning Environment

Based on the theoretical framework stated above, we revised the situational 3D virtual learning environment (3D virtual supermarket; 3DVS) based on the prototype to help business students to personally experience the real-like simulated environment to apply class theory to the real world.
The virtual objects in the 3DVS are constructed through 3D modeling software --- 3Ds Max. To be as appealing as possible, all the virtual merchandises are displayed by departments and in the way of a real supermarket. The background of the 3DVS (like the ceiling, floor, wall, shelves and lighting) is also designed through 3Ds Max in order to be as real-like as possible. There is a virtual female customer, who is created from 3Ds Max, designed to pose questions in the environment. The database system is drawn to record the participants' answers and designed through MySql and Java programming.
When the system starts to process, the background music is played, it goes down when the virtual customer is going to stop. During the virtual customer's shopping procedure, she poses various questions based on the different departments she arrives at. A total of 10 questions are posed by the virtual customer.
Basically, all the questions, developed from marketing mix theory (Kotler et al., 2006), are formed to be a scenario-based environment, which is to provide a series of logically linked real-world case to scaffold students to apply class theory to the real world and higher-order thinking. Students are requested to reply the questions from the standpoint of a customer. The participants were guided to answer the questions by scaffolding specified after the question. Scaffolding strategies employed in the system include question prompting and reflective prompting.

3 PILOT STUDY

Ten undergraduate students in the course of marketing from a university in Taiwan were selected to participate in the pilot study. The participants were allowed two hours to finish the experiment, they were found to spend much time on thinking and integrating theory and practice during the process. In addition, a follow-up interview was conducted to explore the role of scaffolding strategy in the virtual learning environment and understand how helpful is the system in learning.

4 THE PRELIMINARY RESULTS

The preliminary results indicated that the participants hold quite positive attitude toward the system. First, the scaffolding strategy (question prompting and reflective prompting) used in the

system effectively helped students apply class theory to the practice. Second, the real-like system guided the participants to have the sense of "walk into" the environment, which give them the experience of real life. Even the experiment was not conducted in the real world; the participants reported that the experience is real-like. Third, the vivid environment not only provided much pleasure on learning but also contributed a lot on transforming abstract theory to be concrete application ability. Finally, the participants all consented that the scaffolding strategy employed in the system is helpful in guiding them to properly answer the questions.

5 CONCLUSIONS

The system is being revised and modified based on the preliminary results. Though the participants reported that the system is quite beneficial on shortening the gap between theory and practice, we hope that the design may lead to more varieties of application on future business education to support student's adaptation of the challenging business career.

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