Students And Faculty Perceptions Of Communications Channels: A Comparison Of Survey Results

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ABSTRACT

Individual communication between faculty and students outside of the classroom is one of the cornerstones of education. This survey examines the students and faculty perceptions of three communications media for several communication tasks that occur between students and faculty. A random sample of 449 students (undergraduate and graduate, full-time and part-time) which represents 10% of the population at a small Texas state university were invited to participate in a survey that elicited their perceptions on the effectiveness of face-to-face (office hours), e-mail and telephone communication. Similarly a random sample of 49 professors, which represents 32 % of the faculty population, was used to test several hypotheses. In this survey, the relevant results supported by some nonparametric statistical analyses are that at each media channel the "bootstrapped" confidence intervals estimates for the percentages in communications-time preferences of students and faculty were very similar, or without a significant difference. In addition, students and faculty expressed simultaneously (criteria of convergence) the same preference-level about e-mail for convenience and efficiency. Office hours were preferred for confidentiality, confrontation and emotional support. Equal preference about e-mail and office hours was expressed by both groups of study for the criteria: accuracy and overall effectiveness.

INTRODUCTION

Teaching involves the transfer of knowledge at two levels – group communication and personal communication. This paper examines the perceptions of the students at a small state university for individual communication with faculty outside of the classroom environment, in terms of the effectiveness of personal communication in a face to face, e-mail, and telephone context.

The traditional approach to personal communication between faculty and students has been through face to face communication, usually in the form of Office Hours. Virtually all faculty at the college level hold scheduled Office Hours, which may be supplemented by appointments. Telephonic communication has also been available. In recent years, the communications revolution which has occurred because of the wide spread availability of computers and e-mail has had some impact upon the personal communication between faculty and students.

Research into the choice of communication channels falls into two perspectives [Marcus 1994]. The first perspective focuses on the communication channel itself, as in [Daft 1986]. The second perspective focuses on the social context of the communication [Falk 1987].

Other research indicates factors not considered by these primary streams. In a study of managers and executives, Carlson determined that executives selected communications media either by the ease of use or by the richness or social presence of the media [Carlson 1998]. In other research, Gefen and Straub found that women perceived e-mail as richer than their male counterparts [Gefen 1997].

One shortcoming of these perspectives is that they focus on the selection process used by the sender of the communication, instead of the receivers of the communication [Sifkin 1992]. In faculty to student personal communications, the selection of a communication channel is usually made by the students as the senders of communication. However, the faculty has a significant input to the selection process because of the difference in status. Because of this difference, it is hoped that this research will widen the current body of communication research.

When considering the choice of a communications channel, three factors that must be evaluated are the richness of the communication channel, the immediacy of the channel, and the social context of the task to be performed by the communication. We will next consider these factors.

RICHNESS OF COMMUNICATION CHANNELS

Face to face communication is considered to be the richest of these communication channels. As face to face communication uses all of the senses, gives immediate feedback, and is more spontaneous, it is the richest of these communication channels [Durlak 1987]. In addition to words, communication is performed by facial expression, body language and clothes. The expression of humor and sarcasm are far easier to convey in face to face communication.

Telephone communication is the next richest of the communication channels studied. Besides words, communication is enhanced by the inflection of the speaker's voice. Humor and sarcasm are less apparent, but are still perceivable.

e-mail filters out all but verbal clues to meaning [Karahanna 1999]. e-mail communication is limited to words, so it is the least rich of the studied communication channels. Words are the predominate means of communication. Emoticons may be used to indicate emotional components, such as humor, but with less richness than the spoken word.

IMMEDIACY OF COMMUNICATION CHANNELS

Both face to face and telephone channels receive immediate responses after they have been initiated because of their synchronous nature. However, this assumes that the communication has been successfully initiated. A student has to wait until the scheduled opportunity (usually office hours) to initiate the communication. Often, this requires a wait of several days.

e-mail is asynchronous because of its unscheduled nature. The student first sends the e-mail, and then waits until the faculty member receives the communication and responds. The waiting period may be from seconds to days, depending on the circumstances. On the other hand, e-mail is not bound by geographical constraints, so a student and faculty member may be in different countries and have rapid communication.

Privacy of e-mail communications may be problematic [Clyde 1999], especially when traveling. The perception that the University may read a faculty members e-mail was reported by as many of 50% of the faculty members in one survey [Beheruz 1999].

SOCIAL CONTEXT OF COMMUNICATION TASKS

Selection of a communication channel has many components. As many types of communication take place between faculty and students, different channels may be selected for different types of communication.

In a 2000 survey, Johnson et. al. classified the choice of communications media by the following tasks: social presence, uncertainty reduction, appraisal, social information processing, decision making, and cost reduction [Johnson 2000]. They measured the perceived value of written, interpersonal, and e-mail for these tasks.

Social information processing takes the position that workers construct their own interpretations of the work place and that the individual's social environment impacts on the selection of communications channels [Karahanna 1999]. Some of the characteristics of this task are imparting the feeling of group membership, representing diversity of viewpoints, and providing information that can be passed to others. e-mail (.87) was rated higher than written (.80) and interpersonal (.71) communication.

