
The Effect of E-Mail Messages on Student Participation in the Asynchronous On-Line Course: A Research Note

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Introduction

In the asynchronous learning network (ALN), the learner should have more control of the acquisition of knowledge as compared to the traditional classroom. Learner control is one of the primary reasons cited by proponents to lend support to web-based instruction (WBI) and other forms of ALN's (Oliver, 1999). However, WBI in a completely asynchronous environment increases the burden on the learner to be responsible for the outcomes of his or her own learning experience (Young-Ju, Bong & Choi, 2000, Olugbemi et al, 1999; Carrier, et al., 1986). As the integration of WBI into traditional academic programs increases, the typical learner in the asynchronous environment will be the traditional college student who probably has limited exposure to a self-regulated learning environment. Therefore, the student may experience problems with successfully completing a course offered under strictly asynchronous methods. The purpose of this research note is to examine the effect that computer mediated communication (CMC) has on learner activity levels in a self-regulated ALN environment and to determine whether or not CMC can be used to positively influence the learning experience.

Literature Review and Hypothesis Generation

Hiltz (1994) identified that many students drop out of an online course because they simply let the course get away from them. That is, they put off working on the course, until it was too late to realistically finish the course objectives in a timely manner. Hiltz (1994) further states that students who dropped the course cited reasons such as an inability to effectively schedule their time. Belawati (1998) indicates that one of the major factors for a lack of active participation is whether the students' study approaches and the instructional design of the course(s) are congruent. Dellana et al (2000) notes that poor attendance in both an online and traditional course were shown to be detrimental to student performance. Bourne, et al (1994) notes that students tend to procrastinate more in online courses.

Therefore, it is a fundamental conclusion that in both traditional and the on-line courses the learner must be an *active* participant in order to be successful. The traditional course has an advantage over the on-line course as it facilitates active participation through the requirement to meet at a specified time and place. That is, the traditional course has the structure that traditional and non-traditional students are familiar with and therefore tend to have more active

participation. Therefore, a fundamental problem exists for an asynchronous WBI course; how can the instructor ensure active participation and therefore facilitate success for the online student?

Many proponents of online education suggest that a strategy for successful ALN implementation include a method of monitoring student participation and activity levels (Palloff & Pratt, 1999). Further, feedback to the student is important for them to understand that they are progressing well in the course (Bourne et al, 1994). Therefore, one might conclude that if a student was informed of their activity and participation levels, he or she might respond positively to the feedback and subsequently adjust their participation levels in the course. This proposition is supported by Lee (1994) who suggests that individuals who "receive e-mail are not passive recipients of data, but active producers of meaning (p. 154)." That is, an e-mail message can produce the same fundamental response as a face-to-face message (Markus, 1994; Chidambaram & Jones, 1993). Therefore, e-mail messages alerting the learner as to their current state of activity and participation should serve to facilitate the need for structure in their course experience.

CMC research also suggests that the type of e-mail message sent will influence participation activity. Surinder and Cooper (1999) found that positive messages tended to increase task-oriented activity. McComb (1994) indicates that CMC messages will tend to focus the student on an instructor's caring nature. In addition, CMC research has consistently shown that negative cues result in a more positive reaction than traditional face-to-face communication (Fishman, 1996). This is because the receiver of negative cues is less likely to take comments and criticism personally when delivered by CMC versus face-to-face interactions (Olaniran, Savage, & Sorenson, 1996; Strauss & McGrath, 1994; Dennis, Nunamaker, & Paranka, 1991).

Therefore, the following hypotheses are presented:

H1: In an online course, negative reinforcement delivered via e-mail messages will have a positive effect on student activity levels.

H2: In an online course positive reinforcement delivered via e-mail messages will have a positive effect on student activity levels.

Study Procedures

The Setting and Participants

The course is designed to educate students in the principles of information systems and software concepts and is part of a core curriculum at a medium sized southern university. This eight-week course was presented to the student during the summer term of 2001. There were sixty-two students in the course, 57% female, 43% male, and an average age of 24. Most students indicated that they had a limited amount of prior computer experience (77%) and thus identified themselves as novice computer users.

The teaching method was asynchronous learning and the course material was conveyed through computer-generated modules (tutorials), which simulate the software environment. A total of twenty-six course modules were used to present the course material to the student. These modules were developed using Macromedia's Authorware[®] program and were accessible through the Internet. Students could access the online modules at any time and from any location. Therefore, regular attendance at the scheduled lab or class sessions was not required, and all

work could essentially be done from home. In addition, several un-proctored online quizzes and a proctored final exam were required. All students had access to face-to-face instructor interaction. However, the vast majority preferred the online method of instruction.

