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Comparing Sense of Classroom Community and Learning Satisfaction in a Virtual World Learning Environment

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ABSTRACT

Research in online education has demonstrated that sense of classroom community is an important factor in learning. This study extends the research to the new learning environment of virtual worlds and compares classroom community and learning satisfaction with different learning tasks in two distance learning courses. Students' perceptions of classroom community and learning satisfaction were measured. Nonparametric independent samples test was conducted to test whether perceived classroom community and learning satisfaction differed with different learning tasks in these two courses. Our findings indicated that a significant relationship was found between students' sense of classroom community and learning satisfaction but no significant differences of the two constructs were found with different learning tasks in two courses.

Keywords

Virtual world, virtual learning, learning tasks, classroom community, learning satisfaction, second life.

INTRODUCTION

Virtual world learning environments (VWLEs) are gaining interest from both academic researchers and industry practioners, as VWLEs become a new platform for business and online training. A VWLE can be defined as a computer-based simulated environment resembling the real world in which learning takes place through simulation and interaction among avatars and with virtual objects. In VWLEs, students learn through communication, interaction, and collaboration.

Second Life (SL) is one example of popular VWLEs. SL has been used as a learning environment by hundreds of institutions, but there is little research to support its effectiveness. The educational potential of VWLEs needs to be examined for people to realize the strengths and the challenges of this type of simulation environment for education.

THEORETICAL CONSTRUCTS

A common aspect of learning is social and communicative interaction between student and instructor, and between student and student (Picciano 2002). A number of studies have been done on interaction as an essential element to learning effectiveness in distance education (Fresen 2007; Picciano 2002; Richardson et al. 2003; Sher 2008). The goal of technology-mediated learning (TML) is to provide students with the sense and benefits of a traditional classroom (He et al. 2004), to overcome the frustrations that students tend to feel when not being able to directly interact with instructors and classmates (Hara 1998).

Learning Tasks in Virtual World Environments

In computer based collaborative learning, it is very important to choose suitable learning tasks that foster motivation, interest and the participation of the learners (Horn et al. 2003). Project-like and problem-based learning tasks encourage learners to learn through discussion, collaboration and problem solving with group members. TML researches focus on investigating unique features of the technologies that may have influence on learning (Zhao et al. 2004). VWLEs allow multiple learners to communicate and collaborate on the problem or task. With the capabilities of VWLEs, they can be a good platform for collaborative learning tasks.

Classroom Community and Learning Satisfaction

With increased sense of "being there" and "being with others" enabled by VWLEs, it is expected that students will perceive a high level of sense of community. Sense of community is defined as "a feeling that members have of belongings, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together (McMillan et al. 1986) (p. 9). Rovai and Jordan (2004) investigated sense of classroom community in learning. Their results show that the interactions result in increased socialization and a stronger sense of being

connected to each other, which in turn increase the construction of knowledge through discourse and provide stronger feelings of learning satisfaction.

A unique characteristic of VWLEs is their resemblance to the real context in which learned abilities apply; therefore VWLEs can provide support for the transfer of knowledge and skills. Students can benefit both instructionally and socially in VWLEs. There remains a need to examine the perceived classroom community and learning satisfaction with different learning tasks. The following research questions were investigated in this paper:

- Does perceived sense of classroom community differ with different learning tasks in a virtual world learning environment?
- Does perceived learning satisfaction differ with different learning tasks in a virtual world learning environment?

RESEARCH METHOD

We designed an exploratory study to examine the research questions and to assess implications for learning in a VWLE. The study was an educational field study conducted over a period of six weeks in two undergraduate courses at a Midwestern university.

Participants

Two courses that participated in the study were completely Internet-mediated courses – introductory statistics class (course 1) and introductory management information systems class (course 2) in Fall 2008. 25 students enrolled in course 1 while 24 enrolled in course 2. 19 and 13 students among those who completed courses responded to the post survey respectively.

Procedure

Both courses were structured around lecture videos, readings, individual assignments, and group projects. Second Life was adopted for class/group meetings and the group projects. In course 1, two Q/A sessions were conducted in Second Life via text and voice chats. The group project required students to analyze a case related to the issues discussed in the course and submit a group report of their analysis and conclusions.

In course 2, a guest lecture about decision making in Second Life was taken place in Second Life in the middle of the semester. The group project in course 2 was to let students create a complete business plan for a "Second Life–based" electronic commerce enterprise. The project deliverables included an investigation report of an existing business in Second Life and project report. Group presentation was also taken place in Second Life.

In summary, Second Life was used more as a communication tool in course 1 whereas it was used as a learning environment in course 2 since students need to explore in Second Life to seek information about real companies in there.

Data Collection and Analysis

An online post survey was given to both courses after the final group project. The post survey contained demographic questions, Likert-scale questions adapted from validated instruments, and open-ended questions. We used descriptive statistics and correlation analysis to analyze quantitative data generated by the Likert-scale questions in each course. We then used Wilcoxon-Mann-Whitney test to compare two courses on sense of classroom community and learning satisfaction. Content analysis was conducted to analyze students' comments in open-ended questions.