Uncertainty reduction involves tasks such as providing a wealth of information, minimizing communication breakdowns, and satisfying curiosity. e-mail (.93) was rated highest, followed by interpersonal (.86) and written (.84) communication.

Appraisal involves the perceptions of the receiver in the choice of the communications media. Credibility has been judge to be an important determinant of communication channels for upward flow of information in an organization [Glauser 1984]. Appraisal considerations include clarity and accuracy of information. e-mail (.83) was rated highest, followed by written (.66) and interpersonal (.63) communication.

Social presence indicates the degree to which a channel simulates face to face communication [Durlak 1987]. Some of these characteristics evaluated were personal touch, ability to socialize, providing the personal touch, and allowing the receiver to get to know someone. Interestingly, e-mail (.88) was rated highest in this context, followed by interpersonal (.72) and written (.72) communication.

Cost minimization is determined by three factors: access, errors, and delays [Reinsch 1990]. Effort costs can be associated with the distance between the two parties [Trevino 1987], familiarity with the channel [Steinfeld 1987] and length and complexity of the message [Daft 1984]. In these tasks, interpersonal communication (.80) was rated highest, followed by e-mail (.78) and written (.69).

Decision making by the group is the final task considered by Johnson. The components of this task are 1) the media is goal directed, 2) receivers select different media to meet their needs, 3) individuals initiate channel selection and 4) there are multiple sources of needs and each channel competes with the others to satisfy the need. Interpersonal communication (.78) was rated highest, followed by written (.53) and e-mail (.48).

In the next section, we will examine student – faculty communication and develop hypotheses about the impact of communications channel choice on the various components of these communications.

STUDENT – FACULTY COMMUNICATION

Timeliness is an important component of any communication. In this environment, it must be recognized that students do not have unfettered access to faculty. Many faculty members are available to students only during scheduled office hours. However, many faculty members will answer e-mail outside of office hours.

H₁: e-mail will be considered as the most timely communication channel.

The accuracy of the communication is of paramount concern. In face to face communication, the richness of the channel offers more clues as to the meaning conveyed. However, no documentation of the conversation is created except for when the student takes notes. e-mail is inherently self-documenting.

H₂: e-mail will be considered as the most accurate communications channel.

The convenience of the communications channel is important to both parties. It may be very difficult for the student to be present during office hours because of work or other classes. It is not always possible to make alternative arrangements for face to face or telephone communication. e-mail may be received or sent in an asynchronous manner without a pre-arranged meeting time and place.

H₃: e-mail will be considered the most convenient communications channel.

Retaining the contents of the communication is also very important. The student may not ask all of the relevant questions or remember all of the responses. E-mail, as mentioned previously, is inherently self-documenting.

H₄: e-mail will be considered as the channel offering the best retention.

Another aspect of communication is confidentiality. While most office hours are held in private, other students may overhear the conversations between student and faculty. e-mail may be read by other students, especially if it is received in a public place such as a computer lab, but the student is in control of the receiving environment.

H₅: e-mail will be considered as the most confidential communications channel.

Another reason for student – faculty communication is for the turning in of previously assigned work to the student. This may be accomplished during office hours or by e-mail. However, as no actual interaction is required by this task, it is probably more convenient for both student and faculty to perform this task by e-mail.

H₆: e-mail will be the preferred channel for turning in previously assigned work.

Students and faculty often interact about the assignment of work. In some cases, this simply involves the student receiving the assignment, which may be performed at a class meeting. It is often the case that there is considerable interaction and discussion about the assignment. As e-mail is asynchronous, it may take many e-mail communications for the assignment to evolve.

H₇: Face to face communication will be the preference for turning in work.

In many circumstances, it may be necessary for the student and faculty to achieve a consensus about the assignment. Face to face communication allows for rapid evolution of the task, where e-mail may involve considerable delays in reaching a consensus.

H₈: Face to face will be the preferred channel for reaching a consensus.

Some meetings between students and faculty involve a confrontation. In face to face communication, it is possible that emotions will be involved. E-mail, by its asynchronous nature, allows each party to restate their positions before communication them.

H₉: e-mail will be the preferred channel for confrontational meetings.

It may also be necessary to offer emotional support to students, especially when the student's performance is below their expectations. The richness of face to face communication enable faculty to respond more appropriately than e-mail.

H₁₀: Face to face communications will be preferred for receiving emotional support from faculty or mentors.

H₁₁: e-mail will be the preferred media for overall communication with faculty.

The choice of communications channel is affected by the familiarity of the sender with the channel [Rice 1993]. As younger students are more likely to be technologically adept, it is likely that they will show a higher preference to e-mail communication.

H₁₂: Younger students will show a higher preference for e-mail for all criteria (timeliness, accuracy, etc.).

e-mail allows the communication to be performed at a distance. Undergraduate students are less likely to wish to perform direct communication with faculty as they may be more intimidated than more experienced students. From the graduate students' perspective, e-mail would seem more appropriate for communications with faculty than

undergraduate students because of the volume of communication and the depth of the topics covered by the communication.

