Effects of Online Interaction on Adult Students’ Satisfaction and Learning

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ABSTRACT

Many have questioned the efficacy of online instructional approaches; particularly as relates to what is learned and/or the satisfaction levels. A critical element in the success of these programs seems to be levels of Interaction occurring (Woods, 2002; Palloff & Pratt, 2001). This study examined perceptions of levels of Satisfaction and Learning occurring in an online program as relates to Salmon’s Five Step Teaching and Learning Model (2001) of Interaction (Access and Motivation, Online Socialization, Information Exchange, Knowledge Construction, and Development). The study involved the perceptions of twelve hundred and seventy-nine graduate students of various majors in a large U.S. private higher educational system. The students were electronically surveyed at the end of the course regarding their Satisfaction levels, levels of Learning gained and Levels of Interaction occurring. The students agreed slightly regarding Satisfaction, Learning and Interaction Levels. The Overall Interaction scores were positively and significantly related to Overall Satisfaction scores and Overall Learning Scores. Access and Motivation were most predictive of the Satisfaction experienced and Information Exchange and Development were most predictive of Learning gains. The study showed that providing good Access and Motivation are critical for influencing Satisfaction levels. Similarly, if one wants to influence Learning levels, Information Exchange and the Developmental use of information are necessary for beginning online users. Ideas are offered for improving online courses using Salmon’s Interaction ideas; along with proposing further research ideas regarding Interaction in online formats.

Keywords: adult learning, online learning, online satisfaction, online teaching

INTRODUCTION

Due to the fact that teachers and students in online settings are not in the same physical place, some experts (Volery & Lord, 2000, Woods, 2002) have come to question the level of interactions demonstrated in online courses, with the ultimate concern being that the levels of interaction are minimal, artificial and simply “too distant”. The levels of interaction between the students and the instructors may be a principal concern in online education (Volery & Lord, 2000; Woods, 2002). Higher levels, or different forms of interaction, may be necessary to motivate and satisfy online learners in these somewhat artificial educational environments. This paper examines how students across one large, for profit, private higher educational system viewed their recent online course experiences.

Although still somewhat controversial, the consensus seems to be that learning in online settings can be at least as effective as in more traditional classrooms (Hiltz, 1997; Brown, 2000; Russell, 1999; Parker & Germino, 2001) this is not always the case however. Smith (1996), for one, noted that thirty percent of the students surveyed said they would never choose a distance education course after their first experience, as they felt they could never get the quality that they expected in a face-to-face course.
Woods notes (2002, p. 385), “student satisfaction with the overall learning experience depends, in no small part, on the perceived sufficiency of faculty interaction and involvement in course delivery”. Many experts (Moore, 1989; Palloff & Pratt, 2001) are of the opinion that the interactions (with instructors, with other students, and with the material itself) that occur in online settings are the keys to the success of such programs.

The present study investigated how perceptions of Interactions in online courses were related to Overall Satisfaction and Learning in such courses. In order to test this proposition, Salmon’s (2001) Five-Step Teaching and Learning Model (based on online Interaction ideas) was tested against measures of Overall Satisfaction and Learning in online classes.

Using this model, twelve hundred and seventy-nine (65% out of the initial nineteen hundred sixty-eight) graduate students (either business, psychology or education majors) registered in online courses responded to an invitation to participate in an electronic survey of their experiences at the end of the online courses at the particular university. Several follow-up invitations were sent. The University’s online program was a little more than a year old at the time.

**SALMON'S INTERACTIVITY MODEL**

Salmon’s (2001) Five-Step Model of Teaching and Learning (also called the E-Moderating Model) addresses each stage of interactivity; each step is thought to require different e-moderating skills and different intensities of interaction from participants (Farahani, 2003). Salmon (2001, p. 24) “concentrated on understanding the naturally occurring online behavior” by analyzing 3000 messages from voluntary MBA Computer-mediated conferencing (CMC) courses conducted at the Open University. Based on this strategy, and on data collected from a content analysis, exit interviews, and focus groups during 1997-99 (Salmon, 2001) developed her “E-Moderating Model”.

