



THE HONORS PROGRAM

Group productivity in varying communication mediums:

Testing face-to-face and virtual interaction

*An Honors Capstone Submitted in Partial Fulfillment of the Requirements for Graduation with
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Abstract

Research in the field of Industrial Organizational psychology identifies key factors that affect team productivity in the workplace. One such critical factor is communication mode and the integration of technology into work interaction. Using an experimental design modeled after Straus and McGrath's 1994 study on productivity when using face-to-face (FTF) and chatroom communication, this study focuses on a Deaf population and adds computer-mediated video communication. Fourteen groups of 3-5 participants were each assigned one of the three modes of communication and given three timed tasks to answer together. At the end, participants filled out an individual survey reflecting upon the group interaction process. The results show that FTF performed better only on the idea-generation task (task 1). Scores from the problem-solving task (task 2) and judgment task (task 3) were not impacted by communication mode. Ratings of feeling heard did not show any significance related to communication type. Ratings of feeling valued, however, was higher among FTF communication group than in text or video groups. Future research in the field should recognize the value of video chat and conduct more extensive studies with larger populations. There also is not much research with a Deaf population; increased research with Deaf participants will help people better understand how to best work with Deaf people and to provide the maximum productive workplace.

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Introduction

Workplace Communications

The emerging field of Industrial-Organizational psychology is in part characterized by emphasis on workplace interaction. With the ever-changing face of technology, new research constantly modifies and updates research studies in this field. Communication technology in particular affects the foci and methods of studies about productivity (Davis, 1991; Jones & Kochtanek, 2004).

Face-to-face (FTF). Face-to-face communication is defined as “any work related, in-person communication between two or more individuals” (Hatch, 1985, p. 46). Face-to-face is commonly deemed as the optimal method of communication for productivity (Westmyer, DiCioccio, & Rubin, 1998; Koku, Nazer, & Wellman, 2001; Hebert & Vorauer, 2003; Riordan & Kreuz, 2010). Productivity is defined as what is produced with the time allotment allowed (Meyer, 1998).

In a study by Allen (1974), a survey was given to the staff of a company: all the employees were listed and the subject was asked to rate from 1-5 how frequently they saw their co-workers, whether they found them useful in their work, and whether they worked with them frequently. The rating of “usefulness” indicates comprehensive communication and effective results from collaboration. Results showed that the usefulness of a fellow employee was correlated with the frequency of FTF contact with one another. This study suggests that as a result of increased FTF interaction, teamwork improved and was more successful.

Courtship. Research studies have indicated the importance of old-fashioned, FTF communication for success in team activities. One aspect of communication, courtship, is key to building team-based trust (Bunker, 1996). Courtship occurs when coworkers become acquainted with one another and build workplace relationships; it permits people to gather sufficient

information about team members to determine whether or not the parties can work together well in varying social and emotional situations. This type of communication encourages constant personal contact with others during which information is exchanged about wants, preferences, and acceptable approaches to difficulties (Bunker, 1996). When working together or solving an interpersonal conflict, employees utilize the approaches established and learned from courtship.

This early work established the importance of interaction, but only in terms of face-to-face interaction. With the introduction of multiple communication technologies, studies shifted to comparing communication methods in their influence on productivity. In fact, increases in the use of technology led to concerns about its effect on the courtship process deemed essential to workplace productivity. Even though the exchange of information through technological means can influence the information flow in an organization, the effectiveness of this mediation still heavily depends on an underlying development of social relationships based on FTF interactions (Eccles & Nohria, 1992). Nonetheless, research has continued to discriminate among different work tasks and communication for each task.

Media richness theory. Richard Daft and Robert Lengel introduced the media richness theory in 1986 primarily to establish a system for describing and evaluating communication media within organizations in richer detail and in connection with a variety of work tasks. This theory provides a framework for researchers to address communication challenges facing organizations, such as unclear content or conflicting interpretations of messages, which occur at any state of a project. Daft and Lengel suggest that types of communication media vary in efficiency when processing information.

Rich information is defined as the capacity of information to change understanding within a certain time interval. Communication methods that can clarify ambiguous issues to

change understanding in a timely manner are considered rich. Daft and Lengel identify face-to-face communication as richer than the telephone or written documents. Although Daft and Lengel do not provide specific examples of face-to-face versus other types of communication with certain tasks, an example might be listening to someone explain over the telephone how to change a tire; one will have a much more difficult time comprehending the task than if one was in person with the instructor who could gesture where to work on the tire. The media richness theory states that with increased ambiguity in a task, as changing a tire illustrates, the need for communication richness also increases.