H_{13} e-mail: Graduate students will show a higher preference for e-mail than undergraduate students, this is $E(x_{\text{Graduate}}) > E(x_{\text{Undergraduate}})$.

We can extend this research hypothesis to the other communication channels, for which the preference's orientation would be lower or higher; thus, in general we have:

H_{13} : For some criteria, graduate students will show a significant different preference for a specific channel than undergraduate students, this is $E(x_{\text{Graduate}}) \neq E(x_{\text{Undergraduate}})$.

To compare the preferences in communications-time per media channel we decide to test the null hypothesis: $\pi_{\text{students.channel}_k} = \pi_{\text{faculty.channel}_k}$; then, we have:

H_{14} : For the same media-channel, students will show a significant different preference in communications-time than faculty.

An alternative to test the null hypothesis $H_{14,0}$: For the same media-channel, students and faculty will show the same percentage preference in communications-time, is to evaluate nonparametric confidence intervals (via the bootstrapping method) for the differences between population percentages of both groups of study. Thus, by inspection we can review if **zero** is within the confidence interval to support $H_{14,0}$ otherwise will be rejected.

DATA AND METHODOLOGY

Sampling

A random sample of size $n = 449$ was used to test several hypotheses. The sample represents 10.25 % of all student population ($N=4379$ during the Fall-2004 semester) at Texas A&M International University. The survey (shown at the end of this paper as Appendix A) was pilot tested by a small group of Management of Information Systems and Decision Science students before its administration. It was previously used to survey the faculty of the same university [Pena-Sanchez and Hicks 2006]. Where a random sample of size $n = 49$ was used to test similar hypotheses; this last sample represents 32 % of the entire faculty population ($N=153$) at TAMIU. Also, the survey (shown at the end of this paper as Appendix B) was pilot tested by a small group of Management of Information Systems and Decision Science faculty before its administration.

Statistical Techniques

Given that the majority of the independent variables are in categorical (nominal) scale, and the fact that dependent variables do not meet the parametric F-test assumptions like normality and homocedasticity of the variances, the statistical techniques used consist of some nonparametric methods based on ranks such as, the Mann-Whitney test, the Kruskal-Wallis test, the Friedman test, and the Spearman rank correlation coefficient test; and for the case of contingency (cross) tables, the analysis is performed via the Chi-square test.

The Friedman Test

The test that can be used under the assumption of independence between samples is Kruskal-Wallis, this is assuming that students were rating in independent form each media channel (office hours, e-mail, & phone) for each criterion (timeliness, accuracy, etc.); but taking in consideration the fact that the data are composed by related samples, given that for each criterion, the three ratings (one for each media channel) belong to the same "student", then the appropriated statistical contrast is the Friedman test, using "student" as a blocking factor.

The involved hypotheses in the case of the Friedman test, (given b blocks and k treatments) are:

H_o : Each ranking of the random variables within a block is equally probable.

H_a : At least one the groups of classification (treatments) tend to yield larger observations than at least one of the other groups of classification.

Multiple comparisons. If the null hypothesis is rejected, we may use the following procedure [Conover 1999] to evaluate which pairs of treatments tend to differ. Thus, we can affirm that treatments i and j seem to be different if the following inequality is satisfied.

$$R_i - R_j | > t_{1-\alpha/2} [2b(A-B) / (b-1)(k-1))]^{1/2} \quad (1)$$

Where R_i and R_j are the rank sums of the two samples, $t_{1-\alpha/2}$ is the $\{1 - \alpha/2\}$ quantile of the t distribution with $(b-1)(k-1)$ degrees of freedom. The value for alpha (level of significance) is the same one used in the Friedman test. The values A and B appear expressed below; this procedure is repeated for all the pairs of treatments. The test statistic T_f is defined as

$$T_f = (k-1)[bB - b^2k(k+1)^2/4] / (A - bk(k+1)^2/4) \quad (2)$$

Where,

$$A = \sum \sum R(X_{ij})^2, \quad i=1, 2, \dots, b; \quad j=1, 2, \dots, k \quad (3)$$

$$B = (1/b)\sum R_j^2, \quad j=1, 2, \dots, k \quad (4)$$

$$R_j = \sum R(X_{ij}), \quad i=1, 2, \dots, b \quad (5)$$

The statistic T_f is compared with quantiles from the chi-square distribution with $k-1$ degrees of freedom.

The Spearman Rank Correlation Coefficient ρ (Rho)

This coefficient estimate can be used to test for independence between two random variables. The hypotheses take the following form

H_o : The variables X and Y are mutually independent

H_a : There is a tendency for the larger {smaller} values of X to be paired with the larger values of Y, or vice versa.

The test statistic T_r is defined [Conover 1999] as

$$T_r = \sum [R(X_i) - R(Y_i)]^2, \quad i=1, 2, \dots, n \quad (6)$$

Then ρ is obtained as follows

$$\rho = 1 - (6 T_r / (n^3 - n)) \quad (7)$$

The Mann-Whitney Test

This contrast is used in the case of two independent samples. Let $F_1(x)$ and $F_2(x)$ be the distribution functions corresponding to populations 1 and 2 respectively; the hypotheses involved are

$$H_o: F_1(x) = F_2(x) \text{ for all } x$$

$$H_a: F_1(x) \neq F_2(x) \text{ for some } x$$

The Mann-Whitney U statistic is defined [Cooper 2001, pp. 742] as

$$U = \text{smaller } \{U_n, U_m\} \quad (8)$$

Where,

$$U_n = nm + (n(n+1)/2) - R_n \quad (9)$$

$$U_m = nm + (m(m+1)/2) - R_m \quad (10)$$

And where, R_n and R_m are the sum of ranks used in the two samples of size n and m respectively.