Salmon’s five-step model is a model of teaching and learning online. The graphic below (Figure #1), offered by Salmon (2001), represents the five-step interactivity model.

![Figure1 Salmon’s(2001) five-step teaching and learning online model.](image-url)

The five steps in Salmon’s interactivity model (2001) are: Access and Motivation, Online Socialization, Information Exchange, Knowledge Construction, and Development. The details of each step are explained in the following sections.

Stage One: Access and Motivation
Stage one is based on the access to information needed by the students. The major emphasis here should be to make access quick and easy. Technical support, such as configurations of hardware, software and network access and inquiry, and access passwords are important factors here. Providing motivation is another key factor at this stage, especially when confronting technical problems. This element calls for welcoming the participants and providing them help, through email and/or telephone conferences in order to maintain individual motivation. This stage is completed when participants have sent out their first few messages.

Stage Two: Online Socialization
Stage two begins with the participants becoming more familiar with being in the online learning environment. Participants often express their behaviors, needs, fears, and feelings at this point. It is critical here to start building an online learning community where the participants feel they are working together on common tasks and that others are feeling the same way. Preece, (1999, p. 70) states “The empathy developed through this stage of online interaction provides an essential prerequisite ingredient for later course and knowledge related discussions”. It is important here to create a learning environment where the participants feel respected and that they respect others for being in the same situation. This stage is different, however, from stage four which encourages productive and constructive exchanges of views. The idea at stage two is to help the student realize that they have a base of people to communicate with. This stage is finished when participants begin to share their fears, thoughts and information among themselves.

Stage Three: Information Exchange
Stage three begins with participants having access to information. Participants start to appreciate the wide range of information available online and become more independent, confident, and enthusiastic about working online. There are two kinds of interaction required for participant learning here: interaction with the course materials and interaction with both the instructor and the other participants. The main task for the instructor here is to inspire productive and constructive information sharing by showing and connecting data, analyses and ideas (Salmon, 2001). Providing automatic answering of frequently asked questions can help to avoid unnecessary confusions at this point. Preece (1999) notes that at this stage participants gain motivation and enjoyment from personal and experiential information exchanges. Before moving on to stage four, full-scale interaction, the participants begin to learn how to share information in their discussions.

Stage Four: Knowledge Construction
Stage four begins with the participants starting to communicate with each other through deeper interactions. “The learning becomes not merely active ... but also interactive” (Salmon, 2001, p. 32). Most importantly, the communication platform between instructors and participants becomes flattened, instead of remaining hierarchical. Highly productive collaborative learning develops here and the participants become online authors instead of mere information transmitters. Murphy (1999) calls this knowledge construction not just information dissemination.
Stage Five: Development

Stage five begins with participants becoming more responsible for their own learning through the online education medium. Here they need less support than what they needed earlier. Stage five is based on the constructivist approach (Piaget, 1954) to learning for both instructors and participants. Biggs (1995) notes that constructivism is a theory which encourages students to critique their own thinking and knowledge. At this higher skill level, participants reflect, articulate, and evaluate their own thinking, and they learn to value the technology for their own learning. This is a reflective stage and it is the highest level of learning in the online setting.

The Procedure

As was mentioned, nineteen hundred and sixty-eight students who recently finished online courses at a private national higher educational institution were surveyed at the end of the course with an electronic questionnaire regarding their perceptions of their online experience thus far. Twelve hundred and seventy-nine (65 %) responded to the invitation to participate. Multiple follow-up attempts (2) were necessary, in order to encourage the participation levels obtained.

The Measures

For all parts of the electronic questionnaire used here, a 6 point Likert format was utilized (6=Agree very much, 5=Agree moderately, 4=Agree slightly, 3=Disagree slightly, 2=Disagree moderately and 1=Disagree very much); along with a N/A, Not Applicable, category for situations where the respondents did not feel that an item applied. Negatively worded items were included at some points; these items were ultimately reverse-scored.