A multitude of technological advances have been introduced to the workplace since the media richness theory was written in 1986; after the telephone, the largest impact comes from computers, including email, instant messaging, and, today, video chat. Now all of these systems are also available on cell phones. Nevertheless, the principle that face-to-face (FTF) communication is the most effective compared to technology-enhanced communication remains constant for specific task types (Westmyer, DiCioccio, & Rubin, 1998; Koku, Nazer, & Wellman, 2001, Hebert & Vorauer, 2003; Riordan & Kreuz, 2010).

FTF communication differs from the technologies of audio technology (phone) and text-based technology because these studies have shown it transmits the maximum allocation of rich information; the finding is that there are no risks of losing social cues and parties have complete access to one another (Westmyer, DiCioccio, & Rubin, 1998; Koku, Nazer, & Wellman, 2001, Hebert & Vorauer, 2003; Riordan & Kreuz, 2010). However, these studies have not included technology such as video conferencing, which enables participants to see each other's gestures at least within the frame of the camera, potentially providing the opportunity for organizations to have a richer communication media than the traditional conference call on a phone. The

difference is the limitation of the frame; that is, video conferencing typically allows users to see each other from the waist or chest up; most gesticulations and head movement can be seen within this frame.

At least one study adapting the media richness theory to include video conferencing found that it is more productive than email, but that face-to-face is still more productive than video conferencing (Huffman, 2011). Without even minor technological limitations such as the video frame, in-person communication allows for the most access and understanding of others' body language and speech fluctuations, which results in clearer communication effectiveness and ultimately, heightened productivity.

An Evolving Workplace Organization

Today's businesses are increasingly organized around teams focused on projects (Robertson & Huang, 2006; Tapscott & Williams, 2008). As productivity can be encouraged by a strategically designed workplace promoting the work community, teams assemble and dissolve according to project needs. Indeed, the importance of communication methods has become even more important in today's team-organized workplace. Because of this organization, businesses have reconstructed as community centered offices to enhance collaboration opportunities and communication (Stryker, 2004). Technological advances have also become a point of focus in improving the workplace for enhanced communication and productivity alongside FTF interaction.

Communal workplace. Although most employees have desks, they spend 50-70% of their time elsewhere in common areas (Stryker, 2004). For example, a hallway where much of the worker traffic occurs is a popular meeting spot to interact in. This phenomenon reflects the rise of communal workplaces and the interaction that results from this workplace design. Stryker

found that open offices, high-density occupancies, and close proximity of team members all increase the efficiency with which crucial FTF interaction is conducted and thereby reduces the overall time of task completion. This study also found significantly more team communication in situations with a high quantity of extra-office space and contact places such as lounges and coffee stations.

Communal workplaces and high interaction allow for better task performance. Team productivity has its challenge, however, in that tasks with high levels of interdependence possess greater potential for difficulties in reaching consensus (McGrath, 1994). Certain tasks require FTF interaction to produce the best results while others do not. For example, a study by Diehl (1991) showed that for tasks such as idea generation, which involves brainstorming creative solutions, work is fast in computer-mediated text groups because they can enter information simultaneously. For other tasks that require discussion, such as problem solving and conflict resolution, work is slower since it takes longer to type than it does to speak.

Productivity changes according to specific tasks and means of communication. When communication is clearer as a result of rich media usage, groups will be more productive in their work, meaning what is produced with the time allotment allowed (Meyer, 1998). To understand how different tasks should be approached in order to meet productivity standards, current uses of technology for the workplace have received some attention in research (Straus and McGrath, 1994).

Technology. The rise of technology worldwide has permeated workplace communications because they offer speed, convenience and accessibility to information. Despite the continuing value of face-to-face communication, these ideal qualities of computer-mediated communication can be beneficial when used strategically although examples of misuse appear.

For example, technology surely allows workers to multitask, but overuse of computers can complicate worker interpersonal relations. Some features of electronic communication may actually impair work efficiency, particularly in a team-organized workplace. In fact, studies show that groups who interact in computer-mediated chatrooms almost always take longer to complete tasks than do FTF groups (Kiesler, 1987; Weisband, 1992). Hence, it is important that computers are used appropriately for tasks and in moderation, while maintaining FTF interaction in the workplace. To understand how to use technology appropriately, researchers have described its limitations.