Bootstrapping Method

This nonparametric method is based on a re-sampling process, in which the original data are repeatedly sampled with replacement to generate a large bootstrap sample for model estimation. Thus, the confidence interval estimates for the parameters are no longer evaluated under statistical (parametric) assumptions, but instead are calculated using the bootstrapped (empirical) observations.

RESULTS OF THE SURVEY

Table 1 shows the distribution composition for the students sample participating in the survey. This distribution is fairly consistent with the students' population distribution at the studied university.

Table 1
Frequencies Composition For The Students' Sample (Values In Parentheses Are The Percentages)

Category	Undergraduate	Graduate	Total
Full time	212 (42.00)	76 (22.14)	288 (64.14)
Partial time	82 (23.48)	79 (12.38)	161 (35.86)
Total	294 (65.48 %)	155 (34.52 %)	449 (100 %)

Table 2 shows the distribution of the faculty academic ranks participating in the survey. This distribution is also fairly consistent with the distribution of academic ranks at the studied university.

Table 2
Frequency Description For The Faculty Rank

Faculty rank	Frequency	Percentage
Lecturer	7	14.3
Adjunct	6	12.2
Assistant	22	44.9
Associate	8	16.3
Full	6	12.2
Total	49	100 %

Table 3
Percentage Of Communications Time About Course Work Per Media Channel, Out Of The Classroom Environment

Perceived by	Office hours	e-mail	Phone	Fax	Total
Students	39.60	44.05	16.35	0	100 %
Faculty	44.53	41.29	14.02	0.16	100 %

Table 3 shows the distribution of communications between students and faculty that occur out of the classroom environment. This table shows that office hours (face to face) and e-mail are the dominant media of communication for both groups of study (students & faculty).

Table 4
95% Nonparametric Confidence Intervals
For The Difference Between Population Percentages Provided In The Previous Table 3

Channel	Difference: Students-Faculty	Interval Lower Limit	Interval Upper Limit	Decision
Office hours	-4.93	-18.72	9.19	$0 \in CI$: Do not reject $H_{14,0}$
e-mail	2.76	-12.33	17.48	$0 \in CI$: Do not reject $H_{14,0}$
phone	2.33	-7.12	12.43	$0 \in CI$: Do not reject $H_{14,0}$
fax	-0.16	-0.98	1.27	$0 \in CI$: Do not reject $H_{14,0}$

Table 4 shows that students and faculty have a similar behavior about the preferences in communications-time per media channel. The null hypothesis ($H_{14,0}$) can not be rejected because **zero** is within the confidence interval: $0 \in CI$, which occurs when the lower and upper limits exhibit opposite signs. Therefore, the true difference in percentages or proportions in communications-time preferences tend to be zero in this case.

Table 5 shows the **students** preferences for each of the tasks: e-mail was the preferred media for timeliness, convenience, efficiency, and turning in work. Office hours were preferred for confidentiality, reaching a consensus, confrontation, and emotional support. e-mail and office hours were equally preferred for accuracy, retention, and overall preference. The fourth column in this table shows comparisons for the three media channels used in the hypotheses stated earlier in the paper. H_5 (e-mail preferred for confidentiality), H_7 (office hours preferred for turning in work), and H_9 (e-mail preferred for confrontation) were not supported. The other hypotheses are supported, although the same preferences about office hours and e-mail were noted in three hypotheses. Meanwhile, for **faculty** the same preference was shown for timeliness. E-mail was the preferred media for convenience, retention, and efficiency. Office hours were preferred for confidentiality, confrontation, and emotional support. E-mail and office hours were equally preferred for accuracy, receiving work, reaching a consensus, and overall preference. The last column in this table shows the comparisons for the three media channels used in the hypotheses stated before. H_1 (e-mail preferred for timeliness), H_5 (e-mail preferred for confidentiality), and H_9 (e-mail preferred for confrontation)

were not supported. The other hypotheses are supported, although the same preferences were noted in four hypotheses.