The Method of Data Collection

Students were informed that their activity levels would be monitored. The activity level was determined by the number of minutes a student spent in an individual module. Each time the student logged into an online course module, their activity level was automatically measured and recorded into a central database. An activity report was generated for the student every five days. A total of nine activity reports were generated for each student during the eight-week course. When an activity report was generated the student was assigned to one of five categories based on their activity during the corresponding reporting period. A coded e-mail message was assigned to each category. The positive or negative tone of the coded e-mail message was directly related to the activity level of the category to which it was assigned. The e-mail was coded using the scale in the following chart.

Table 1: E-Mail Codes

E-mail Code	Activity Level During Reporting Period Indicates	E-mail Tone
1	The student spent no time in the modules.	Negative
2	The student spent relatively little time in the modules.	Negative
3	The student spent a fair amount of time in the modules, but probably would need to spend more time in order to be successful in the course.	Slightly Negative
4	The student spent a great deal of time in the modules and therefore was proceeding very nicely.	Positive
5	The student spent a significant amount of time in the modules and was doing very well in the course.	Very Positive

Data Analysis

The time difference between the prior and current reporting period was calculated. That is, the student's activity level prior to the e-mail message was subtracted from student's activity level in the reporting period following the e-mail message. The result directly reflected the change in a student's activity level after the activity report was delivered via e-mail. A simple regression model was calculated with the e-mail code as a predictor of the time change.

Nine students dropped out of the course during the summer term. The data points collected from these students were excluded from this study. Thus, we have a total of four hundred and

seventy-seven individual data points collected from the nine activity level reports that were generated for fifty-three students.

Results

The results of the simple regression model with the e-mail code as a predictor of the change in activity level are presented in Table 2. The resulting regression equation was:

$$\text{Diff} = 127.622 + (-38.489 * \text{Mail}^*) + \text{ERROR}$$

* p > .0001

The prediction of each type of e-mail was calculated and presented in Table 3

Table 2: Regression Results

Statistical Analysis	Value
Dependent Variable	Diff
Number of Observations	477
Multiple R	0.3972
R-square	0.1554
Adjusted R-square	0.1525
F (1, 293)	53.9035

Hypothesis Support

As Table 3 indicates the negative e-mail messages had a positive effect on activity levels, while the positive e-mail messages did not seem to have either a positive or negative effect. Therefore, for this population, we fail to reject H1 and reject H2.

Table 3: Prediction Results

E-mail Type	Equation	Predicted Result
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1	Diff = 127.622 + (-38.489*1) + ERROR	89.133 + Error
2	Diff = 127.622 + (-38.489*2) + ERROR	50.644 + Error
3	Diff = 127.622 + (-38.489*3) + ERROR	12.155 + Error
4	Diff = 127.622 + (-38.489*4) + ERROR	-26.334 + Error
5	Diff = 127.622 + (-38.489*5) + ERROR	-64.823 + Error

Discussion and Conclusion

This data seems to support the prior CMC research, which shows that negative e-mail cues will result in positive changes. Further this data shows that positive e-mail cues resulted in no change or a negative change in activity levels. That is, if a student is given structure through feedback on a negative activity level, they respond with increased activity. If a student is given positive feedback on their activity levels, they respond with no increase or in some cases decreased activity levels. This is not meant to indicate that a positive e-mail message has a detrimental effect on activity levels. This simply shows that some students are ideally suited for a self-directed learning environment and do not require instructor feedback to facilitate their success. Students that did not require feedback were able to effectively manage their time and activity levels in the course.

In brief, the e-mail messages tended to increase the motivation of the student who was categorized as not progressing at a satisfactory level in the course. Some students in this category even replied to the e-mail message apologizing for not "coming to class." Students who were performing at the levels that resulted in positive e-mail messages rarely responded to the feedback other than to say thank you for paying attention. However, the e-mails did not seem to have an overall negative or positive effect on their work in the course.

Limitations

As with any type of research, this study does have limitations. First, as the regression model indicates, we did not measure all the variance that accounted for increases in activity levels. That is, there are many other factors that will affect activity levels. These factors might include the individual demographic differences of the student, attitudes toward online learning and computers, and self-efficacy with the subject matter.

In addition, the timing of activity reports delivered via e-mail could also be a limitation. That is, the course was self-regulated and the student may have been doing most of their work at the end or beginning of the reporting periods. For example, a student that scheduled most of their work on the weekend would have regular activity on a seven-day cycle. Activity in a seven-day cycle

may be recorded as irregular in the activity level reports that were generated every five days.

Conclusion

This study set out to test the effect of positive and negative e-mail messages on the activity levels of students in an asynchronous course. The results seem to support the overall proposition that some students need structure in their course activities and this structure can be facilitated through feedback from the instructor via e-mail messages. For some students, the course is truly self-regulated and thus e-mail cues may not have any effect. Further research is needed to identify other variables that effect the student's motivation to succeed in the asynchronous course.

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