Impact of technology on social context cues. One such limitation of technology concerns the amount of social context cues. Social context cues in communication help people regulate interaction, express information, and monitor feedback from others (Argyle, 1968). A reduction in cues such as eye contact, head nods, and voice fluctuation creates disruptions in the flow of communication (Rutter, 1975). The inability to perceive cues such as facial expressions reduces information about whether others understand or agree. For this reason, some evidence exists that individuals feel others understand their ideas less when communicating through media that reduces or eliminates social cues (Kristen, 1973).

Since Kristen's early study, other researchers have looked at a greater array of technology. In these studies, it becomes apparent that not all technology has the same inhibiting effect. It is important to note that some modes of technology, such as video chat, are closer to the richness of FTF than others, like text-based chatrooms. In Hiltz's study (1986), computer mediated video communication and FTF groups produced results of equal quality in a problem solving task, but computer mediated groups struggled and were less likely to reach consensus than FTF groups. Computer mediated and FTF groups were found equally effective in generating

correct solutions in an induction task, which involves identifying an explanatory principle, but computer groups had more difficulty deciding among proposed solutions (Daly, 1993).

In addition to Huffman's and Hiltz's study comparing FTF with video conferencing, another fairly recent study (Hiltz, Johnson, and Turoff, 2006) differed: While Huffman's study revealed that FTF led to greater productivity, the latter showed that group decisions were equally satisfactory between FTF and video conference, but the groups were less likely to reach agreement and there was less communication flow in the video chat mode.

This result points to the idea that although video conferencing allows access to most social context cues of communication, nothing can fully replace the synergy of being in the same room with a workgroup. Although video communication is a live feed of voice and body language, which allows for smooth interaction of ideas, the users of video conference are still remote physically and the visual field is limited. It is, potentially, a profound enough difference to impact group productivity.

An Update to Existing Studies

This study seeks to test productivity in different kinds of tasks using different communication modes among participants who are all deaf. Three aspects of this experiment, then, are tasks, communication modes, and subjects.

Varying tasks require different types of interaction and information transaction—which is why three types of tasks will be utilized in this study to better understand overall productivity in relation to communication. This study is modeled in methodology after Straus and McGrath's (1994) study on productivity in three kinds of tasks using FTF interaction and chatroom conferencing as an example of computer-mediated interaction. These three tasks included: an idea generation task, in which an unlimited amount of solutions or improvements are listed; an intellectual task, in which knowledge in varying subjects and problem solving is tested and a

correct answer exists; and a judgment task, which requires critical thinking and employment of a moral system.

As for communication, the Straus and McGrath study included FTF and text-based chatroom conferencing. The current study includes these two modes, but it also includes video chat computer-mediated communication tested in the Hiltz (1986), Hiltz, Johnson, and Turoff (2006) and the Huffman (2011) studies. Video chat and video conferencing are used synonymously in this study. To summarize, Straus and McGrath used three interdependent tasks to test productivity in two different communication systems. This study adopts their clear testing methods for overall productivity but updates the study with a third communication system: video technology. Advancing video communication may be an improved substitute for FTF interaction compared to text-based computer-mediated communication. In line with continually updated research in this area, this study assesses the benefits and drawbacks of newer modes of communication in comparison to older modes.

To help understand productivity results of group work, this experiment surveys participants individually at the end in order to study their thoughts and feelings regarding the interaction within the group. This procedure mimics Straus and McGrath's study, which surveyed individuals after each task for their reaction. A feature of the participant group in this study is that they attend a Deaf university, which means individuals of varying hearing and communication levels are working together. Because of their particular communication experiences and skills, these Deaf participants provide additional information regarding text versus visual technology.

Bilingual Factor of Deaf Participants

The participants in this study are predominantly Deaf and use American Sign Language (ASL) to communicate, so visual access is valued immensely. ASL is founded on the visual-

gestural modality, unlike spoken language. As a result, ASL has a different linguistic structure from languages like English, for example (Boudreault, 2006). In addition to ASL, Deaf people use English sometimes only in written form and sometimes as a spoken form, too. For this reason, Deaf ASL users most often are bilingual to different degrees.