Table 5
The P-Values For The Friedman Statistic (T_f) Test At Each Null Hypothesis:
 $H_{i,0}$: All Three Channel-Communications (Office Hours, E-Mail, And Phone) Population Distribution Are Identical
Versus The Alternative Hypothesis $H_{i,A}$

Null $H_{i,0}$ & Criteria	Students p-value	Faculty p-value	Students Preferred media (Equation (1))	Faculty Preferred media (Equation (1))
$H_{1,0}$ Timeliness	0.001	0.228	e-mail	Same preference.
$H_{2,0}$ Accuracy	0.001	0.001	e-mail & office hours	e-mail & office hours
$H_{3,0}$ Convenience	0.001	0.001	e-mail	e-mail
$H_{4,0}$ Retention	0.001	0.001	e-mail & office hours	e-mail
$H_{5,0}$ Confidentiality	0.001	0.002	office hours	office hours
$H_{6,0}$ Efficiency	0.001	0.001	e-mail	e-mail
$H_{7,0}$ Turning/Receiving work	0.001	0.001	e-mail	e-mail & office hours
$H_{8,0}$ Reaching a consensus	0.001	0.001	office hours	e-mail & office hours
$H_{9,0}$ Confrontation	0.001	0.001	office hours	office hours
$H_{10,0}$ Emotional support	0.001	0.001	office hours	office hours
$H_{11,0}$ Overall effectiveness	0.001	0.001	e-mail & office hours	e-mail & office hours

Table 6
Convergence Of Criteria Per Media-Channel From Table 5, For Students & Faculty Simultaneously

Channel	Criteria of Convergence
e-mail	Convenience & Efficiency
office-hours	Confidentiality, Confrontation & Emotional support
e-mail and office-hours	Accuracy & Overall effectiveness

Table 7
Significant Values Of The Spearman Rank Correlation Coefficient ρ Between Age And The Group Of Study's Preference Level Associated To A Specific Communication Channel Under Indicated Criteria Or Factor, To Test The Null Hypothesis $H_{12,0}$: $\rho = 0$, Versus The Alternative Hypothesis $H_{12,A}$: $\rho \neq 0$; Which Is Equivalent To Say That Younger (Or Older) Students (Or Faculty) Will Show A Higher Preference For The Indicated Channel And Under The Specified Factor; The Sample Size Was $N_s=449$ In All Students Cases, And $N_f=44$ In All Faculty Cases, As 5 Faculty Declined To Submit Their Ages.

*Factor /group of study	Channel	Statistic ρ	p-value	Decision
Retention/Students	e-mail	0.137	0.004	Reject $H_{11,0}$ at $\alpha=0.01$
Confrontation/Students	office hours	-0.096	0.042	Reject $H_{11,0}$ at $\alpha=0.05$
Confrontation/Faculty	e-mail	-0.331	0.028	Reject $H_{11,0}$ at $\alpha=0.05$

*Only significant criteria or factors (p-values ≤ 0.05) are shown.

At a significance level of $\alpha=5\%$, the survey results (p-value=0.06 in Table 8) do not provide evidence to conclude that faculty teaching to freshmen students will show a higher preference for e-mail than those that teach to graduate students; but from a practical point of view, a p-value of 0.06 indicates that the preference for e-mail of faculty teaching to graduate students tends to be higher than those that teach to freshmen students.

Table 8

Significant Values Of The Mann-Whitney Test For The Null Hypothesis $H_{13,0}$: Graduate And Undergraduate Students Will Show The Same Preference For The Indicated Channel Under The Specified Criterion. $E(X_{\text{graduate}}) = E(X_{\text{undergraduate}})$, Versus The Alternative Hypothesis $H_{13,A}$: $E(X_{\text{graduate}}) \neq E(X_{\text{undergraduate}})$; Which Is Equivalent To Say That Graduate Students Will Show A Higher Or Lower Preference For The Indicated Channel Under The Defined Criteria Than Those Students At The Bachelor Program. In Addition, We Can Assume That Faculty Teaching To Freshmen Students Will Show A Higher Preference For E-Mail Than Those That Teach To Graduate Students:
 $H_{13,0}$: $E(\text{Freshmen}) = E(\text{Graduate})$, Versus The Alternative Hypothesis $H_{13,A}$: $E(\text{Freshmen}) > E(\text{Graduate})$

Criteria*	Channel	Group of Study	Category	n	E(x)	p-value	Decision
Retention	e-mail	Students	Undergraduate Graduate	294 155	4.94 5.39	0.006	Reject $H_{13,0}$ at $\alpha=0.01$
Efficiency	Office hours	Students	Undergraduate Graduate	294 155	4.74 4.46	0.046	Reject $H_{13,0}$ at $\alpha=0.05$
Confrontation	Office hours	Students	Undergraduate Graduate	294 155	5.49 5.18	0.020	Reject $H_{13,0}$ at $\alpha=0.05$
Overall effectiveness	e-mail	Faculty	Teaching to Freshmen Teaching to Graduates	13 10	4.85 5.80	0.06	Do not reject $H_{13,0}$

$E(x)$ is the expected value or average for the preference level, on a scale from 1 (lowest) to 7 (highest); see the last set of questions in Appendix A or B.

DISCUSSION

As the Johnson survey also analyzed media selection and task, we will now contrast the findings of our survey and Johnson's [Johnson 2000].

Many of our findings support the findings of Johnson's survey. Timeliness is closely related to cost minimization, and both Johnson and this survey indicate that e-mail and interpersonal communication are ranked very similarly. Accuracy is very closely related to both uncertainty reduction and appraisal, and both this survey and Johnson find that e-mail is considered to be the most accurate media. Efficiency is closely related to cost minimization, and both this survey and Johnson found e-mail to be the most efficient media. Both Johnson and this survey found office hours to be the preferred media for decision making, which is represented in the survey by reaching a consensus.