First, the items included in the Satisfaction measure were based on slight modifications to the Virginia Polytechnic Institute/FlashlightTM Current Student Inventory (TLT Group, 1997). Chiu (2002) noted that these Satisfaction items were originally derived from educational theory and that the reliability and validity information for this scale has been found to be psychometrically sound.

Student Satisfaction with the online process was measured using fourteen items. The specific Satisfaction items were:

- The course was well organized.
- The course aims and objectives were made clear.
- The written objectives actually agreed with those taught in the course.
- All materials and resources needed to complete the class were readily accessible.
- The technology used in the course did not work properly.
- I became more confident that I would do well in my program as a result of the course.
- I acquired skills that will be useful in my profession.
- Because the course was online, it was easier to juggle my course work with my work and/or home responsibilities.
- Because the course was online, I put in less time traveling to and from class.
- The course was just as good as, or better, than the same material in a face-to-face course.
- I will take another online course.
- I would now prefer to take all courses online.
- I would not recommend the course to others.
- Overall, I am very satisfied with the course.
Second, perceptions of Learning gained were assessed using a modified version of the SALGAINS instrument developed by Seymour, Wiese, & Hunter (2000) and available on the web-site http://www.wcer.wisc.edu/nise/c11. This measure was originally designed to summarize students’ perceptions about their online learning gains from various course elements. These authors report that students can make realistic appraisals of their gains from aspects of various online class pedagogical approaches, and that revisions in courses can be made from these results. The specific items used to measure Learning were:

- We were not encouraged to interact with the instructor about the ideas and concepts.
- The class activities, labs, readings, and assignments fit together well.
- The number and spacings of feedback were useful.
- The mental stretch required of us was stimulating.
- The grading system used was appropriate for the level of the course.
- The text was useful.
- The other reading materials were helpful.
- Use of additional www sites in this class were helpful.
- I have greater confidence in my ability to do the work in this field as a result of this course.
- I feel more comfortable with complex ideas now.
- I now have more enthusiasm for the subject.

Third, measuring Salmon’s model, the Access and Motivation ideas from Salmon’s Five Step Teaching and Learning Model (2001) came primarily from Farahani’s (2003) questionnaire measuring Salmon’s original ideas, with one idea coming from the Virginia Polytechnic Institute and State University survey (Ehrmann & Zuniga, 1997). Some questions in The Access and Motivation (Step 1) included:

- The instructor’s greeting before the first session was helpful.
- The instructor’s guidance helped me to succeed in my online course.
- The instructor ensured students received and knew how to send messages as soon as we were online.
- The “look and feel” of the course site was user-friendly.
- The instructor offered advice and tips (identifying assignment numbers, dates, etc.) for developing online skills.

Interaction through Online Socialization (Step 2) was measured using the following four items coming from the Farahani (2003) scale (based on Salmon’s 2001 ideas):

- I felt connected to the other students.
- The class environment provided me with a sense of confidence in discussing unfamiliar topics.
- The students’ introduction of themselves was helpful.
- The students’ were given opportunities to interact informally by email, online discussions, etc.

The Information Exchange (Step 3) aspect of Interaction was measured using Farahani’s (2003) ideas (again, based on Salmon’s original work):

- The instructor provided directions for constructive online discussion.
- The instructor provided links to suitable sites to stimulate the online discussion.
- Access to the permanent records of the discussions helped me to understand the topic better.

The Knowledge Construction (Step 4) aspects of Interaction (Salmon, 2001) were measured using the following items (from Farahani’s 2003 scale):

- The majority of the students contributed to the online discussions.
- The online group project provided me with a sense of community.
The instructor provided incentives (points, etc.) to put the necessary time and effort into online discussions.

The instructor regularly monitored the discussions.

Salmon’s (2001) Development step (Step 5) of Interaction (primarily from Farahani’s 2003 work and one item from the 1997 Virginia Polytechnic Institute scale) was measured by:

- The online discussions improved my learning.
- The sense of community in the online course improved my awareness of this field.
- I was able to apply the knowledge gained during the semester to support my arguments in my final project.
- The online discussions helped me to explore issues and to take positions in a successful argumentative format.
- I was challenged to solve problems in the course.

