

Learner–Instructor Telephone Interaction: Effects on Satisfaction and Achievement of Online Students

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The telephone has a long history as a distance learning technology. This study investigated its impact on the satisfaction and achievement of online students. To measure satisfaction, the expectancy disconfirmation paradigm was used. Online students completed an instrument based on this paradigm at the beginning and end of the semester. A randomly selected treatment group received one telephone call from their instructor during the first two weeks of the semester. Achievement was measured by course grade. The study found that the telephone call had no significant effect on the level of satisfaction reported and that grades of the treatment group were slightly lower than those of the control group. Despite these findings, the majority of students (65%) rated their online experience as having exceeded their expectations.

Learner–instructor interaction permeates the online learning experience, and its importance in student learning is well established (Fulford and Zhang 1993; Moore and Kearsley 1996; Rovai 2002; Wegerif 1998). Simply stated, learner–instructor interaction is communication between the instructor and the student in a course. In the case of online learning, such interaction is not limited to instructional communication but may also include off-line communication and personal dialogue (Woods and Baker 2004). Although online instructors are frequently encouraged to actively construct relationally supportive online environments (Palloff and Pratt 1999), online courses are frequently criticized for their failure to achieve adequate levels of interactivity (LaRose and Whitten 1999, 2000). Although much research has been dedicated to the social roles of

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students and teachers as well as the creation of virtual communities, there has been little work that specifically looks at the role of learner–instructor telephone interaction as a predictor of satisfaction and achievement.

Literature Review and Conceptual Framework

Though the use of the telephone in teaching began in the 1930s, its large-scale use in distance education took place in the 1960s, '70s, and '80s (Olgren and Parker 1983). The term *audio learning* came to refer to learning that took place over a telephone connection (MacDonald 1998) whereas *audio conferencing* refers to interpersonal voice communication between two or more people via electronic communication technology (Cookson and Chang 1995). Chute (2003) explains that audio teleconferencing uses conventional telephone lines that are networked together to provide an interactive, shared-audio space between instructor and learner.

Both audio learning and audio conferencing fit the United States Distance Learning Association's (2005) definition of distance learning, which is "the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance." Moore (1994) notes that audio conferencing is pedagogically learner centered and is an undervalued means of communication in distance education. Hackman and Walker (1990) found that distance education students felt as though they learned more when their instructor used phone calls to express caring and provide specific feedback. Dymock and Hobson (1998) report on the successful use of voice mail as a means to enhance the functioning of collaborative learning groups at the University of New England.

The main theoretical framework underlying this study is the concept of transactional distance, conceived by Moore (1983) as "a distance in the relationship of the two partners in the educational enterprise" (155). He defined the construct in terms of the relationship between dialogue, structure, and learner autonomy. Thus, distance education consists of distance teaching, which requires structure and dialogue, as well as learner autonomy, which requires the learner to exert a certain level of control over himself (self-direction) and over his learning environment. Saba and Shearer (1994) note that transactional distance decreases when dialogue increases and structure decreases. In this study, the telephone is seen as a creative tool to mediate the transactional dialogue between institution and learner as well as a means to share control between instructor and learner with regard to teaching and learning.

Also underlying this research is the concept of instructor immediacy, defined as communication behaviors that enhance closeness and reduce psychological distance between learners (Mehrabian 1981; Myers, Zhong, and Guan 1998). In the traditional classroom, instructor immediacy has both verbal (choice of words and tone of expression) and nonverbal (gestures and proximity) manifestations. However, these behaviors and emotions are difficult to convey online and students' feelings can be more easily hurt (Wang, Sierra, and Folger 2003). In the absence of face-to-face contact and ordinary nonverbal clues, online students need more frequent interaction and reassurance in dialogue with their professors (Brown 1998). A number of studies suggest that online students who have a dynamic relationship with professors attain higher levels of learning (Anderson and Garrison 1995; Woods and Baker 2004; Woods and Ebersole 2003). Irani (1998) found that as the levels of interaction increased, students' satisfaction and outcomes in the course increased.

High dropout rates are a constant challenge in online courses, and Chyung, Winiecki, and Fenner (1998) found that students' satisfaction with their first or second courses in an online program was the major determinant about whether or not to continue in the program. The study found that 42% of the students who dropped out expressed dissatisfaction with the learning environment as the reason.

However, the measurement of satisfaction within a college setting has been difficult because of the various ways satisfaction can be viewed, the nature of the education industry, and confusion about who the customer is (Saunders and Walker 1993). It is generally agreed that for the instructional process to improve, the needs and wants of students must be identified (Hittman 1993; Shim and Morgan 1990; Turner 1995). For this study, satisfaction is defined as an emotional response that can be induced by actual product, service, or process quality or some combination of product and service quality (Browne et al. 1998).