However, not all of our findings are identical to Johnson's. In this survey, confrontational and emotional support situations showed a preference for office hours. Johnson found e-mail to be preferred for social information processing and social presence.

The survey results also support the theory that communications media are selected by the richness required by the task [Fenn 1989, Reinsch 1990, and Rice 1993]. Office-hours are the preferred communications channel for tasks requiring rich communication media, especially confrontation and emotional support, as well as confidentiality, and reaching a consensus. On the other hand, the students considered e-mail to be superior for *timeliness*, *convenience*, *efficiency* and *turning in work* (Table 5). Meanwhile, faculty considered e-mail to be superior for *convenience*, *efficiency* and *efficiency*.

According to Table 7, there is no significant statistical relationship between students' age and the majority of criteria given the three different communications media, except for confrontation when the selected communication channel is office hours and retention when e-mail is used. Meanwhile there is no significant statistical relationship between faculty's age and communication media preference, except for confrontation criterion when e-mail is used.

This survey also covered tasks which are not directly correlated to tasks in Johnson's survey. This survey indicates that e-mail is perceived for students and faculty simultaneously to be the most convenient media and also the best media for efficiency of the communication; office hours is perceived to be the best media for confidentiality,

confrontation & emotional support; and office hours and e-mail together are considered the best medias for accuracy & overall effectiveness of the communications (Table 6).

LIMITATIONS OF THE SURVEY

The survey is limited by the sample size; however, the sample size is sufficient for the statistical techniques used by the authors.

The survey is also limited by the characteristics of the sample population. All of the survey participants are students and faculty at one university. This e-mail system used by this university has only recently been accessible from off campus. In addition, the university services a population which is characterized by low income, which implies that some students will not have external e-mail access for communicating with their faculty. These two characteristics may cause the survey to understate the importance of e-mail.

CONCLUSIONS

Our conclusions supported by the nonparametric statistical analysis are that students expressed a preference for e-mail under criteria: timeliness, convenience, efficiency, and turning in work. Office hours were preferred for confidentiality, reaching a consensus, confrontation, and emotional support. Equal preferences for e-mail and office hours were expressed for accuracy, retention, and overall effectiveness (Table 3).

Except for retention (when the communication is by e-mail, with a p-value=0.004) and confrontation (when the communication is by office hours, with a p-value=0.042); after these, we did not find other significant relationships between age and the rest of the mentioned criteria. From Table 5, there is a positive significant correlation between age and retention when the preferred media is e-mail; thus, as the students' age increases they tend to prefer e-mail for *retention* purposes. An opposite situation occurs with confrontation (negative correlation); here, as the students' age decreases they tend to prefer office hours (face-to-face) for *confrontation* purposes.

The survey results in Table 6 provide evidence to conclude that graduate students have been show a higher appreciation for e-mail than undergraduate students for *retention* (p-value=0.006) purposes; but, for *efficiency* (p-value=0.046) and *confrontation* (p-value=0.020) the results went in another direction, here undergraduate students showed a higher favoritism for office-hours than undergraduate students.

As a result of the statements presented in the managerial implications section, and supported by empirical evidence (Table 4), and because "better retention" under *timeliness* or time-sensitivity [Samtani 2003] restrictions means "better learning" [McEntee 1997], therefore we can conclude that the e-mail can be conceived as an innovative e-learning tool.

DIRECTIONS FOR FURTHER RESEARCH

These findings should impact both managers and educators and their choice of communications media. As educators, we all should seek the most effective and efficient media for the various communication tasks. The importance of communication between employees as well as faculty and students outside of the classroom environment should provide ample motivation for additional research into this topic.

This survey is limited in scope, and should be expanded to cover a larger sample of students. The demographics of the studied population may not be typical of the entire educational environment. The culture studied by this survey may be atypical, or further research may find that there a number of sub-cultures within an organization or university, each with its own communications practices.

This survey indicates that e-mail is becoming a more important media for communications. Further research is needed into the effectiveness of various communications media and tasks so that both students and faculty may communicate more effectively.

It is hoped that this paper will foster more research into the relationships between communications media and tasks, so that more effective and efficient communications will occur both in organizations and universities.

As reference of the importance of e-mail in communication: Second-by-second the number of organizations making use of e-mail are shown an expanding increase in a geometrical form. According to a study the following results were evaluated:

<u>Year</u>	<u>Number of e-mails being sent</u>
1995	101 billion e-mails were sent
2000	2.6 trillion e-mails were sent

(Source: <http://www.mybestdocs.com/mitchell-l-email-v5.htm>) [Mitchell 2002])

This is an increase of almost 26 fold over a five year period.

