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The Effectiveness of Electronic Work Groups for Student Cases

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Introduction

During the last two years in the case based, upper level undergraduate Management Information Systems Course that I teach, I have included segments in the course to provide opportunities for the students to use the Internet: (1) email for distribution of course assignments and (2) gopher and World Wide Web browsers to find information to supplement case work. As a result of a call from a distribution list, I volunteered my class to participate in collaborative case work using the Internet with universities in Canada, United States, and Mexico: University of Washington, University of Nebraska -Lincoln, University of Oregon, Rowan College, University of Idaho, University of Tennessee at Knoxville, McGill University, Monterrey Institute of Technology and Higher Education, Stephen F. Austin State University, University of Prince Edward Island. Three cases were considered by the faculty at these universities and finally a case about Microsoft Corporation was selected and questions to be answered were agreed upon. At these universities, the students were either taking an organizational strategy course or an MIS course.

In this paper, the process of establishing these collaborative, Internet case groups is discussed. Also the students rated their experience using the Internet case group versus a face-to-face case group they used for a later case assignment about Sun Microsystems.

Establishing the Internet Virtual Groups

Students were randomly assigned to "virtual" groups so that all their group partners were from different universities after each university provided to project coordinator at McGill the names and email addresses of each of their participating students. Most groups included four to five members from Canada, Mexico, and different geographical regions of the United States. Their collaborative work on the Microsoft case questions was to be done entirely over the Internet - no other forms of communication were allowed. Email was used primarily in the beginning by the groups to establish rapport then the sharing of lengthy answers to the assigned questions was best accomplished through a central ftp site provided by McGill. Each group was provided their own ftp site and associated password at McGill where their versions of the question answers were saved. The greatest difficulty with this electronic interchange was first the unusual email addresses at some universities which would mix the use of lower case letterl and the number 1 in the same address and the fact that some students were late getting their email addresses validated. The second major problem was with ftp. Many students mastered ftp uploading

and downloading, but still did not understand that the document has to be saved in the correct format before transmitting over the Internet - they could not just transmit their regular document files from their word processing language. Since most of the virtual groups parceled out the case questions to different group members and many waited until a few days prior to the deadline to upload their solutions to the ftp site, many group members did not realize their lack of understanding of ftp uploading until very late. Of course, there were the usual group problems of group members who vacated their virtual group until the deadline loomed and then wanted to have access to the answers at the ftp site. Some of the email correspondence with these laggards got a bit hostile. Some professors had their students copy them on their virtual group email correspondence but this was soon abandoned as the email load increased. Some but not all universities had Internet Relay Chat.

Establishing the Face-to-Face Groups

For the next case in the class, Sun Microsystems, the students were randomly assigned to teams and given a set of case questions to answer. This case work took much less of my effort than the virtual workgroups since I did not have to train the students in how to use new technologies. There was as usual a few laggards, but in general, there seemed to be much less frustration than with the virtual work groups.

Case Assessment

After completion of each case, Microsoft and Sun Microsystems, the students were given a questionnaire to complete. This questionnaire was developed by Pablo Martin de Holan at McGill and was administered to all the virtual team members. I do not yet have the results from the virtual team members at the other universities, but I do have the results for my 34 students. In addition to completing this questionnaire for each of the two cases, they also took the Myers Briggs Type Indicator of personality preferences. These assessment tools were used to determine what the students perceived as beneficial from these two case experiences and to assess if there were significant differences in the rating of the two case experiences by the students. Using the Myers Briggs personality typing, I wanted to see if personality preferences played a role in the perceived quality of this experience by the students.

The virtual group case was viewed as novel by the students as compared to the traditional face-to-face group case. As expected, the virtual group allowed them to work with people of different background as opposed to our largely homogenous classes. Surprisingly, they perceived they were exposed to different business perspectives more often in the face-to-face groups. The lack of richness of the Internet exchange may explain this result. Table 1 summarizes these findings.

Table 1

Students'	Perceived
-----------	-----------

Benefit	Internet Group Case	Face to Face Group Case
Novel experience	8	2
Learned new concepts	28	26
Worked with people of different backgrounds	23	5
Provided different bus. problem perspectives	9	11

As Table 2 shows the level of frustration was definitely higher for the virtual groups than the face-to-face groups but that was balanced by significantly higher interest level and fun in the virtual groups. The results show that the Internet collaboration was more time consuming than face-to-face which may explain why they did not want more of this kind of Internet assignment.

Table 2

Assignment Rating (Internet Project versus the Face-to-Face Project)	T-test and Std Error	P-value! (2-tailed)
Level of interest	5.27 (.21)	.0001**
Level of fun	3.97 (.18)	.0004***
Usefulness	1.51 (.24)	.1422
Level of frustration	3.65 (.21)	.0010***
Extent would like more of these assignments	0.19 (.32)	.8495
Time consuming	1.78 (.35)	.0839

! Indicates a significantly higher rating for the Internet case as compared to the face to face case

p < = .001 ***

p < = .01 **

Table 3 contains correlations of the Myers Briggs Indicators with the assignment ratings of the virtual and face-to-face case groups. The column headings indicated the Myers Briggs personality dimensions addressed. The scale is from low for the indicator in parenthesis to high on the personality factor outside the parenthesis. So a higher scale value indicates extrovertness while a lower value indicates introvertness. The extroverts were more interested and had more fun with the virtual groups than did the introverts; however, they perceived the virtual groups as less useful. The sensors who like precise

answers to questions also found little use in the virtual groups, but they found the face-to-face groups more fun, maybe since this afforded them the opportunity to get their desired precise answers. There was little relationship between the thinker who is more concerned with equity than making others happy and the feeler who takes others feelings into account and the assignment ratings. Also there was little relationship of the assignment ratings with the judging types who like everything clearly mapped out with few surprises and the perceiving types who are easily distracted and who like to keep their options open.