Four demographic variables were also examined in the present study. They were gender, age (with 4 categories—under 25, 26-35, 36-45, and over 45), number of online courses taken (with 4 categories—1-2 course, 3-4 courses, 5-6 courses, and more than 6 courses), computer skills (with 5 categories—1=beginner, 2=below average, 3=average, 4=above average and 5 expert) and the students’ major area of study. These items were included in order to better understand how the demographic factors might relate to Interaction levels, and student Satisfaction and Learning.

**ANALYSIS**

Students’ Satisfaction was the dependent variable and perception of Interaction in the online setting was the independent variable. Correlation analysis and multiple regression were applied here to measure the relationship between these two variables.

Students’ Learning was the dependent variable and perception of Interaction was the independent variable. Correlation analysis and multiple regression were applied here to measure the relationship between these two variables.

Students’ Satisfaction and Learning were the two dependent variables and gender, age, numbers of online courses taken, and computer skills, were the four independent variables. An analysis of variance (ANOVA) test was used here to compare and analyze for significant differences on the two dependent variables. A significance level of .05 was used here.

**RESULTS OF THE STUDY**

The responding group (N=1279) was composed primarily of women (70.5%), most were between the ages of 36-45 (46.8%), most had taken 1-2 online courses (43.4%) and most described their computer skills as being average or above (94%). As can be seen in Table 1, the students reported that Access and Motivation Interaction levels were on the plus end of the scale with a mean score of 4.69 (where a 4 indicated Agree Slightly, and a 6 equaled Agree Very Much). Development Interactions (mean of 4.31) and Information Exchange Interactions (mean of 4.24) were also positive, but not excessively so. Lower Interaction levels were reported for Online Socialization (mean of 3.59, with a 3 indicating Disagree Slightly) and for Knowledge Construction (mean of 3.89). The perception of Overall Interaction (across all Interaction Dimension scores fell at 4.14 (Agree Slightly). Overall Satisfaction levels, a major dependent variable here, fell on the positive end of the scale (mean of 4.70) and Overall Learning levels,
the other major dependent variable, was also on the plus side of the scale (mean of 4.3917, out of a total possible score of 6) (Table 1).

As seen in Table 2, although the various Interaction measures were correlated with each other, the perception of Overall Interaction and Overall Satisfaction scores were positive and significant (r= .736), and the Overall Interaction level scores and Overall Learning (r= .804) were significant and positive also. These results suggest that as the Interaction levels increase, so do the Satisfaction and Learning scores increase as well. In the test of the specific parts of the Interaction Model, Access and Motivation (use of the machines, technology and the support provided, etc.) was most predictive of the Satisfaction experienced by the students (r=.70); while Information Exchange (feedback from the professors; instructors provide links to suitable sites to stimulate the online discussion, etc.) and Development (I usually composed my ideas and reread and revised them before posting, I was challenged to solve problems in the course, etc.) were most predictive of the Learning gained (r=.74 and r=.713 respectively). Similarly, a multiple regression analysis test showed that Access and Motivation accounted for most of the Satisfaction levels reported (Table 3) and Information Exchange and Development accounted for most of the Learning levels reported (Table 4). No significant differences were noted on Satisfaction and/ or Learning as relates to the demographic data collected.

CONCLUSIONS AND RECOMMENDATIONS

In spite of online courses sometimes being labeled as artificial (Volery & Lord, 2000; Woods, 2002), the present study showed at least acceptable levels of Satisfaction and Learning associated with the online classes delivered in this higher educational setting for adult learners. This study has filled the gap of understanding how adult learners have perceived online learning as well as provided the importance of interaction in virtual learning settings. Positive correlations between Overall Interaction and student Satisfaction and Learning were noted; as Interaction levels went up, Satisfaction and Learning scores tended to go up as well. These findings seem to re-emphasize the importance of promoting Interaction in online settings, as recommended in the constructivist theories of learning (Brook & Brook, 1993; Fosnot, 1996) and in Salmon’s Five-Step Teaching and Learning Online Model (2001). These theories suggest that it is important for instructors to encourage active participation in the learning process. The Best Practices for Electronically Offered Degree and Certificate Programs (2001) published by the Middle States Association of Higher Education also seem to reinforce these points: “Learning is dynamic and interactive, regardless of the setting in which it occurs” (p. 1). The results obtained in the present study seem to confirm the idea that Interaction plays a key role in students’ Satisfaction and Learning levels in online settings.