Method

To measure satisfaction, the expectancy disconfirmation paradigm originated by Oliver (1980) was used. According to this model, consumers of goods or services form pre-consumption expectations, observe product or service performance, and compare these observations with their prior expectations. The result of this comparison is confirmation or disconfirmation of expectations, an intermediate step to satisfaction (Oliver and

DeSarbo 1988). Once students enter a course, they begin to accumulate information about actual benefits and costs. When compared with expectations, this information is likely to be a major determinant of a student's satisfaction with the course (Grady et al. 1996). Gains that are lower than expected or costs that are higher than expected may leave students dissatisfied. Conversely, higher-than-expected gains or lower-than-expected costs are generally associated with greater satisfaction.

This study addresses the following hypotheses:

Hypothesis 1: Within the group of respondents, there is a positive association between level of student satisfaction and whether a student received a phone call from his or her instructor.

Hypothesis 2: Within the group of respondents, there is a positive association between grade and whether a student received a phone call from his or her instructor.

To determine the extent to which learner–instructor telephone interaction impacts students' levels of satisfaction with online courses, a questionnaire was administered to selected students in the Iowa Community College Online Consortium at the beginning and end of the spring 2005 semester. This questionnaire was based on the general principles of disconfirmation described previously. The questions followed the methodology of the service quality (SERVQUAL) questionnaire (Parasuraman, Zeithaml, and Berry 1985, 1988).

Measurement

SERVQUAL was developed to measure service quality as perceived by the customers who use the service. It is comprised of five areas: tangibles (facilities and equipment), reliability (dependability), responsiveness (promptness and willingness to help), assurance (courtesy and ability to inspire trust), and empathy (caring and attention). Levels of satisfaction are determined by comparing expectations of quality before the service is provided with perceptions of quality after the service is delivered. This difference is known as a gap score.

The pre-course questionnaire consisted of 21 expectation and 10 demographic questions. The end-of-course questionnaire converted the same 21 expectation questions into perception format. To measure student achievement, this study used course grades that were provided by program administrators. The treatment consisted of a personal telephone

call made from the instructor to the student. The concept of teaching presence (Garrison, Anderson, and Archer 2000) was incorporated into the design as instructors were directed to discuss issues related to course organization and expectations and offer words of encouragement, caring, and support. Students were surveyed in the first two weeks of the course and again at the end of the semester before they received their grades.

The online consortium consists of seven community colleges and offers more than 200 online courses each semester. Invitations to participate in the project were sent to randomly selected faculty in all seven colleges. Sixteen instructors, representing five colleges, volunteered to participate in the study. Courses taught by these instructors included American history, music history, counseling skills, statistics, human growth and development, English literature and composition, business law, and psychology of gender. Multicourse studies such as this provide methodological benefits such as external validity and increased statistical power (Marks, Sibley, and Arbaugh 2005).

The students enrolled in these courses were then asked to volunteer for the study. Of a total of 348 students registered, 229 agreed to participate in the study, a response rate of 65.8%.

Of these, 98 were randomly assigned to receive a call from the instructor. Ultimately, 66 students successfully received a telephone call and completed before and after surveys. In addition, 131 students from the control group completed before and after surveys successfully. Those with missing data about expectations and/or perceptions were not considered. Ultimately, 197 surveys were usable.

Analysis

To determine the impact of a telephone call on satisfaction, the first step was to utilize coefficient alpha to confirm the internal consistency of the data. Computation of coefficient alpha was executed for the “before (expectation)” and “after (perception)” questions. The results were 0.9675 and 0.9669, respectively. Additionally, separate computations of coefficient alpha were executed for each identified dimension to ascertain the extent to which survey items have common factors. Table 1 shows the alpha coefficients.

In order to address Hypothesis 1, chi-square procedures were used to calculate measures of association. Chi-square is appropriate for use with nominal and ordinal variables. The variables satisfaction and

Table 1. Alpha Coefficients

	Tangibles	Reliability	Responsiveness	Assurance	Empathy	OVERALL
Expectations	0.8509	0.9020	0.8667	0.8879	0.9070	0.9675
Perceptions	0.7963	0.9217	0.8021	0.8918	0.9056	0.9669
OVERALL	0.8053	0.8908	0.8433	0.8691	0.8958	0.9670

Table 2. Phone Call Versus Satisfaction: Chi-square Test for Independence and Homogeneity

	Satisfied	Not Satisfied	Totals
<i>Observed Values:</i>			
Call	36	19	55
No call	92	50	142
	128	69	197
<i>Expected Values:</i>			
Call	35.74	19.26	55.00
No call	92.26	49.74	142.00
	128.00	69.00	197.00
0.008 = chi-square			
1 degree of freedom			
.9300 = significance			
0.006 = Cramé's V			

phone call were cross-classified and are shown in the contingency table (Table 2). For this particular test, all questions from the survey were used. The disconfirmation (gap) scores were used as the measure of satisfaction. When perceptions met or exceeded expectations, satisfaction was indicated. Therefore, positive or zero gap scores indicated satisfaction, and a negative gap score indicated dissatisfaction.