APPENDIX A

(The cover letter is not shown)

Student Perceptions of Communication Media Survey

1. What is your student classification by the program that you are currently pursuing?

Undergraduate____ Graduate____

2. What is your student classification by time? Full time____ Partial time____

3. What is your gender? Male____ Female____

4. What is your age? ____ Years

5. How many electronic addresses (e-mail addresses) do you have?

0____ 1____ 2____ 3____ Another number ____

6. Which was your GPA upon concluding the prior semester? _____ GPA

7. Do you have a computer with INTERNET at home? Yes____ No____

8. Do you have a computer with INTERNET at your work place? Yes____ No____

9. How often do you use e-mail?

Do not use e-mail____ once a day____ twice a day____
three or more per day____ once a week____ twice a week____ once a month____

10. What is your major?

____ College of Nursing

____ College of Arts and Sciences

____ Language and literature

____ Psychology and Sociology

____ Social Sciences

____ Fine and Performing Arts

____ Mathematical and Physical Sciences

____ Biology and Chemistry

____ College of Business Administration

____ MIS and Decision Sciences

____ Accounting, Finance, and Economics

____ Management, Marketing, and International Business

College of Education

_____ Curriculum and Instruction

_____ Professional Programs

_____ Special Populations

_____ No Major

11. What average percentage of your communication with faculty about course work out of the classroom is by

Office Hours _____ E-mail _____ Telephone _____ Fax _____ (Please, sum =100 %)?

Rate each of the communication media on a scale of 1 to 7,
with **1 being lowest** and **7 being highest**:

UNIMPORTANT 1 2 3 4 5 6 7 VERY IMPORTANT

Please, according to your perception, rate the following questions:

12. How do you rate each media for **timeliness**?

Office Hours _____ E-mail _____ Telephone _____

13. How do you rate each media for **accuracy** of the communication?

Office Hours _____ E-mail _____ Telephone _____

14. How do you rate each media for **convenience**?

Office Hours _____ E-mail _____ Telephone _____

15. How do you rate each media for **retention** of the communication?

Office Hours _____ E-mail _____ Telephone _____

16. How do you rate each media for **confidentiality**?

Office Hours _____ E-mail _____ Telephone _____

17. How do you rate each media for **efficiency** in assigning new work?

Office Hours _____ E-mail _____ Telephone _____

18. How do you rate each media for **turning in** work?

Office Hours _____ E-mail _____ Telephone _____

19. How do you rate each media for **reaching a consensus** between student and faculty?

Office Hours _____ E-mail _____ Telephone _____

20. How do you rate each media for meetings where a **confrontation** is possible?

Office Hours _____ E-mail _____ Telephone _____

21. How do you rate each media for meetings where you may need **emotional support**?

Office Hours _____ E-mail _____ Telephone _____

22. How do you rate each media for **overall effectiveness** in communication?

Office Hours _____ E-mail _____ Telephone _____

APPENDIX B

(The cover letter is not shown)

Faculty Perceptions of Communication Channels Survey

1. What is your academic rank?

Lecturer____ Adjunct____ Assistant____ Associate____ Full____

2. What is your gender? F____ M____

3. What is your age? ____ years

4. What college / department do you teach in?

____ College of Nursing

____ College of Arts and Sciences

____ Language and literature

____ Psychology and Sociology

____ Social Sciences

____ Fine and Performing Arts

____ Mathematical and Physical Sciences

____ Biology and Chemistry

____ College of Business Administration

____ MIS and Decision Sciences

____ Accounting, Finance, and Economics

____ Management, Marketing, and International Business

____ College of Education

____ Curriculum and Instruction

____ Professional Programs

____ Special Populations

5. Which of the following are included in your syllabus?

____ E-mail

____ Office Phone

____ Fax Phone

____ Home Phone

6. How many hours of scheduled office hours do you have per week? ____

7. What percentage of the total time allocated for office hours have you spent with students in course related discussions? ____%

8. What percentage of your student – faculty communication about course work out of the classroom is by?

(Please break down the percentages by courses taught; row sum=100%):

Course	Office hours %	e-mail %	Phone %	Fax %

Please rate each of the communication media on a scale of 1 to 7: UNIMPORTANT 1 2 3 4 5 6
7 IMPORTANT with 1 being lowest (unimportant) and 7 being highest (important), for the following questions

9. How do you rate each media for **timeliness**?

Office Hours _____ E-mail _____ Telephone _____

10. How do you rate each media for **accuracy** of the communication?

Office Hours _____ E-mail _____ Telephone _____

11. How do you rate each media for your **convenience**?

Office Hours _____ E-mail _____ Telephone _____

12. How do you rate each media for **retention** of the communication (after 2 or 3 weeks)?

Office Hours _____ E-mail _____ Telephone _____

13. How do you rate each media for **confidentiality**?

Office Hours _____ E-mail _____ Telephone _____

14. How do you rate each media for **efficiency** in assigning new work?

Office Hours _____ E-mail _____ Telephone _____

15. How do you rate each media for **receiving** work from students?

Office Hours _____ E-mail _____ Telephone _____

16. How do you rate each media for **reaching a consensus** between student and faculty?

Office Hours _____ E-mail _____ Telephone _____

17. How do you rate each media for conducting meetings where a **confrontation** is likely?

Office Hours _____ E-mail _____ Telephone _____

18. How do you rate each media for meetings in which you will be providing **emotional support** or motivation to students?