These bilinguals vary considerably in the age at which they acquired the languages, their linguistic knowledge, and their fluency in each language. Bilinguals develop their languages to meet the level of fluency required by their environment (Parasnis, 1998). As there is no official written language for ASL, when participants are communicating through text in English, some may be using their second language. Others may have more difficulty expressing themselves using ASL in the FTF interaction or video chat groups. Boudreault (2006) noted that the Deaf community often views deaf individuals who do not use ASL as outsiders. ASL is the most essential linking factor for Deaf people who were brought up in the Deaf community. In order to feel completely at ease, Deaf people need free flowing language accessibility (Boudreault, 2006). In a group study such as this one, the language skill level of group members in either ASL or English may impact their comfort and interaction with one another in one or another of these communication technologies as well as in FTF communication.

Although not a factor for Straus and McGrath in their experiment, which serves as the model for this study, these communication differences with regard to dependence on visual social cues must be taken into consideration in the results of this study. In any case, these languages and their differing modalities are factors to be considered in the results of this study. This study and its outcomes may be somewhat applicable to larger hearing populations, particularly younger generations used to video technology as well as texting, but may also differ slightly with hearing participants.

Hypothesis

This experiment tested the value of FTF interaction compared to computer-mediated communication, both visual and text-based, in relation to workplace productivity. It was expected that both of these forms of mediation would be less productive than FTF interaction, but video chat would be an effective alternative as it mirrors the qualities of FTF communication.

Justification of Study

Upon the conclusion of this study, it is hoped a valuable piece of information will be added to the existing research in the IO field. As businesses grow more reliant on technology to assist communication in the workplace, they must study what is the most effective use of current resources. Video chat is the closest medium to FTF interaction- it allows visual and sound cues to be traded between the participants, resulting in clearer communication and ultimately, increased productivity compared to other available technology.

Method

Borrowing and adapting Straus and McGrath's (1994) research on task type and technology related to performance as well as member reactions, this experiment involved 14 teams of three to five assigned to work together either in person (four teams), through instant messenger (five teams), or through video chat (five teams) on tasks that reflect productivity in the workplace. The groups were given three tasks: an idea generation task, an intellective task, and a judgment task. Before proceeding with the tasks, consent forms were collected from all participants. The quantitative data collected from these groups compared measures of productivity and explained correlations and observations that the team members reported in the survey.

Participants

The participants were mainly Deaf and hard of hearing undergraduate students at

Gallaudet University. Groups had a mix of age, gender, and hearing status in the teams. There were 20 men and 35 women; all but one had a hearing loss. They were recruited through fliers posted in the main academic buildings on campus and through teachers who allowed extra credit points in exchange for participation.

For compensation, students had to check with their teachers if they could use the participation opportunity for extra credit. Some professors offered the opportunity in class, whereas other teachers did not have an agreement established with this study or were not aware of the opportunity. Participants were reminded that they were not guaranteed extra credit as final discretion for all extra credit policies rested with their instructors, and were encouraged to check with their instructors' specific policies. If a student decided to withdraw from the study at any time, they still received the credit. There were no penalties for discontinuing participation. To avoid extra costs, equipment was borrowed.

Environment

The same testing room was used for all three situations. The “collaboration room” in a computer lab had bare walls and was furnished with one large round table eight feet in diameter. Face-to-face communication took place around this table. But in computer mediated communication, dividers formed makeshift cubicles to prevent eye contact. In addition, each person in the computer-mediated groups used a laptop.

Running the Experiment

When the participants entered the room, they sat at the table to fill out and sign an agreement to participation in the experiment (Appendix A). After the forms were finished, the test conductor briefly reviewed the experiment procedure, opened the computer program Oovoo for the computer-mediated groups, and started video or text chat. Each participant received the Task 1 sheet. Participant A also received a blank answer sheet to record the group's answers on.

The teams had thirteen minutes to complete the first task, idea generation, to the best of their ability. This process was repeated for the second task, intellective, which was taken from a sample GRE test, and the third task, judgment (see Appendix B for task sheets). In all three communication situations, the test conductor sat discreetly at a desk in the same room to ensure there was no prohibited interaction and notified participants when the time was up for each task.

Survey

Upon completion of the three tasks, the test conductor distributed a survey (Appendix C) to the participants. This survey provided a supplemental tool in understanding the productivity results of the group tasks in terms of communication preferences/skills, task difficulty, and feelings regarding group dynamics were evaluated. Participants indicated on a scale from 1-5 how much they felt their group members valued their contributions, and whether or not they felt their input was heard.