The test is for both independence and homogeneity. Table 2 shows that call and satisfaction are independent of each other (independence) and that the proportions of students who belong to the call/no call categories are the same in both satisfied/unsatisfied categories (homogeneity). In other words, the call had no effect on the level of satisfaction reported by the students. A *t* test using the gap scores was also conducted with similar results ($t = -0.547, p = .585$). Hypothesis 1 is not supported.

To determine the impact of the telephone call on student achievement, Hypothesis 2 was tested using a chi-square contingency test between grades and phone calls. Because three of the ten expected values are less than five, and expectation cells less than five often give unreliable results, it was decided to do the analysis based on a consolidated table. This test was set up by combining grades A and B as well as D and F. The grade of C remained unchanged. The results are in Table 3.

We found that those who received telephone calls tended to get grades different from those who did not get phone calls. The average course grades (on a GPA basis) of those who were called ($M=1.56$, $SD=0.74$) tended to be slightly lower than the grades of those who were not called ($M=1.80$, $SD=0.92$). The relationship is counterintuitive and opposite the results hypothesized. No cause and effect is implied, although a number of factors could have caused this result. Among these are biological and psychological processes that vary with the passage of time and can affect outcomes. These can include even short-term processes such as boredom and fatigue (Campbell and Stanley 1966). This type of event would need to be addressed in future research. For example, disillusionment with course or instructor over time might, or might not, be evident. If any of these events occurred, they could cause misinterpretation of results. Occurrence of any of these events could be the reasons we got counterintuitive results (slightly lower grades among the group that received the phone calls). Hypothesis 2 is not supported.

Table 3. Phone call Versus Grades: Chi-square Test for Independence

	A-B	C	D-F	Totals
<i>Observed Values:</i>				
Call	4	24	27	55
No call	31	47	64	142
	35	71	91	197
<i>Expected Values:</i>				
Call	9.77	19.82	25.41	55.00
No call	25.23	51.18	65.59	142.00
	35.00	71.00	91.00	197.00
6.090 = chi-square				
2 degrees of freedom				
.0476 = significance				
0.176 = Cramér's V				

Discussion and Conclusion

In an effort to improve the quality of online courses, a growing number of colleges and universities are adopting the telephone as a simple and creative way to overcome the textual dominance of online learning. The aim of this study was to determine whether improved faculty-to-student communications in the form of a personal phone call during an online course would have a positive effect on student satisfaction and achievement.

The analysis reported led to two primary conclusions. First, the majority of students (65%) rated their online experience as having exceeded their expectations (see Table 2), but with respect to the communications issue, statistical tests yielded no evidence that the phone call had an effect on student satisfaction. Second, this study found a statistically significant effect between phone call and grade. The grades of the students who received a phone call were slightly lower than the grades of those who did not receive a call.

One explanation may be that the telephone call took place at the beginning of the semester when the student had few course content questions. Another explanation is that it takes more than one phone call to establish a meaningful and beneficial relationship between instructor and student. This result could also have been the effect of extraneous variables of the type mentioned previously. The grade difference, however, is minimal. Based on Cramér's V as a measure of effect size ($V = 0.176$), this finding may not be of practical significance, but it merits further research.

The design selected for this study is a pre-experimental design called a "one-group pretest–posttest design." It is characterized by an observation followed by an intervention (phone call) and then another observation of the same participants. This type of design is widely used in educational research; however, it is subject to the effect of extraneous variables. Such extraneous variables can cause plausible counters to the hypothesis that the intervention caused any difference between the pre- and post-observations (Campbell and Stanley 1966). Participants were volunteers and not randomly selected. Nonrandom selection of participants is the nature of this design. These results, therefore, are limited to the group studied.

The findings of this study suggest that online courses generally meet students' expectations and that attention to service quality will have a good outcome. Future researchers may follow up on these findings by increasing the number of phone calls between instructor and student while bearing in mind that satisfaction is only one source of pedagogical evaluation and should be compared with other measures of effectiveness.

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