RESULTS

Table 1. Descriptive Statistics of Study Constructs in Two Courses

Study Construct	Instrument Source	Scale Range	Mean		Standard Deviation		Cronbach's Alpha	
			Course1	Course2	Course1	Course2	Course1	Course2
Community of classroom	(Rovai 2002)	1 to 5	2.61	2.64	0.49	0.56	0.877	0.811
Learning Satisfaction	(Chou et al. 2005)	1 to 5	2.02	2.13	0.65	0.47	0.914	0.912

Cronbach's alpha was used to assess the internal consistency of the results across items within a scale. Table 1 shows the calculated alpha values, all of which were above 0.8, indicating that both scales loaded well and are reliable. Table 1 also shows the mean and standard deviation of each construct for two courses from the Likert-scale items.

Results showed that the perceptions of community of classroom in two courses were similar (2.61 and 2.64, between "neutral" and "agree"). The perceptions of learning satisfaction were also similar (2.02 and 2.13, "agree" with positive feedback to learning satisfaction survey items). Correlation analysis was then conducted. Table 2 shows that perception of classroom community yielded a correlation of .659 with learning satisfaction (r^2 = .43) in Course 1 and a correlation of 0.605 (r^2 = .37) in Course 2.

Table 2. Regression Results

To test whether or not	R	R Square	Adjusted R Square	F	Sig.
Course1	.659	.434	.401	13.054	.002(a)
Course2	.605	.366	.308	6.337	.029(a)

A standard direct entry regression was used to further analyze the relationship between perception of classroom community and learning satisfaction. Results indicated that a significant predictor equation was established in both courses (F = 13.054; df =1, 17; $p < .01$; F = 6.337; df =1, 11; $p < .05$). The results demonstrated that students' perceived sense of classroom community was a significant contributor to learning satisfaction. Non-parametric Wilcoxon-Mann-Whitney test results in Table 3 show that no significant differences were found in these two constructs between two courses. Wilcoxon-Mann-Whitney test was also conducted on demographic information of the students. Online experience was found to be the only factor in demographic traits that was different between two courses ($p < .05$). Mean rank of online experience is higher in course 2 than course 1 as shown in Table 4.

Table 3. Wilcoxon-Mann-Whitney Test Results

	Age	Gender	Class rank	# of online classes taken	Online experience	Classroom community	Learning satisfaction
Mann-Whitney U	105.500	121.000	108.000	108.000	21.500	117.000	110.500
Wilcoxon W	295.500	212.000	199.000	199.000	99.500	307.000	300.500
Z	-.695	-.134	-.618	-.400	-2.243	-.250	-.501
Asymp. Sig. (2-tailed)	.487	.893	.537	.689	.025	.803	.617
Exact Sig. [2*(1-tailed Sig.)]	.495(a)	.940(a)	.570(a)	.737(a)	.039(a)	.821(a)	.623(a)

Table 4. Test Results of Ranks of Online Experience

Course	Mean Rank	Sum of Ranks
1	8.29	99.50
2	13.81	110.50

Content analysis of open-ended questions showed different attitude and comments between students in two courses. In course 2, a majority of students reported that they liked the experience with Second Life and considered the virtual world experience to be unique, interesting and entertaining. They reported that most the problems they had encountered were difficulties with the technology – the heavy system demand and the not-so-intuitive interface design in Second Life. The overall attitude toward use of Second Life in course 2 was positive.

In course 1, more than half of the respondents reported that they did not like Second Life and did not think it added value to the course. In addition to the problems with Second Life, they also reported that they had a steep learning curve. Taking content analysis and statistics analyses results together, it suggested that students' attitude toward use of technology was associated with technical experience. However, some students' comments showed that the learning curve was not directly related to those with very little online experience. A computer science major commented that he's very experienced but he had problems with Second Life. He said '*I just never enjoyed the software (SL) at all.*' This negative attitude commonly found in course 1 suggested that the students did not use Second Life to its potential and therefore did not perceive the benefits of it as most of the students in course 1 only used Second Life as a communication tool for group project.

DISCUSSION

Descriptive statistics indicated that students in both courses perceived a high level of classroom community from the rich virtual world learning environment. The analysis results also indicated that students' perception of the classroom community in their learning experience is related to their perceptions of learning satisfaction. Our findings are consistent with previous researches in other learning environments.

No significant difference was found in perceived classroom community and learning satisfaction between two courses despite the different use of virtual world environment and different Second Life projects in two courses. Significant difference was found in students' online experience between two courses. Content analysis of students' comments suggested that their satisfaction with the technology was also different between two courses. However, some comments showed that students with more technical experience may be more sensitive and judgmental about the technical flaws of new tools and more resistant to the use of new tools, which implies that the technical experience does not always have a positive impact on satisfaction with and intention to use the technology.

CONCLUSION

Our findings suggest that perceived classroom community can be provided in virtual learning environment and the sense of it contributes to students' learning satisfaction. This study also explores how learning tasks and activities impact students' attitude toward the use of technology in online course. The limited amount of empirical research in the area of virtual world technology as a learning environment and lack of empirical research in the area make this study one of the contributions to the literature.

Several limitations apply to the study. The study was based on self-reported perceptions of students; however, self-report is both relevant and common practice for the key constructs. The sample size was small, but the constructs exhibited good reliability. The study provides a preliminary understanding of the impact of a virtual learning environment, but more objective measures of aspects of learning and learning outcomes would strengthen the conclusions.

Plenty of opportunities for future research exist. A comparative study with the same research design with different technologies, and in different institutions may help understand the impact of the VWLEs on learning processes and learning outcomes. We have just provided a preliminary exploration of this new phenomenon. It shows both opportunities and challenges for moving forward with virtual world learning environments in our continuing research in this area.

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