Project Evaluation

The results of the experiment and survey were analyzed through SPSS for correlations and productivity measures. Group answers were examined for outcomes of which groups were the most productive. For the idea generation task the test conductor counted how many enforceable ideas were recorded. For the critical thinking multiple-choice test answers were marked as right or wrong. In the judgment task all the parts should have been answered thoroughly and sensibly; a neutral third party experienced in this area was assigned to evaluate whether answers could have been effective or not in reality. This individual has a terminal degree in psychology and was blind to participants' condition when scoring the task. Utilizing both productivity tasks and a survey was appropriate for this experiment because this study was run to see precisely how productive teams were in different communication situations, but also to examine how the communication changes affected the participants' thoughts and feelings.

Results

Descriptive statistics are shown in Table 1. The mean productivity scores for the tasks are as follows: Task 1 was 19.57, Task 2 was .64, and Task 3 was 5.64. The average individual rating of feeling heard was 4.39 out of 5 whereas the average individual rating for feeling valued was 4.30. Groups had an average of 3.86 members.

Table 1. Means and standard deviations for number of participants per group, productivity score per task, and individual ratings of feeling heard and valued, separated by communication type.

	FTF		Video		Text	
	Mean	SD	Mean	SD	Mean	SD
# Participants/Group	4.00	.82	4.00	.00	3.60	.55
Prod. Task 1	26.75	4.57	17.60	4.93	15.80	6.90
Prod. Task 2	.50	.58	1.20	1.01	.20	.45
Prod. Task 3	5.50	2.08	5.60	3.13	5.80	3.49
Feeling Heard	4.72	.28	4.25	.50	4.27	.41
Feeling Valued	4.81	.14	4.20	.45	4.00	.54

Note: Prod. = productivity

The first goal of the project was to understand how the three communication conditions- FTF, video, and text- compared on productivity scores. Three one-way, between subjects ANOVAs were conducted to compare the effect of communication mode on scores in the three productivity tasks. There was a significance effect of group communication mode on level of productivity in Task 1, $F(2, 11) = 4.65, p = .034$. To fully understand the nature of this effect, post-hoc tests were conducted using Tukey HSD. Results indicate that groups using FTF communication were significantly more productive than groups communicating via type. Productivity scores for the video chat group were between those for the FTF and type groups, and were not significantly different from either group, although there was a marginally significant difference between FTF and video ($p = .08$). There was not a significant effect of group communication mode on level of productivity in Task 2 or 3.

The second goal of this study was to see if there was a difference in individual ratings of feeling heard and valued in different communication modes. First, individuals' scores were averaged to create two mean scores for each group, one reflecting the extent to which participants felt heard by other members of their group and the second reflecting the extent to which participants felt valued by other members of their groups. Two one-way, between subjects ANOVAs were conducted to compare the effect of communication mode on individual ratings of feeling heard and valued. There was a significance effect of group communication type on feeling valued, $F(1.52, 2.04) = 4.09, p = .047$. Post hoc comparisons using the Tukey HSD test indicated that the mean score of feeling valued in the FTF condition was significantly higher compared to the type condition. There was no significant effect for individual rating of feeling heard.

The third goal of this study was to see if perceived individual value was connected to group productivity. A partial correlation test controlling for group size was conducted to test correlations between feeling valued and the three group productivity scores. Results are shown in Table 2. The two variables feeling valued and productivity scores for Task 1 were significantly correlated, $r(11) = .026, p < .01$. Groups in which participants felt more valued by other group members were more productive on Task 1. There were no other significant correlations.

Table 2. *Partial correlations for individual rating of feeling valued and task productivity scores, controlling for number of participants per group.*

	# Participants/Group			
	<i>Feeling Valued</i>	<i>Prod. Task 1</i>	<i>Prod Task 2</i>	<i>Prod Task 3</i>
Feeling Valued	0	.026*	.576	.755
Prod. Task 1	.026*	0	.395	.844
Prod. Task 2	.576	.395	0	.593
Prod. Task 3	.755	.844	.593	0

Note. * $p < .05$. Task 1 = idea generation task. Task 2 = intellectual task. Task 3 = judgment task.