The various steps of Salmon’s Teaching and Learning Online Model (2001) were also tested as relates to Satisfaction and Learning levels. Significant positive relationships were noted between each Stage of the Model and student Satisfaction and Learning levels. A multiple regression analysis also showed that Access and Motivation levels accounted for most of the Satisfaction levels reported and that Information Exchange and Development levels accounted for most of the Learning levels reported.

One can see how Access and Motivation, the most predictive score of Satisfaction levels, can be an important element as relates to Satisfaction. If Access and Motivation are not present, Satisfaction will probably not occur. This makes intuitive sense and was confirmed here. It is important for an individual to have good Access to technical support early on and they need to be motivated by the instructor in order to be satisfied. One can see how the learning process may be frustrating otherwise. Similarly, Information
Exchange (finding that the technology can be used as a tool for information transmission, etc.) and Development (evaluating different ideas—especially their own work, etc.) were most predictive of the Learning levels obtained. Emphasizing the power of the Internet and learning how to develop and evaluate one’s own ideas may be powerful instructional tools for influencing the levels of Learning achieved in online classes.

Certainly improvements can be made in this online program. “Agreeing slightly” (with a maximum scale choice of 6, “Agreeing Very Much), suggests room for improvements. In looking closer at each stage of Salmon’s Teaching and Learning Model (Interaction), two specific stages, Online Socialization and Knowledge Construction, need greater attention by the administrators here, receiving mean ratings of 3.5918 and 3.8896 respectively. Both of these scores fell at the Disagree Slightly level on the survey scale.

For Online Socialization to occur, it is important to build an online learning community where students feel they are working with others. Palloff and Pratt (1999, p. 29) conclude, “The learning community is the vehicle through which learning occurs online”. This, again, suggests that online Interaction is as an essential prerequisite for later course and knowledge related discussions (Preece, 1999). Salmon (2001, p. 28) also emphasized that “Sensitive and appropriate conference design and the e-moderator’s intervention cause the socialization to occur”. Consequently, it is important to train instructors to create an environment where students feel comfortable, and respectful toward both the instructor and other students, and one where students reach out to others and get involved with others. As Farahani (2003) noted, this stage is particularly important for new online students, due to their initial unfamiliarity and fear in the online environment. Steps should be taken to help them feel secure. It would seem that building elements into the course where students introduce themselves, get to know others, and where they learn that they can help each other, and that they are not being left alone to fail, are critical pieces to the online learning puzzle.

Similarly, the mean Knowledge Construction scores for this group were also low. Instead of being just information transmitters, the students here needed to feel more competent at composing ideas and communicating them online. This may be accomplished when the students get beyond the fear of the online environment, and when the instructors have more time to actually critique written work (rather than just trying to build the courses and respond at some minimal levels; this online program was relatively new). Further research is needed to help clarify how best to increase these Knowledge Construction skills, along with facilitating the Online Socialization process.

Clearly, as Learning goes up, the Satisfaction levels may also increase, as has been demonstrated here and in previous studies (Swan, 2001). From a marketing perspective, the students are the customers in these higher education settings. Consequently, the higher Satisfaction levels could also result in people passing on recommendations to their friends to enroll in such programs. This could lead to clear competitive advantages in the online business market.