Table 3 Correlations of Myers Briggs Personality Type with Case Ratings

	Extrovert	(Introvert)	Sensation	(Intuition)	Thinking	(Feeling)	Judging	(Perceiving)
Assignment Rating (Internet Case versus the Face to Face Case)	Virtual Group	Face to Face Group	Virtual Group	Face to Face Group	Virtual Group	Face to Face Group	Virtual Group	Face to Face Group
Level of interest	.37 (.03)*	.25 (.17)	.07 (.71)	.28 (.12)	.07 (.71)	.03 (.91)	-.12 (.50)	-.10 (.58)
Level of fun	.31 (.08)	.16 (.39)	.25 (.17)	.38 (.03)*	-.11 (.54)	.22 (.23)	-.23 (.19)	-.02 (.89)
Usefulness	-.034 (.05)*	-.24 (.17)	-.37 (.03)*	-.13 (.49)	-.33 (.07)	-.09 (.62)	-.13 (.45)	.04 (.82)
Level of frustration	-.21 (.26)	-.16 (.38)	-.14 (.45)	-.25 (.17)	.11 (.53)	.01 (.97)	-.07 (.69)	.01 (.97)
Extent would like more of these assignments	.25 (.17)	.19 (.30)	-.10 (.59)	.10 (.58)	-.09 (.64)	-.25 (.17)	.05 (.79)	-.17 (.36)
Time consuming	.06 (.72)	.22 (.23)	.19 (.29)	-.18 (.30)	.18 (.33)	.14 (.46)	.27 (.14)	-.02 (.91)

p <= .05 *

Conclusion

These results provide interesting information in developing new forms of computer mediated interaction. The lack of face-to-face interchange in the virtual case group seemed to increase the frustration level which was compounded with all the technicalities of exchanging large amounts of textual information using the Internet. The rich interchange in the face-to-face groups reduced their frustration level for the group members but the homogeneity of the groups in many cases resulted in lower case grades since most of these students had been in many of the same classes for the last three years. These students seemed to share common views and approaches for attacking case problems. An alternative explanation for the higher quality results from the virtual group case may be a halo affect attributed to the newness of the technology.

As the face-to-face collaboration in conjunction with text/ data exchange becomes commonly available via the Internet, there will be many opportunities for students to be involved in rich multicultural experiences. These virtual groups were intriguing in that few of the usual stereotypes that accompany face-to-face communication appeared present in these groups.

Table 1

Students' Perceived Internet Group Face to Face

Benefit Case Group Case

Novel experience 8 2

Learned new concepts 28 26

Worked with people of

different backgrounds 23 5

Provided different bus.

problem perspectives 9 11

Table 2

Case Assignment Ratings

Assignment Rating (Internet Project versus the Face-to-Face Project) (2 tailed)	T-test and Std Error	P-value!
Level of interest	5.27 (.21)	.0001 **

Level of fun	3.97 (.18)	.0004 ***
Usefulness	1.51 (.24)	.1422
Level of frustration	3.65 (.21)	.0010 ***
Extent would like more of these assignments	0.19 (.32)	.8495
Time consuming	1.78 (.35)	.0839

! Indicates a significantly higher rating for the Internet case as compared to the face to face case

p <= .001 ***

p <= .01 **

p <= .05 *

Table 3

Correlations of Myers Briggs Personality Type with Case Ratings

Assignment Thinking Rating (Internet Case (Feeling versus the) Face to Face Case) Virtual Virtual	Extrovert Judging (Introvert) (Percei ving)	Sensati on (Intuit ion)	Group Group Group	-Face -Face	Group Group Group	-Face Face	Group Group Group	-
Level of .12 interest (.50)	.37 (.03)*	.25 (.17)	.07 (.71)	.28 (.12)	.07 (.71)	.03 (.91)	-	
Level of fun .23 (.19)	.31 (.08)	.16 (.39)	.25 (.17)	.38 (.03)*	-.11 (.54)	.22 (.23)	-	
Usefulness .13 (.45)	-0.34 (.05)*	-.24 (.17)	-.37 (.03)*	-.13 (.49)	-.33 (.07)	-.09 (.62)	-	

Level of							
.07							-
.01							
frustration							
(.69)	(.26)	(.38)	(.45)	(.17)	(.53)	(.97)	
Extent would							
.05	.25	.19	-.10	.10	-.09	-.25	
-.17							
like more of							
(.79)	(.17)	(.30)	(.59)	(.58)	(.64)	(.17)	
(.36)							
these							
assignments							
Time consuming							
.27	.06	.22	.19	-.18	.18	.14	
-.02							
	(.72)	(.23)	(.29)	(.30)	(.33)	(.46)	
(.14)							
(91)							

p <= .001 ***

p <= .01 **

p <= .05 *