Discussion

This paper examines the modes of communication related to group productivity, analyzes individual ratings of feeling heard and valued in different communication modes, and studies if perceived individual value was connected to group productivity. Previous research by Straus and McGrath (1994), within the hearing population, showed a significant interaction of medium and task type on overall task effectiveness. On the judgment task (Task 3 in this study), Straus and McGrath found substantial performance differences between text and FTF groups, favoring FTF. Text groups were less productive than FTF groups on all tasks, but text communication was less suitable for some tasks than other communication types. Text groups also reported having more difficulty understanding one another than FTF groups. Straus and McGrath (1994) evaluated group performance based on quality of the answers; because of this, FTF was the best communication mode in the given time limit. Their study concluded that had text groups been given more time, the productivity scores would have matched those of FTF groups.

Results from this study in comparison to Straus and McGrath's 1994 study support the findings that specific communication modes may suit certain task types for both hearing and Deaf populations. FTF performed better only on the idea-generation task (Task 1). This task measured quantity over quality, only counting how many ideas were generated. Groups using text communication might have had slower communication flow as they had to type out their ideas to one another. For Deaf participants, it is possible typed communication slowed down the progress of the group their primary language may not be English. Scores from the problem-solving task (Task 2) and judgment task (Task 3) were not impacted by communication mode; these tasks focused on quality over quantity, and groups generally had no problem completing the task within the time limit regardless of communication mode. This suggests space for future

exploration; perhaps with a larger sample size it would be clearer in what way the Deafness of the participants influences the results. Overall, these patterns emphasize that certain task types do not require such rich communication as FTF, but can be successful through technological communication means instead.

Ratings of feeling heard did not show any significance related to communication type. Participants felt that they had input in the discussion in all group types. Ratings of feeling valued, however, was higher among FTF communication group than in text or video groups. FTF groups had more interaction opportunity through body language and were more exposed to one another. Similarly, in Kristen's 1973 study, participants felt they were less understood when communicating through media that reduces or eliminates social cues, which are most prevalent in FTF communication (Kristen, 1973).

Limitations

The goal of this study was to add video chat to compare to Straus and McGrath's study but results were not conclusive. Limitations of this study were small participant size and task question content. In the future, a larger sample should be used in order to make the impact of each variable clearer. With a larger sample size, it may be easier to study the impact of language and Deafness on productivity scores. As is, the results only show a minor difference between each communication type. Studying a larger population would help clarify the differences. Also, improving the task questions 2 and 3 should be considered, as many groups did not score well. It is possible that these questions were not appropriate measures of group productivity in an undergraduate population. Many groups struggled to answer task 2, the math question. This question is a sample from a GRE test, but as many participants were not yet seniors, the knowledge level may have been too high. Task 3 was also tough for groups to answer, as only a

few participants have had real work experience or study business.

This study and its findings are an important addition to the current studies in the field. As technology is constantly being replaced and updated, the benefits and effectiveness need to be evaluated. Video chat has become a major mode of communication in the workplace, often replacing FTF interaction. This study showed that video chat was similar to FTF communication in group productivity results. Future research in the field should recognize the value of video chat and conduct more extensive studies on it. There also is not much research with a Deaf population; increased research with Deaf participants will help people better understand how to best work with Deaf people and to provide the maximum productive workplace.

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Appendices

Appendix A

Informed Consent Form

Project Title: Productivity in FTF and Virtual Interaction

Principal Investigator: Jessica Walker

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Phone: 949-351-6564

E-mail: Jessica.Walker@Gallaudet.edu

Faculty Sponsor: Deborah Schooler

Department: Honors Program

I am an undergraduate student at Gallaudet University. I am conducting research on how different modes of group communication impact productivity. I would like you to consider participating in this study. It is hoped that this study can be used to understand technological advances with communication in the workplace.

This Study

1. You and your group members will be given three tasks to complete together. You will be assigned to communicate in person (face-to-face), through instant messaging, or through video conference. One team member will be assigned as answer recorder and will write the group answers on the answer sheet. For each of the three tasks, your group will have 13 minutes to complete it. After all tasks are complete, you will fill out a survey regarding your individual experience in this study.
2. It is anticipated that your participation will take approximately an hour.
3. You will be rewarded extra credit for your participation upon discussion and agreement with participating professors.

Language

Instructions will be given in ASL and the tasks will be written in English. I will accommodate your preference for language and communication style. Please let me know about any particular communication requirements that you require.

Risks

There is no more than minimal risk to individuals who participate in this research study.

Benefits

Your participation in this study will create a valuable contribution to the literature by extending the work of previous researchers.