Office Hours _____ E-mail _____ Telephone _____

19. How do you rate each media for **overall effectiveness** in communication?

Office Hours _____ E-mail _____ Telephone _____

BIBLIOGRAPHY

1. [Beheruz 1999] Beheruz, S., Barnes, C., Burst, M., Kaye, L. E-Mail Communications in Colleges: Are they private?, *Journal of Education for Business*, Vol. 74, Iss. 6, Jul/Aug 1999, pp. 347-350.
2. [Carlson 1998] Carlson, P. J. and Davis, G. B. An investigation of media selection among directors and managers: From “self” to “other” orientation, *MIS Quarterly*, Vol. 22, No. 3, Sept. 1998, pp. 335-352.
3. [Clyde 1999] Anne The Traveler’s Guide to E-Mail Access, *Teacher Librarian*, Vol. 27, Iss. 1, Oct 1999, pp.64-66
4. [Conover 1999] Conover, W. J. *Practical Nonparametric Statistics*, 3rd. John Wiley & Sons.
5. [Cooper 2001] Cooper, D.R. & Schindler, P. S. *Business Research Methods*, 7 ed. McGraw-Hill.
6. [Daft 1986].Daft, R. L.& Lengel, R. H. Organizational Information Requirements: Media richness and structural design, *Management Science*, Vol. 32, 1986, pp. 554-571.
7. [Durlak 1987] Durlak, J. T. A typology of interactive media, in M. L. McLaughlin (Ed.) *Communication Yearbook 10*, Beverly Hills: Sage, pp. 743-757.
8. [Fenn 1989] Fenn, G.L. and Smeltzer, L.R. Communication attributes used by small business owner/managers for operational decision making, *Journal of Business Communication*, Vol. 26, 1989, pp. 305-321.
9. [Gefen 1997] Gefen, D. and Straub, D. W. Gender differences in the perception and use of e-mail: An extension to the technology acceptance model, *MIS Quarterly*, Vol. 21, Issue 4, Dec 1997, pp. 389 - 400.
10. [Glauser 1984] Glauser, M. Upward information flow in organizations: review and conceptual analysis,” *Human Relations*, Vol. 37, 1984, pp. 613-643.
11. [Hilton 1999] Hilton, Thomas S.E. A model for internet-enhanced education systems derived from history and experiment. *Journal of Computer information systems*.Volume 39, #3. Spring 1999.
12. [Johnson 2000] Johnson, J. D., Chang, H., Pobocok, S., Etherington, C., Reusch, D., & Wooldridge, J. Functional work groups and evaluations of communication channels: Comparisons of six competing theoretical perspectives, *Journal of Computer-Mediated Communication*, Vol. 6, No. 1, 2000.
13. [Karahanna 1999] Karahanna, E. & Straub, D. The psychological origins of perceived usefulness and ease-of-use, *Information Management*, Vol. 35, No. 4, 1999, pp. 237-250.
14. [Marcus 1994] Marcus, M. L. Electronic mail as the medium of managerial choice, *Organizational Science*, Vol. 5, 1994, pp. 502-527.
15. [McEntee 1997] McEntee, E. and Peña-Sánchez, R. El aprendizaje de la cooperación por reciprocidad, *Procedimientos de la 15 Reunión de Intercambio de Experiencias en Estudios Sobre Educación 1997*, Tercer Congreso de Calidad Académica. ITESM. Vol. 1, pp.184–188.
17. [Mitchell 2002] Mitchell, L. Email: Elephant traps and how to avoid them. Research presented at the 2002 training event for archivists and records managers. <http://www.mybestdocs.com/mitchell-l-email-v5.htm>
18. [Pena-Sanchez and Hicks 2006] Pena-Sanchez, R. and Hicks, R.C. Faculty perceptions of communications channels: a survey, *Int. J. Innovation and Learning*, Vol. 3, No. 1, pp.45–62.
19. [Reinsch 1990] Reinsch, N. L. & Beswick, R. W. Voice mail versus conventional channels: A cost minimization analysis of individual’s preferences, *Academy of Management Journal*, Vol. 33, 1990, pp. 601-616.
20. [Rice 1993] Rice, R.E. Media appropriateness: Using social presence theory to compare traditional and new organizational media, *Human Communications Research*, Vol. 19, 1993, pp. 451-484.
21. [Samtani 2003] Samtani, A., Goh, P. G. J., Leow, T. T., Lim, H. M. Overcoming barriers to the successful adoption of mobile commerce in Singapore, *Int. J. Mobile Communications*, Vol. 1, Nos. 1/2, pp. 194-231.
22. [Sikin 1992] Sitkin, S. B., Sutcliffe, K. M. & Barsios-Choplin, J. R. A dual-capacity model of communications media choice in organizations, *Human Communication Research*, Vol. 18, 1992, pp. 563-598.
23. [Steinfeld 1987] Steinfeld, C. W., Jin, B., & Ku, L. L. A preliminary test of a social information processing model of media use in organizations, *Proceedings of the International Communications Association*, Montreal, Canada, 1987.
24. [Trevino 1987] Trevino, L. K., Lengel, R., and Daft, R. L. Media symbolism, media richness, and media choice in organizations: A symbolic interactionist perspective, *Communications Research*, Vol. 14, No. 5, 1987, pp.553-574.