Regardless of the pros and cons of online educational programs, the online learning approach seems to be becoming even more popular (Trull, 2001; Chiu, 2002)—and it is not likely to go away. Because of gas prices today and because of the sheer convenience of using this approach, the online format is probably going to be a staple item in the educational environment. Online learning seems to be here to stay. It is important, then, to ensure that the Learning and Satisfaction levels of students in this expanding market are addressed. It may come as a surprise to learn, however, that the particular University studied here, has turned to more “Blended” formats—where students must come to campus at least part of the course time, and often early on in their programs, so that they can become more familiar with who is in
the class and to learn more about what the University is actually like, etc.-- “in-person”. These blended formats are becoming discussed more in the literature, as alternative educational approaches (Allerton & Kaplan-Leiserson, 2004). Perhaps the pendulum is swinging back however, with a more moderated or mixed approach.

Although there were some limitations in this study and in spite of the fact that real “hard data” on learning achievement was not formally tracked here, the present results are a good start at trying to understand, from a data-oriented perspective, the perceptions of adult students in online courses. With these early findings of significant, positive relationships between Interaction and Satisfaction and Interaction and Learning, it will be interesting to see how other Colleges/Universities in these early stages of using the online format will actually impact their students. For instance, is the learning “real”, will the learning “take” and “hold”; are the work products really the student’s own work, or does the student in such environments begin to perceive the learning world as a typing class—with no real opportunities to see the body language, the non-verbals and/or other cues in learning from and with others.

The present study offers some future research ideas also. They are: 1) The scale used here may be applied by other organizations interested in assessing perceptions of the Interactions that are occurring in their online classes, how much student Satisfaction is occurring as a result of this forum and self-reports of how much Learning is taking place; 2) Because the individual Interaction measures were so correlated with each other, a factor analytic study may prove useful also in clarifying the relationships among the Interaction dimensions; 3) These results should be related to “harder measures” of learning as well; 4) The present study provided a test of a theoretical model related to online learning—further refinements of this, and other theoretical learning models, should be conducted to clarify the mechanisms involved in the online process; 5) These learning model tests should also involve monitoring the number and types of contacts occurring in online classes, how many online classes can be handled by one professor at a time, as well as the types of discussion questions, and assignments that are most beneficial.

Clearly, the present results are a beginning in better understanding the online environment for adult learners. More, however, needs to be learned about this popular educational medium; especially how much and what types of Interaction are really needed and how best to maximize the effectiveness of this medium with students. The world is definitely changing, and the educational environment is no different than other organizational settings; staying current, understanding “our clients” and their reactions, and continually making improvements in this pedagogical approach are critical to staying at the forefront of the educational learning curve. If online students have the potential to learn as much as, or even more than traditional students, or to be just as satisfied as traditional students, the results of this study could be helpful to institutional decision-makers in expanding their online educational programs. Consequently, the advantages of online or distance education tools can be maximized. Adult learners are increasingly demanding courses that are time and place convenient to their lifestyles and schedules. If schools and higher educational institutions include distance educational programs, with similar or greater learning and satisfaction level as compared to traditional programs, they might also receive significant economical benefits by implementing more online programs. Finally, educators should interact regularly with each other about online teaching strategies, and what works or what does not work; in order to most effectively teach their students. This would help to bring out the best features of this important educational medium.
### Table 1. Descriptive Statistics of Interaction, Satisfaction and Learning

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<th>Mean</th>
<th>Std. Deviation</th>
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<tr>
<td>Overall Interaction</td>
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<td>Satisfaction Mean</td>
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<td>Learning Mean</td>
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### Table 2. Correlations of Interaction Dimensions, Satisfaction Scores and Learning Scores

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<th>Inform. Exchange (Q15-Q19)</th>
<th>K. Construction (Q27-Q32)</th>
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<td>.447(**)</td>
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Table 3 Regression model for Salmon’s five-step interactivity model and students’ satisfaction

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<th>R Square</th>
<th>Adjusted R Squared</th>
<th>R Square change</th>
<th>Std. Error Of the Estimate</th>
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**Correlation is significant at the 0.01 level (2-tailed)**

Table 4 Regression model for Salmon’s five-step interactivity model and students’ learning

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