Confidentiality

All of the answers to the tasks and survey will remain anonymous and confidential as only the research team will have access to information regarding this study.

Voluntary Participation

Your participation in this study is voluntary. If you decide not to participate in the study, your relationship with Gallaudet University will not change in any way. You may withdraw from the study at any time before or during data collection, for any reason and without penalty.

Results

Results and analysis of this study will be presented at the conclusion of this study. Participants may attend the honors capstone presentations to learn about the information gathered from this experiment.

Contacting the Researcher or the IRB

Contact the researcher, Jessica Walker, if you have questions about any risk to you because of participation in this study. Use the phone number or e-mail account at the top of this consent form. You may also contact the Chairperson of the Gallaudet University Institutional Review Board for the Protection of Human Subjects (IRB) at irb@gallaudet.edu.

Intent to Participate

If you agree to participate after reading this far, then read the following, print and sign your name below, and enter the date.

I have read the Informed Consent Form and agree to participate in the study conducted by Jessica Walker. I understand that I can withdraw from this study at any time without penalty or prejudice. I understand that I will receive extra credit for my participation from consenting professors.

Your Name _____

Signed, _____ Date _____

Appendix B**Task 1**

As a group, list as many ways you can think of to enhance the success of a 5k race fundraiser.

The ideas must be feasible.

Task 2

Directions: Answer the following questions as a group. Questions 1 to 3 are based on the following data.

PERCENT CHANGE IN MONTHLY* VALUE OF INVENTORY
AT SIX BUSINESSES FROM APRIL TO JUNE

The table has 3 columns, and 6 rows.

Business	Percent Change from April to May	Percent Change from May to June
<i>G</i>	6	8
<i>K</i>	5	-5
<i>M</i>	2	12
<i>R</i>	8	-5
<i>V</i>	14	0
<i>Z</i>	2	-10

*Inventory values are determined at the end of each month.

1. If the value of the inventory at Business *K* was \$30,000 for April, what was the value of the inventory at Business *K* for June?

- A. \$22,500
- B. \$29,925
- C. \$30,000
- D. \$33,000
- E. \$33,075

2. At Business *M*, the value of the inventory for May was what percent of the value of the inventory for June?

Give your answer to the nearest 0.1 percent.

 %

3. For which of the six businesses shown was the percent change in the value of the inventory from April to June greatest?

- A. *G*
- B. *K*
- C. *M*
- D. *R*
- E. *V*

Task 3:

For the situation below, your group must agree on one action for each question. Keeping the business' overall well-being in mind, explain your group's answers.

An employee and his supervisor become romantically involved. The employee takes advantage of this relationship and does not complete all of his work, leaving more to his co-workers to complete. As the company CEO, you must resolve issues related to this situation:

1. What happens to the boss for allowing this to happen?
2. What happens to the employee for taking advantage of his position?
3. How are the angry and overworked co-workers approached?

Appendix C**Survey:**

Please circle your answers to the following questions:

1. I am: Deaf hard of hearing hearing
2. I am: Male Female Other
3. I am: 18-21 22-25 26+
4. How would you rate your group's communication?
(poor) 1 2 3 4 5 (excellent)
5. How would you rate your group's productivity?
(poor) 1 2 3 4 5 (excellent)
6. How would you rate your group's teamwork?
(poor) 1 2 3 4 5 (excellent)
7. Did you feel like your input was heard by the group?
(very little) 1 2 3 4 5 (a lot)
8. Did you feel like your input was valued by the group?
(very little) 1 2 3 4 5 (a lot)
9. What is your preferred medium of communication when working in a group via face-to-face?
ASL Spoken English Written English Other
10. What is your preferred medium of communication when working in a group via video chat?
ASL Spoken English Written English Other

22. How well do you write in English?

(poorly) 1 2 3 4 5 (excellently)

23. How well do you know English idioms or English expressions?

(poorly) 1 2 3 4 5 (excellently)

24. How would you rate task #1?

(easy) 1 2 3 4 5 (difficult)

25. How would you rate task #2?

(easy) 1 2 3 4 5 (difficult)

26. How would you rate task #3?

(easy) 1 2 3 4 5 (difficult)

27. Of the three tasks given to your group, which task was the hardest to answer?

28. How would you rate your overall experience completing these three tasks with your group?

(poor) 1 2 3 4 5 (excellent)

29. Comments/thoughts: