# A STUDY OF ESSENTIAL COMMUNICATION SKILLS AND COMMUNICATION ACTIVITY AT VARIOUS JOB LEVELS IN AN ARCHITECT / ENGINEER FIRM

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ABSTRACT

# A STUDY OF THE ESSENTIAL COMMUNICATION SKILLS AND THE COMMUNICATION ACTIVITY OF TECHNICAL/ENGINEER EMPLOYEES IN AN ARCHITECT/ENGINEER FIRM

by

Henry Samuel McKeown

The purposes of this study were to: (1) identify the written and verbal communication skills needed by technical/engineer employees at various levels of employment in an architect/engineer firm, and (2) define the relationship between job level and the frequency and kind of communications sent and received in a profit oriented, hierarchically structured organization.

The population for the study was 1060 employees in eight job levels in an architect/engineer firm in Jackson, Michigan. The Employment Specialist of the firm stratified the population according to the most recent performance appraisal. The sample was selected from the "successful/promotable" category. The sample was 41 successful employees including five employees for job levels one to seven and six employees for level eight. The job levels from highest to lowest were executive, project manager, lead engineer, engineer, junior engineer, senior designer, senior draftsperson, and draftsperson/trainee.

The study was completed in two parts. In the first part, the 41 employees kept daily logs of their job related communication activity for five working days. The logs were returned to the researcher each day. The purpose of the log recording was to obtain information about the frequency of communication activity and the time used to plan and deliver various written and verbal communications. In the second part, the employees completed a three-part questionnaire. The questionnaire was administered after all employees had recorded their daily communication activity. The questionnaire was designed to obtain information about the self-perceived importance of various communication activity for each job level.

To test the linear relationship between job level and a variable, the Pearson product-moment correlation coefficient was computed. The one-factor Analysis of Variance was used to test for signiificant between level differences when: (1) the hypothesis was concerned with a non-linear relationship, or (2) when r was not significant at the .05 alpha level. The t-test was used to see if a mean was significantly greater than zero for one hypothesis. The alpha level for all tests of significance was .05.

## FINDINGS

Significant linear relationships were found between job level and several variables. Higher levels had a higher frequency of communications sent and received, used more different channels, communicated more frequently with people outside the firm, and used more total time and time per message than lower levels. Higher levels rated the following variables higher than did the lower job

levels: overall importance of communication skills; importance of their ability to plan and deliver persuasive, task, and human messages; importance of short memoranda, long memoranda, short reports, long reports, person-to-person, small groups, large groups, speech/presentations, and telephone. The findings indicated that there were wide within group variances for some of the variables but that the general linear relationship was high level and high frequency or rating for the above variables.

The findings indicated that verbal communication methods were used for seventy-nine percent of the total messages sent and received for all job levels. Person-to-person, telephone communication, and short memoranda accounted for eighty-six percent of all of the messages for all job levels. The higher job levels used more written communication methods, large groups, and speech/presentations than did the lower levels. In general, the findings indicated that higher levels used a wider variety of communication methods to send more complex messages than lower levels used.

## CONCLUSIONS

The findings provide information that should be used for making decisions about communication curricula for higher education technical/engineering students. The two-year technical graduate would be hired at job level eight, draftsperson/trainee, in this firm. The required communication courses for technical students who graduate with a two-year degree and seek employment in a firm similar to the one surveyed should include the following: (1) listening; (2) reading and comprehension; (3) verbal information

giving and receiving using person-to-person, small group, and telephone communication methods; (4) written communication--short memoranda that give information; (5) introduction to reports and letters; (6) employment skills-letter of application, resume', and personal interviewing; (7) role and importance of communication in organizations. The four to five year career development program for the two-year technical graduate should be designed so that the person will be ready to assume a great deal of responsibility for communicating with both higher and lower levels. He should develop expertise in writing short memoranda, long memoranda, short reports, and letters that include elements of information giving and persuasion. He should develop expertise in verbal communication skills as those skills relate to information giving, task, maintenance, and human messages. He should also develop the ability to communicate effectively with people outside the firm. These long-range needs should be met within four to five years through company sponsored seminars or additional classes in higher education institutions.

The four-year engineering graduate would be hired at level five, junior engineer, in this company. The beginning engineer should be able to write short memoranda and letters that give information, and communicate verbally in person-to-person and small group situations within the firm. Within three to five years, the engineer may be promoted to a level at which he must be able to use a wide variety of communication methods to give information and persuade others.

The findings indicate that the most essential learning experiences that would benefit the engineers who are seeking initial employment in a firm similar to the one surveyed are those experiences that develop the engineer's ability to communicate with person-to-person, small group, telephone, and short memoranda methods. Within three to five years, these basic methods should be complemented with higher level report writing, speaking, large group methods, and letter writing to give information and persuade. Since it will take at least three years before the engineer actually begins using these high level communication skills, perhaps the courses dealing with them could be postponed until the last year of a four year curriculum or only introduced during the four years of college. In either case, the engineer should become involved in seminars relating to those skills during his first few years of employment so that when promotion time arrives he will be ready with recent experiences in the needed communication skills.

# A STUDY OF ESSENTIAL COMMUNICATION SKILLS AND COMMUNICATION ACTIVITY AT VARIOUS JOB LEVELS IN AN ARCHITECT/ENGINEER FIRM

By

Henry Samuel McKeown

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# CHAPTER I

# THE PROBLEM

## Introduction

A portion of the curricula in higher education must be planned so that the skills and knowledge which students are exposed to are the skills and knowledge which they will need as employees in their chosen careers. All career choices require technical skills and knowledge that are often unique to that career, and all career choices require related skills and knowledge that are common to a wide range of careers and which complement the needed technical background.

Written and verbal communication knowledge and skill needs may be common for many careers, and higher education curricula should reflect adequate emphasis in those areas. Most careers will require that employees be able to communicate with others within and outside the organization which employs them. To plan related curricula that will complement a graduate's technical skill and knowledge for various careers, educators need accurate information about the written and verbal communication skills which students will need for initial employment and future promotions.

Most educators seemed to have assumed that all students need the same communication curricula. Rather than simply to make such an assumption, research regarding the role of communication on the job should be done in many career areas in order to provide specific information that can be used for making curricular decisions. When each career area is accurately described, higher education personnel can plan curricula that reflect the actual on-the-job needs. Field research in organizations which employ higher education graduates is an important link between on-the-job needs and higher education curricula.

## Statement of the Problem

There is a lack of specific information about the written and verbal communication skills needed by employees in the technical/engineer career area. Although the concept that these employees need to communicate has been generally accepted, the specific communication skills needed by technical/engineer employees have not been described.

Employers and educators realize that written and verbal communication skill development should be an integral part of the technical/engineer curricula. In the 1972 Final Report: Engineering Technology Education by the American Society for Engineering Education, the authors discuss the need for attention to communication skills in all

engineering technology curricula.[1]

In addition to the need for field research for curricular decisions, students of organizational communication are continually trying to identify relationships between job levels in various organizations and communication activity. Pettit states that additional research is needed to determine "the extent that the communication activities of one organization overlap to another and to determine the actual relationship between levels of an organization and the amount of information received at those levels."[2] As research about different organizations is completed and the findings synthesized, the study of organizational communication will move closer to the development of theory.

It is expected that a study of the written and verbal communication skills needed by technical/engineer employees in an architect/engineer firm will be of benefit to educators and others interested in the study of organizational communication.

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[1] Final Report: Engineering Technology Education Study, American Society for Engineering Education, January 1972, pp. 343, 344, 350, 355, 367.

[2] John Pettit, "Guidelines and Suggestions for Research in Business Communication." Journal of Business Communication, Summer 1971, Vol. 8, Number 4, p. 22.

## Purposes

The study has two purposes: (1) to identify the written and verbal communication skills needed by successful technical/engineer employees at various levels of employment in an architect/engineer firm; (2) to further define the relationship between job level and the frequency and kind of communications sent and received in a profit-oriented, hierarchically structured organization.

## Research Questions

Before educators plan certain programs and curricula, it is essential that field research be conducted to describe the skills and knowledge which graduates will need on the job. The research questions relating to field research and higher education curricula which represent the primary focus of this study are as follows:

1. What are the written and verbal communication skills needed by technical/engineer employees in various levels of employment?

2. How frequently do employees use various kinds of written and verbal communication skills at various levels of employment?

3. Which written and verbal communication skills are most important for employees at various levels of employment?

4. What are the self-perceived strengths and weaknesses of employee's written and verbal communication skills?

## HYPOTHESES

The written and verbal communication skill needs and the relationship between job level and communication activity of technical/engineer employees will be tested using a communication log and questionnaire. The following are the hypotheses that will be tested:

Hypothesis 1: The employees' self-perceived importance ratings of over-all communication skills in their present position will increase as job levels go up.

Hypothesis 2: Employees who indicate that increased communication could improve job efficiency will select an increase in communication with higher levels as the method for increasing job efficiency more frequently than they will select an increase in communication with lower levels.

Hypothesis 3: The number of communications sent and received will increase as job levels go up.

Hypothesis 4: The number of different communication channels regularly used will increase as job levels go up.

Hypothesis 5: The frequency of external communications sent and received will increase as job levels go up.

Hypothesis 6: The mean time used to communicate will increase as job levels go up.

Hypothesis 7: The length of time used per message will increase as job levels go up.

Hypothesis 8: The combined frequency of using person-to-person, small group, and telephone communication methods will not vary by job level.

Hypothesis 9: The number of different communication methods used will increase as job levels go up.

Hypothesis 10: The self-perceived importance ratings of short memorandum, long memorandum, short reports, long reports, letters, person-to-person, small groups, large groups, and telephone will increase as job levels go up.

Hypothesis 11: The self-perceived importance rating of drawing notes and writing/graphics will increase as job levels go down.

Hypothesis 12: The self-perceived importance of employees' ability to plan and deliver information giving and maintenance messages will not vary by job level.

Hypothesis 13: The self-perceived importance of employees' ability to plan and deliver persuasive, task, and human messages will increase as job levels go up.

Hypothesis 14: The self-perceived need for help ratings for four different phases of written communication will increase as job levels go up.

Hypothesis 15: The self-perceived need for help ratings for four different phases of verbal communication will increase as job levels go up.

## Importance of the Study

This study is important because it will provide useful information which could be used when higher education personnel make curricula decisions for technical/engineer programs. Both beginning and experienced technical/engineer employees need to continually develop effective communication skills. Dixon and Nelson emphasized that "new practice oriented premises are needed for engineering education."[3] One of their premises emphasizes the idea that a major portion of the core of engineering curricula should be designed to develop an engineer's professional behaviors. One of the behaviors they emphasize is communication.[4]

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[3]John R. Dixon and Carl W. Nelson, "Practice-Directed Engineering Education," Engineering Education, October 1973, pp. 39 & 40.

[4]Ibid., p. 40.

Specifically, this study is important because it should provide information about the communication skills needed by employees of an architect/engineer firm. As curricula are planned for engineering students, the information gained from this study should help define the appropriate communication skills which need to be emphasized in the core curricula for full-time technical/engineer students.

Along with curricular implications for full-time students, this study should provide important information that can be used to make continuing education curricular decisions for the continued professional development of technical/engineer employees. The importance of continued development of communication skills by technical/engineer employees is emphasized by Marvin. He describes ten check-points which he considers as basic components of successful performance, one of which is communication skills. He goes on to stress the idea that "an engineer's most important product is information which must be effectively communicated."[5]

If educators can identify the communication skills needed at different levels of employment, seminars and courses can be designed to meet the specific needs of returning students. Little research has been completed that emphasizes communication activities of lower level employees in organizations. Research in this area is important because most higher education graduates will begin careers

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[5]Philip Marvin, "The Professional Development of Professional Engineers," Engineering Education, February 1972, p. 451.

in positions below the executive level. Pettit further emphasizes the importance of research in this area when he writes about the communication activity of individuals at high and low levels of employment.[6] This study is important because it is concerned with various levels of employment and ought to provide information about the communication skill needs of technical/engineer employees.

Furthermore, this study is important because it should add to knowledge about organizational communication. Specifically, the study may further define the relationship between levels of employment and the frequency, kind, and importance of written and verbal communications sent and received. Pettit emphasizes that "additional research should be conducted to determine the actual relationship between levels of an organization and the amount of information received at those levels."[7] Goldhaber also supports its importance when he lists as part of his recommendations for future research the question: "What is the relationship between levels of an organization and the amount of information received at those levels?"[8]

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[6]John D. Pettit, et al., "Guidelines for Research in Business Communications," Journal of Business Communication, Spring 1972, p. 50.

[7]Ibid., p. 47

[8]Gerald M. Goldhaber, Organizational Communication, Dubuque, Iowa: Wm. C. Brown Company Publishers, 1974, p. 286.

In conclusion, Simonds summarizes the importance of this research. "The principle value of this kind of study is to distinguish the purpose for which certain teaching is desirable. Courses in English composition or letter writing, accounting principles, organization, human relations, psychology, and speech, for example, may be demanded because there is evidence that the knowledge or skill involved is widely used in business."[9]

## Limitations of the Study

The following is a list of limitations which affect this study.

1. There is difficulty in generalizing the results of a study done at one firm to other firms. The intent of this study is to identify the written and verbal communication activity of a group of employees in one firm which could be used as a data base for higher education curricular decisions when combined with the findings of similar studies.

2. The sample is limited by the amount of money, in terms of man-hours, which the participating firm was willing to invest. The researcher is limited to five employees per job level; therefore, the sample is not necessarily proportional to the number of employees in each job level.

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[9]R. H. Simonds, "Skills Businessmen Use Most," Nations Business, November 1960, p. 88.

3. All responses to the questionnaire and judgments when recording information in the communication logs will be based on employee self-perception. The reliance on self-perception may allow questions to arise because of employee's personal biases and ability to make certain judgments.

4. The sample will not be randomly selected from the total population. Each participant was selected and screened before participating in the study. This procedure will be used to help assure cooperation of all participants. Cambell and Stanley discuss this limitation under the heading of "selection."[10]

5. The communication log recording is not a typical part of the participant's working day; therefore, the reactive effects of the recording arrangements may cause employees to record more messages than will actually be encountered or to forget to record some messages because of the extra time it will take to complete the log. Campbell and Stanley discuss this limitation under the heading of "reactive arrangements."[11]

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[10]Donald T. Cambell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research, Chicago: Rand McNally College Publishing Company, 1963, p. 15.

[11]Ibid., p. 20.

## Definition of Terms

communication log: a method for employees to record job related written and verbal communications; the log pages include categories for the most commonly used communications, and the employee makes check marks in appropriate boxes to describe each communication situation; space is provided to record four messages per page; employees use more than one page per day.

written communication: the act of writing notes, memoranda reports, or letters to communicate job related information.

written communication methods:

a. short memorandum: 15-100 words long; less formal than a letter or report; used mostly for messages sent within an organization; "usually more straightforward without undue buildup and deliberate concern for special nuances of courtesy that are considered essential in a letter or report written to an outsider."[12]

b. long memorandum: 101 words or more in length; see short memorandum.

c. short report: 100-500 words in length; a report is usually a formal communication characterized by careful attention to audience and formal report style, including headings, side-headings, and format; reports are written to persuade and/or inform and may be sent within or outside an organization; may include a letter of transmittal, abstract, bibliography, and appendix.

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[12]Mary Robertson and W. E. Perkins, Practical Correspondence for Colleges, 4th Edition, Cincinnati: South-Western Publishing Company, 1974, p. 179

d. long report: 501 or more words long; see short report.

e. business letter: usually typed on organizational stationary and sent to someone outside the organization; writer usually uses formal style and format and pays careful attention to courtesy.

f. drawing notes: written notes by the superior of a draftsperson; usually written directly on a drawing; usually for suggesting changes in the drawing.

g. graphics: combination of writing and graphics usually occurs; a written communication complemented by graphs, charts, drawings, or other pictorial representations.

verbal communication: the act of talking informally or formally about job related information in person-to-person or group situations.

verbal communication methods:

a. person to person: dyadic experience; two people discussing job related information; could include open discussion, brainstorming, formal speech/presentations.

b. small group: 3-7 people; formal or informal discussion of job related information; could include open discussion, brainstorming, formal speech/presentations.

c. large groups: 8 or more people; see small group.

d. speech/presentation: verbal presentation of job related information; usually completed with charts, graphs, slides, or other graphic complements; could be given to other employees within

the same organization or to people outside an organization; could be information giving or persuasive or both.

e. telephone conversation: verbal communication about job related information using a telephone as the method of transmission; could be internal or external communication.

classification of messages:

a. information giving/receiving: those messages intended to convey job related information with no attempt to persuade the receiver; an exchange of needed information.

b. persuasive messages: those messages intended to convey job related information and persuade the receiver to accept the sender's position or point of view; the main characteristic is that the message must be intended to change the receiver's mind about job related information.

c. task messages: "those messages relating to the products, services, or activities of the organization--for example, messages about improving sales, markets, quality of service and quality of products; task messages relate to giving the employees all the information necessary for them to efficiently handle their jobs; they include such activities as training, orientation, goal setting, problem solving, and brain storming; task messages relate to the desired outputs of the system."[13]

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[13]Goldhaber, Op. cit., p. 13.

d. maintenance messages: "those messages which help the organization remain alive, such as policy or regulation messages; maintenance messages include commands, dictates, procedures for company activities, orders from superiors, etc."[14]

e. human messages: "those messages directed to a person's attitude, satisfaction, and fulfillment; human messages are concerned with feelings, interpersonal relationships, self-concepts, and morale; examples of human messages include superior's praise of subordinates, appraisal interviewing, and conflict-solving sessions."[15]

internal communication: written or verbal communication between two or more people employed by the same organization.

external communication: written or verbal communication between employees of an organization and people not employed by the same organization.

channel of communication: flow of messages in relation to an employee's job level; could be communications sent or received upward, downward, or horizontally.

technical/engineer curricula: programs, courses, seminars designed to educate people to function in jobs related to industrial technology and engineering; technical engineering graduates will "provide independently the support for engineering activities of a formulated or practical nature for which contingencies requiring

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[14] Ibid., p. 13.

[15] Ibid., p. 13.

decisions based upon full knowledge of the engineering design are uncommon";[16] industrial technology education emphasizes the applied aspects of industrial processes and personal leadership; engineering curricula emphasizes increased math-science content and utilization and increased conceptual activity and use of theory.[17]

self-perceived: in relation to questions on the questionnaire for this study, self-perceived refers to respondent's judgment when answering a question; respondent was not to weigh his decision with other's opinions.

job-level identification of subjects (highest to lowest):

1 - executive

2 - project manager

3 - lead engineer/planner

4 - engineer/planner

5 - junior engineer/planner

6 - senior engineer/planner

7 - senior draftsperson

8 - draftsperson/trainee

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[16] "Final Report: Engineering Technology Education Study," Engineering Education, January 1972, p. 349.

[17] Ibid.

## Organization of the Dissertation

This dissertation is organized into five chapters.

Chapter One, THE PROBLEM, includes an introduction, statement of the problem, research questions, hypotheses, importance of study, limitations, definition of terms, and organization of the dissertation.

Chapter Two, A REVIEW OF RELATED LITERATURE, includes a review of the literature relating to job levels and communication activity in organizations, a review of literataure relating to the definition of communication skills needed by employees in various levels of employment, and a review of the literature relating to communication skill needs of technical/engineer employees.

Chapter Three, RESEARCH METHODOLOGY, includes the description of the focus of the study, the nature of the sample used, the procedures for collecting the data, rationale for using those procedures, and the analytic techniques used.

Chapter Four, ANALYSIS OF RESULTS, includes a presentation of the information gathered as well as comments about its meaning and significance.

Chapter Five, SUMMARY AND CONCLUSIONS, contains a summary of the study, a discussion of the findings, and recommendations.

# CHAPTER II

# REVIEW OF LITERATURE

## Introduction

The literature relating to employee communication activity within organizations reveals varied approaches to defining that activity. However, the literature can be divided into two basic perspectives. The macro perspective provides a broad picture and the micro perspective provides a more specific identification of communication activity of individuals in organizations.

Much of the literature defines highly theoretical approaches which attempt to view organizations and communication activity from a macro perspective. These attempts to define communication activity include sociological viewpoints, social-psychological viewpoints, leadership matrices, administrative communication, communication psychology, management and information systems. Goldhaber provides an excellent review of approaches to defining communication activity from the macro perspective.[1] The value of the macro approach

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[1]Gerald M. Goldhaber, Organizational Communication, (Debuque, Iowa: W. C. Brown Company Publishers), 1974, pp. 3-47.

is that it provides a perspective from which one can further define specific communication activity.

The micro approach to defining communication activity is concerned with how individuals interact with other individuals. This perspective includes the defining of specific written, verbal, and non-verbal communications as they are utilized to perform a particular job. The micro approach describes the skills and methods being used and/or evaluates the effectiveness of those skills or methods. The micro approach includes such topics as the kind of written communication sent and received, the frequency of each kind, the job levels in which people are most likely to send or receive different kinds of communication, the time used to communicate, and the equipment used.

The importance of the micro approach as a complement to the macro approach is that it often leads to more specific information which can be utilized to make curricular decisions for communication courses in higher education. The review of the literature which follows will summarize some of the pertinent information concerned with the micro approach to defining communication activity of employees in organizations.

## Communication Activity of Employees in Organizations

Research that defines communication activity of employees in various organizations and job levels has been reported and summarized by Pettit. He states that: "An analysis of the insurance industry reveals that direct inquires, direct responses, refusals and short memo

reports are the commonest kinds of writing. Perhaps the writings in other businesses are equally specialized. Research in various industries will indicate what is actually being done and may lead to specialized training programs and textbooks. Davis found that executives at higher levels of an organization communicate more often with more people than executives at lower levels of the organization. Marting found that there existed little difference in management and non-management communication and that staff members transmit and receive communications no more often than line members. Burns conducted field research utilizing a self-reporting technique and found that his subjects spent an average of eighty-percent of their time in oral conversation."[2] Although Burns' main purpose was to study individual preferences for written or verbal communication, his findings point toward verbal communication skill needs.

Malra Treece surveyed professional secretaries to determine the written communication skills utilized by employees at the secretarial level. The findings indicate the frequency with which various kinds of messages were sent and the difficulties the secretaries experienced in written communication.[3] The significance of Treece's study is that it provides specific information that can be used when planning curricula for secretaries.

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[2]John Pettit, "Guidelines and Suggestions for Research in Business Communication," Journal of Business Communication, Summer 1971, Vol. 8, Number 4, pp. 22 & 50.

[3]Malra Treece, "Business Communication Practices of Professional Secretaries," Journal of Business Communication, Summer 1972, Vol. 9, Number 4, pp. 25-32.

Heugli and Tschirgi investigated the communication skill needs at the job entry level of 100 students with accounting, finance, marketing, management, production, and engineering majors at Ohio University. Mailed questionnaires and follow-up structured telephone interviews were used to collect the data. Along with identifying particular written and verbal communication skill needs of the respondents, the study compared the employee's responses with their supervisor's responses. The results of the study identified 13 communication skills used most frequently and indicated that the job entry level employees tended to over-evaluate their communication skill effectiveness.[4] The results were not separated by subject major areas of study.

Many studies have been completed which attempt to define communication skill needs of executives and managers. Belohov, Popp, and Porte surveyed the attitudes of personnel officers of 250 large organizations concerning the need for graduate level communication courses. The findings indicated that executives rated communication skills as the single most important function of management personnel. The respondents rated verbal, written and non-verbal skill needs and the importance of each for course work, hiring, and promotion.[5] The results of this study point to the importance of written, verbal, and

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[4]Harvey D. Tschirgi & Jon Huegli, "The Entry-Level Job--A Neglected Target for Our Business Schools?" Collegiate News & Views, Winter 1974-75, Vol. 28, Number 2, pp. 21-23.

[5]James Belohov, Paul Popp, and Michael Porte, "Communication: A View from Inside Business," Journal of Business Communication, Summer 1974, Vol. II, Number 4 pp. 53-59.

non-verbal communications but do not specifically define skill needs in each category.

Rainey surveyed executives to determine the use of the written communication skill of proposal writing. The study surveyed 50 corporate executives of firms with $1 million minimum sales volume. In addition, the study surveyed professors in selected universities to determine the emphasis placed on proposal writing in their curricula. The findings of the survey indicated that over 50 percent of the corporate executives rated the importance of proposal writing as "great" or "crucial." The findings also indicated that little emphasis was placed on proposal writing in collegiate level communication courses.[6] The findings of this study seem to indicate the importance of surveying people on the job to identify needed curricular changes.

Business executives were surveyed by Simonds to identify the knowledge and skills being used. Although the survey was concerned with knowledge and skills offered by 62 different college courses, the findings indicated that the letter writing and public speaking communication skills were very important to executives.[7] The contexts or formats in which the communication skills were used were not reported.

To summarize, the literature relating to communication skills needed by employees at particular levels of employment in different businesses was concerned with only a few levels and careers. Communication skill needs have been defined for some job entry level business graduates, professional secretaries, executives, and managers.

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[6]Bill G. Rainey, "Proposal Writing: A Neglected Area of Instruction," Journal of Business Communication, Summer 1974, Vol. II, Number 4, pp. 30-39.

[7]Simonds, op. cit., p. 88.

## Communication Activity of Technical/Engineer Employees

The Final Report: Engineering Technology Education Study of the American Society for Engineering Education made recommendations for course work in engineering technology and outlined the differences between engineering and engineering/technology programs. Various references to communication skill needs were made throughout the report, but the specific skills needed in either career area were not identified. Other than listing a recommended number of hours in English, the most definitive statement about communication skills was included in the definition of curricular areas. "Communication: subject matter content related to grammar, rhetoric, speech, technical writing, and other phases of language except literature."[8]

Ranous identifies the need for technical/engineer employees to develop communication skills when he writes that "teachers of engineering and most of the specialities are still finding their students lacking in fundamental language skills. . ."[9] However, he does not go on to define the specific written or verbal skills needed.

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[8]"Final Report: Engineering Technology Education Study," Engineering Education, January 1972, pp. 327-390.

[9]Charles Ranous, "In Memoriam Freshman English," Journal of Business Communication, Summer 1971, Vol. 8, Number 4, p. 4.

Holloran approached the communication skill needs of engineers by emphasizing the value of the study of rhetoric.[10] While his arguments seem logical, he did not define the specific kinds of written and verbal communication skills needed by engineers, nor did he define the contexts in which engineers would apply their knowledge of rhetoric to on-the-job performance.

Holland and Stead examined the differences between scientists and engineers. They hypothesized that "the form of written communication used by scientists will be different from the form used by engineers."[11] The findings indicated that "engineers' written communication differed in form (sentence completion, sentence length, number of sentences used, and evaluative word choice)."[12] While the study provided evidence about how the 14 engineers in the study wrote their responses, the information does not point toward specific curricular implications.

Estrin surveyed engineering alumni and fifty engineering and business companies to identify writing problems. The findings emphasize the need for engineers to be able to write well. Estrin recommends a careful study of basic sentence structure, grammar, spelling, simplicity of form, and other basic language skills. The specific writing problems which business and industry respondents cited were

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[10]Stephen M. Holloran, "Classical Rhetoric for the Engineering Student," Journal of Technical Writing and Communication, January 1971, Vol. 1, Number 1, pp. 17-24.

[11]Winford E. Holland and Bette A. Stead, "Exploring the Scientist-Engineer Conflict," Journal of Business Communication, Spring, 1972, Vol. 9, Number 3, p. 28.

[12]Ibid., p. 34.

lack of unity and logic, coherence, and adequate vocabulary. Ineffective sentence structure, improper punctuation, wordiness and repetition, and poor spelling were also cited as writing problems.[13] The results of this study may be useful for making curricular decisions if used in conjunction with information about the kind of written format that is used, such as letters and reports.

Curricular recommendations for technical/engineering students are found in documents from the United States Department of Health, Education, and Welfare; Office of Education; Bureau of Adult, Vocational, and Technical Education; Division of Vocational and Technical Education. The documents reviewed suggested curricula for two-year post high school architectural and building technology[14] and agricultural equipment technology.[15] These documents list the study of communication in the General Course category and included a communication course outline. However, the outline for suggested topics in the communication course for architectural and building construction technology seemed to be representative of the table of contents from any collegiate level freshman composition text. Such topics as orientation in use of school library, sentence structure, study of paragraph, improving reading efficiency, narration, description,

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[13]Herman A. Estrin, "The Need for and the Improvement of Technical Writing," Journal of Technical Writing and Communication, Vol. 1, Number 1, January 1971, p. 61.

[14]Architectural and Building Construction Technology: A Suggested 2-Year Post High School Curriculum, United States Department of Health, Education and Welfare, Office of Education, 1969, pp. 77-79.

[15]Agricultural Equipment Technology: A Suggested 2-Year Post High School Curriculum, United States Department of Health, Education, and Welfare, Office of Education, 1970, pp. 64-66.

and exposition do not specifically define the communication skills needed by employees in the career area. The agricultural equipment technology ccurse outline for communication skills was of the same general nature.

In an attempt to determine the current state of research, the researcher surveyed by letter selected authorities in the field of technical/engineering education.* Nine of the ten responses to the letter indicated the lack of specific information about the communication skill needs of technical/engineering graduates.

David Smith, Director of Drexel University's Engineering Management Program stated in his reply to the letter that: "The Drexel Engineering Management Program is designed quite specifically to meet the needs of the engineer turned manager. One of the abilities he has to acquire is the ability to communicate to and motivate his doers. While we have not made formal surveys to establish this, the need for improved communication skill for engineers has come through loud and clear everytime we talk to employers."[16]

In summary, the literature relating to the communication skill needs of technical/engineer employees does not specifically define those

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*See Appendix A for the letter.

[16]David Smith, Letter dated February 28, 1975.

skills. Generally, the literature treats those needs in general categories of written and verbal communication which are typical of many beginning level collegiate textbooks in English or communication.

Summary

The literature related to organizational communication activity can be divided into two categories, macro and micro perspectives. The macro approach provides a broad picture of organizational communication from the psychological, sociological, management science, information systems, systems management and other theoretical perspectives. The macro perspective is highly theoretical.

The micro perspective provides a more specific identification of communication skills as utilized by employees in various levels of employment in business and industry. The micro approach to defining such skills seems to provide more useful information for making curricular decisions. The most useful studies upon which curricular decisions may be based are those that survey the employees who are on the job and their supervisors, for example those studies done on managers, professional secretaries, and executives. The review revealed a scarcity of literature relating to the specific communication skill needs of technical/engineer employees at different levels of employment.

Goldhaber emphasizes that "noticeably missing from the organizational communication textbook market is an introductory textbook which emphasizes the kinds of communication behavior currently practiced

in most complex organizations."[16]

Keyser further emphasizes the scarcity of literature relating to specific communication activity. "A preliminary investigation of related literature revealed a noticeable dearth of research in the content area of business communication. A major reason for this would be that business communications is a relatively new area in the field of business. In view of this, there would be many unanswered questions regarding the specific course content and teaching methodology."[17]

Mager and Beach summarize that "the strategy of developing effective instruction then, is one that calls for performance oriented rather than subject matter orientation. The strategy is to use the job as the basis for deciding what will be taught and in what order and depth, rather than simply to present as much subject matter as possible in the alotted time."[18] The reviewed literature reveals that there is a scarcity of research which specifically defines communication skill needs for jobs in many career areas, including the technical/ engineer area.

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[16]Goldhaber, op. cit., p. ix.

[17]Marshall R. Keyser, "Business Communication: What Does It Include?" Journal of Business Communication, Summer 1972, Vol. 9, Number 4, p. 34.

[18]Robert F. Mager and Kenneth M. Beach, Jr., Developing Vocational Instruction, (Palo Alto, California: Fearson Publishers), 1967, p. 3.

# CHAPTER III

## RESEARCH METHODOLOGY

The research methodology of this study was designed to: (1) obtain information about the written and verbal communication skill needs of successful technical/engineer employees at various levels of employment and (2) obtain information which would further define the relationship between job levels and communication activity in organizations.

Selltiz stated that "research purposes in the social sciences may be categorized into four broad groupings: 1) to gain familiarity with a phenomenon, often in order to formulate more precise research problems or to develop hypotheses: 2) to portray accurately the characteristics of a particular individual, situation, or group: 3) to determine the frequency with which something occurs or with which it is associated with something else: 4) to test a hypothesis of causal relationship between variables. Studies related to the first purpose are generally termed 'formative' or 'exploratory.' Studies related to the second or third purposes are generally termed 'descriptive.' Studies related to the fourth purpose are generally termed 'experimental.' "[1]

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[1]Claire Selltiz, et al, Research Methods in Social Relations (New York: Holt, Rinehart and Winston, 1966). p. 50.

The purposes of this study relate to both 2 and 3 above; therefore, the research design is descriptive in nature.

## Population

The population for the study was the approximately 1060 technical/engineer employees of an architect/engineer firm in Jackson, Michigan. The secretarial/clerical employees in the firm were omitted from the study because their job duties did not correspond with the technical/engineer career area.

It is important that a community college identify and meet the needs of the people in its geographical area. The population for this study was chosen because the firm hires many community college and other higher education graduates and is, therefore, an important part of the geographical area of the community college. In order to identify and meet the needs within its geographical area, community college personnel should continually interact with business and other agencies in the community. The population for this study was such that it provided for positive interaction between higher education personnel and an employer of a large number of higher education graduates.

In addition, the firm was a logical choice because it is one of the largest employers in the Jackson area. The size of the firm helped assure that the range of job levels and duties for technical/engineer employees would be representative of jobs in which higher education graduates would find initial employment and advancement. Also, the large size of the firm helped assure that the job levels were representative of profit oriented, hierarchically structured organizations.

In relation to the architect/engineer industry, the firm was ranked number one for 1973 billings by Engineering News Record.[2]

Sample

The sample for this study was 41 successful technical/engineer employees of an architect/engineer firm in Jackson, Michigan.

The 1060 technical/engineer employees of the firm were stratified according to job levels by the Employment Specialist of the firm. There were eight job levels beginning with job level one, executive, and going down to job level eight, draftsperson/trainee. Within each job level, the Employment Specialist further stratified the employees into two categories according to their most recent performance rating; the employees were defined as "successful/promotable" or "marginal/unsuccessful" in their present position.

The "successful" employees in each job level were then screened by the Employment Specialist and their immediate supervisor. For each potential participant, the Employment Specialist and the supervisor subjectively decided whether or not the person would cooperate in the study. After this step, each potential participant was personally contacted by the same two people and asked if he would participate in the study. If the employee did not agree to participate, another employee on the same level was selected as outlined above until five people for job levels 1-7 and six people for job level 8 were selected as participants.

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[2]"The ENR 500," Engineering News Record, May 16, 1974, p. 57.

Table 3.1 shows the job level identification, the total number of employees in each job level, and the percent of employees for each job level in the sample for this study. At the time of the study there were 35 executives, 25 project managers, 57 lead engineers, 192 engineers, 361 junior engineers, 67 senior designers, 132 senior draftspersons, and 191 draftsperson/trainees in the firm. Of the total in each job level, five employees for job levels 1-7 and six employees for job level 8 were the sample for the communication log recording and questionnaire response. In percentages, the sample included 14% of the executives; 20% of the project managers; 8% of the lead engineers; 2.6% of the engineers; 1.3% of the junior engineers; 7.5% of the senior designers; 3.7% of the senior draftspersons; and 2.6% of the draftsperson/trainees.

TABLE 3.1

JOB LEVEL IDENTIFICATION, NUMBER OF EMPLOYEES IN EACH JOB LEVEL, PERCENT OF EMPLOYEES PER JOB LEVEL AS SAMPLE

| Job Level Identification | Number of Employees In Job Level | Percent of Employees In Sample |
|---|---|---|
| 1-Executive | 35 | 14.0% |
| 2-Project Manager | 25 | 20.0% |
| 3-Lead Engineer/Planner | 57 | 8.0% |
| 4-Engineer/Planner | 192 | 2.6% |
| 5-Junior Engineer/Planner | 361 | 1.3% |
| 6-Senior Designer | 67 | 7.5% |
| 7-Senior Draftsman | 132 | 3.7% |
| 8-Draftsman/Trainee | 191 | 2.6% |

Instrumentation

Two instruments, a communication log recording procedure and a three-part questionnaire, were developed by the researcher for collecting the data for this study.

The communication log recording form was developed in five steps. Step one included the identification, through a review of literature and interviews, of the most commonly used written and verbal communications and other communication activity pertinent to the research. For step two, a first draft of the log form containing the list of communication activities was designed by the researcher and reviewed by six experts.

The review experts for the log form included a community college speech teacher, a community college English teacher, a community college vice president, a management consultant, the Employment Specialist of the participating firm, and a professor of communication at Michigan State University.

The experts recommended changes in the layout and design of the log form. The form was changed so that participants would not have to read the complete check list for each message; the original list of communication activity categories was reorganized so that the participants answered only nine basic questions with sub-questions. The participants would record four messages per log page rather than the original eight.

Based on the experts' comments, the log form was redesigned and reviewed by the same experts for steps three and four. In step five, the log form was refined and printed in final form.*

*Sec Appendix B for the log form.

The researcher developed the questionnaire in four steps. The first step included a review of literature and interviews to identify a list of communication activities pertinent to this research. The second step included writing the questionnaire items and printing the first draft of the questionnaire. The third step included a review of the questionnaire by experts.

The experts who reviewed the questionnaire included the same experts who reviewed the log form and five additional people. The additional experts included the chairman of a community college business department, a technical assistant and the Personnel Assistant from the participating firm, an assistant administrator of a city police department, and the director of research consultation at Michigan State University.

The changes made in the questionnaire based on the experts' responses included changes in layout and design, wording of questions, and response format for each question. The changes in layout and design included the addition of spacing between questions, fewer questions per page, and dividing the questionnaire into three parts. The first two changes were made for ease of reading the questionnaire items; the third change in layout was made because the questionnaire was too long if administered as one part.

The changes in wording included the elimination of redundant sub-questions and adding better descriptors in the directions and some questions. The changes in response format included the addition of a five-point scale for all responses on the questionnaire. This latter change was important because it provided the respondents with a consistent answer format for all three parts of the questionnaire.

The fourth step in the development of the questionnaire included revision of the questionnaire items and final printing.

In general, Part I of the questionnaire was designed to gather information about the over-all importance of communication skills and the importance of various kinds of written and verbal communications sent and received. Part II was designed to obtain information about an employee's self-perceived ability to complete various planning and delivery stages of written messages. Part III of the questionnaire was designed to obtain information about an employee's self-perceived ability to complete various planning and delivery stages of verbal messages.

A five-point scale with word descriptors at the extremes of the scale was used for all items on the three-part questionnaire; the middle variances between the extremes were indicated by numbers only. On the page of directions for each of the three parts, the participants were reminded about the five-point scale, the word descriptors, and the middle variances on the scale.*

## Procedures

After the researcher's initial contact with the participating firm's Training Coordinator, the participating employees were involved in several communication situations before they recorded data. Each participant received a memorandum sent by the Employment Specialist of the firm which introduced the researcher and the study. Next, each participant received a memorandum from the Employment Specialist which

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*The questionnaire is Appendix C.

told them about an information meeting which the researcher and the Training Coordinator conducted to explain the study. The meeting was held on the Wednesday before the Monday on which the employees were to begin keeping their communication logs. Of the 41 study participants, 23 attended the meeting. The other 18 participants received the same information in personal interviews conducted by the researcher before information was recorded in the communication logs.*

The communication log recording, which was designed to obtain information about the frequency of various communication activity and the time used to plan and deliver various written and verbal communications, took place first. The participants were given a two-pocket folder containing log forms, four return envelopes addressed to the researcher, a page of directions, and a list of message definitions which was glued to the inside of the folder.

The participants were instructed to record all of their job related communications in their communication log for five working days beginning the Monday following the information meeting and continuing until Friday. If an employee missed a working day because of illness, vacation, or other personal business, he was instructed to record information during the next week until he had recorded information for five working days. The log sheets were returned to the researcher each day.

To help the participants keep the data recording up to date, the researcher designed several communications which were sent to the

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*Appendix D includes the memoranda and an outline of the meeting presentation.

participants during the week they were keeping the logs. The first communication, which the participants received on Monday morning, reviewed the directions for completing the logs and reminded the participants about the researcher's telephone extension and office at the firm. The second communication was received by the participants on Tuesday morning. It reminded them to complete certain parts of the log form. The third communication was received by the participants on Wednesday morning. It was designed to compliment them for their cooperation, and it reminded them about the researcher's office and telephone extension. The fourth communication was received by the participants on Friday morning. It reminded them to return their log folders and introduced the follow-up questionnaire.*

In addition to the above written communications, each participant was called on the telephone by the researcher on Monday afternoon or Tuesday morning of the week during which they were completing the logs. The objective of the call was to encourage the participants to keep their logs up to date; also, participants' questions were answered during the calls. The participants were instructed that the researcher's calls and memoranda were not to be recorded in their communication logs.

During the week that the participants were recording their communication logs, the researcher reviewed each log sheet as the sheets were returned. If a category was not checked, the researcher called the participant to get the omitted information. This follow-up procedure was important because it helped assure that all messages were recorded as accurately as possible.

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*See Appendix E for the memoranda.

The administration of the questionnaire, which was designed to obtain additional information about the self-perceived importance of various communication activity, was the second phase of the research. The questionnaire was sent to the same 41 participants who completed the communication logs.

Two days before Part I of the questionnaire was sent, a memorandum was sent to all participants. The memorandum reminded the participants that the questionnaire was important, urged accurate completion of the questionnaire, and reminded them about the researcher's office and telephone extension at the firm.*

The questionnaire was sent out in three different stages with the first part being sent out three weeks after the communication logs were completed. Parts II and III of the questionnaire were sent out after each participant returned the preceding part.

Part II was completed two times by 32 of the 41 participants. This was necessary because the employee identification numbers were omitted from Part II when it was mailed the first time; therefore, when the first responses to Part II were returned, it was impossible to identify the employee who completed the questionnaire. Eight employees who did not complete Part II the second time had signed their name or put some other identifying mark on the first response to Part II. When Part II was mailed the second time, a cover memorandum was attached which explained the error; the other parts of the questionnaire were identical to the first mailing of Part II.*

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*See Appendix F for the memorandum.

*See Appendix G for the cover memorandum.

When the questionnaires were returned to the researcher, they were checked for completeness. If an item was not completed, the researcher called the participant on the telephone and solicited a verbal response which was recorded on the questionnaire by the researcher.

For the statistical analysis of the questionnaire items, a total of 41 returned questionnaires were used for Part I; for Parts II and III, a total of 40 returned questionnaires were used because one participant did not respond to either Part II or III.

## Hypotheses

The written and verbal communication skill needs and the relationship between job level and communication activity of technical/engineer employees was tested using a communication log and questionnaire. The following was hypothesized:

Hypothesis 1: The employees' self-perceived importance ratings of over-all communication skills in their present position will increase as job levels go up.

Hypothesis 2: Employees who indicate that increased communication could improve job efficiency will select an increase in communication with higher levels as the method for increasing job efficiency more frequently that they will select an increase in communication with lower levels.

Hypothesis 3: The number of communications sent and received will increase as job levels go up.

Hypothesis 4: The number of different communication channels regularly used will increase as job levels go up.

Hypothesis 5: The frequency of external communications sent and received will increase as job levels go up.

Hypothesis 6: The mean time used to communicate will increase as job levels go up.

Hypothesis 7: The length of time used per message will increase as job levels go up.

Hypothesis 8: The combined frequency of using person-to-person, small group, and telephone communication methods will not vary by job level.

Hypothesis 9: The number of different communication methods used will increase as job levels go up.

Hypothesis 10: The self-perceived importance ratings of short memorandum, long memorandum, short reports, long reports, letters, person-to-person, small groups, large groups, and telephone will increase as job levels go up.

Hypothesis 11: The self-perceived importance rating of drawing notes and writing/graphics will increase as job levels go down.

Hypothesis 12: The self-perceived importance of employees' ability to plan and deliver information giving and maintenance messages will not vary by job level.

Hypothesis 13: The self-perceived importance of employees' ability to plan and deliver persuasive, task, and human messages will increase as job levels go up.

Hypothesis 14: The self-perceived need for help ratings for four different phases of written communication will increase as job levels go up.

Hypothesis 15: The self-perceived need for help ratings for four different phases of verbal communication will increase as job levels go up.

## Analysis

The appropriate statistical analyses were recommended by Dr. John Schweitzer, Acting Director, Office of Research Consultation, Michigan State University. To test the linear relationship between job level and a variable, the Pearson product-moment correlation coefficient was computed. The one-factor Analysis of Variance was

used to test for significant between job level differences when: (1) the hypothesis was concerned with a non-linear relationship, and (2) when r was not significant at the .05 alpha level. The t-test was used to see if a mean was significantly greater than zero for one hypothesis. The alpha level for all tests of significance was .05.

The responses to the log form and the three-part questionnaire were keypunched into computer cards. The statistical analyses were computed by the CDC 6500 at Michigan State University. Use of the Michigan State University computing facilities was made possible through support, in part, from the National Science Foundation.

# CHAPTER IV

## ANALYSIS OF RESULTS

The results of the study are presented in this chapter. The statistical test results, further analyses, and discussion are presented for each hypothesis. Hypotheses relating to overall communication activity are presented first and are followed by a presentation of the hypotheses relating to more specific communication activity by job level.

When the correlation coefficients were computed, the highest job level was level one and the highest rating was a five on a five-point scale. Therefore, the correlation coefficient between high job level and high ratings were designated with a minus sign.

### Hypothesis 1

The employees' self-perceived importance ratings of over-all communication skills in their present position will increase as job levels go up.

The correlation between job level and importance rating was -4.03. This is significant at the .05 alpha level with 39 degrees of freedom. Hypothesis 1 was supported by the data.

Table 4.1 shows the mean importance rating by job level. The mean importance ratings indicate that all job levels rated over-all importance

either 4 or 5 on a 5-point scale. Since a rating of 5 is the "very important" or highest rating, all employees perceived over-all communication skills as important in their present position. The highest job levels tended to perceive it as more important than the lower job levels even though the ratings lacked wide distribution.

TABLE 4.1 JOB LEVEL MEANS OF SELF-PERCEIVED IMPORTANCE RATINGS OF OVER-ALL COMMUNICATION SKILLS

| Job Level | Mean Importance Rating |
|---|---|
| 1 | 5.0 |
| 2 | 4.6 |
| 3 | 4.8 |
| 4 | 4.8 |
| 5 | 4.0 |
| 6 | 4.4 |
| 7 | 4.2 |
| 8 | 4.17 |

Hypothesis 2

Employees who indicate that increased communication could improve job efficiency will select an increase in communication with higher levels as the method for increasing job efficiency more frequently than they will select an increase in communication with lower levels.

This hypothesis was tested by using a t-test to see if the difference between the selection of increased communication with higher and lower levels was significantly greater than zero. Table 4.2 shows the results of the t-test. Although the mean difference was positive, indicating a tendency towards more frequent selection of increased

communication with higher levels, the mean difference was not significantly greater than zero. Hypothesis 2 was not supported by the data.

TABLE 4.2 t-TEST RESULTS OF COMPARING MEANS FOR EMPLOYEE SELECTION OF INCREASED COMMUNICATION WITH HIGHER AND LOWER LEVELS

| Mean Difference | Standard Deviation | t of the Mean | Significance Of The Mean |
|---|---|---|---|
| .636 | 1.940 | 1.538 | .139 |

In order to examine the frequency with which each job level selected the need for increased communication with higher and lower job levels, the job level responses were divided into 14 channels; Table 4.3 shows this breakdown. Thirty of the 41 respondents indicated that increased communication could improve job efficiency, and all 30 indicated the need for increased communication with both higher and lower levels. Each respondent could indicate the need for increased communication sent to or received from higher levels six times; of the 180 possible responses, 80 indicated the need to communicate more with higher levels. Forty-nine indicated the need to receive more communication from higher levels and 31 indicated the need to send more communications to higher levels. The respondents could also select increased communication with lower levels six times for a total of 180 possible responses. Of the 180, 64 indicated the need to communicate more with lower levels. Thirty-four indicated the need

TABLE 4.3 JOB LEVEL FREQUENCIES OF EMPLOYEE SELECTION OF INCREASED COMMUNICATION IN UPWARD, DOWNWARD, AND HORIZONTAL CHANNELS

| JOB LEVEL | TOTAL "YES" | FROM LEVEL UP 1 | 2 | 3 | FROM LEVEL DOWN 1 | 2 | 3 | FROM SAME LEVEL 0 | TO LEVEL UP 1 | 2 | 3 | TO LEVEL DOWN 1 | 2 | 3 | TO SAME LEVEL 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 N=5 | 4 | 3 | 3 | 2 | 3 | 1 | 1 | 3 | 3 | 0 | 0 | 2 | 0 | 0 | 2 |
| 2 N=5 | 5 | 5 | 2 | 1 | 3 | 2 | 1 | 4 | 4 | 1 | 0 | 4 | 3 | 1 | 5 |
| 3 N=5 | 3 | 2 | 1 | 0 | 3 | 2 | 2 | 3 | 2 | 0 | 0 | 3 | 2 | 2 | 3 |
| 4 N=5 | 4 | 3 | 1 | 1 | 4 | 3 | 2 | 3 | 1 | 0 | 0 | 3 | 1 | 1 | 2 |
| 5 N=5 | 3 | 2 | 2 | 0 | 1 | 0 | 0 | 3 | 3 | 3 | 0 | 2 | 1 | 1 | 3 |
| 6 N=5 | 3 | 2 | 3 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 7 N=5 | 5 | 4 | 2 | 2 | 0 | 0 | 0 | 2 | 3 | 3 | 1 | 0 | 0 | 0 | 1 |
| 8 N=6 | 3 | 3 | 2 | 3 | 1 | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 1 |
| TOTALS | 30 | 24 | 16 | 9 | 16 | 10 | 8 | 21 | 19 | 10 | 2 | 16 | 8 | 6 | 18 |

to receive more from, 30 indicated the need to send more to lower levels.

Seventy-five percent of the 41 respondents indicated that increased communication with higher job levels could improve job efficiency. When the need for increased communication with higher or lower levels was compared, increased communication with higher levels was selected 20% more often than increased communication with lower levels. In general, the respondents indicated that they perceived the need for more communication with higher job levels more frequently than the need for communication with lower levels. However, job levels three and four indicated the need for more communication with lower levels more frequently than the need for more communication with higher levels.

Hypothesis 3

The number of communications sent and received will increase as job levels go up.

The correlation between job level and the number of communications sent and received was -.342. This was significant at the .05 alpha level with 39 degrees of freedom. Hypothesis 3 was supported by the data.

Table 4.4 shows the number of communications sent and received by job level. While the significant correlation coefficient indicates a linear relationship, the job level frequencies in Table 4.4 indicate that that relationship is not perfect because job levels three, four and six have higher frequencies than the other job levels. The top two job level frequencies are deflated because employees in these two job levels indicated by notes or calls during the time that they were recording the log data that they were not recording "a great portion" of the incoming mail that they received each day because of time pressures. The high frequency of communication activity at job level six indicates that the frequency of communication activity cannot always be predicted by job level only.

TABLE 4.4 NUMBER OF COMMUNICATIONS SENT AND RECEIVED BY JOB LEVELS

| Job Level | Number of Communications Sent and Received |
|---|---|
| 1 | 489 |
| 2 | 543 |
| 3 | 674 |
| 4 | 502 |
| 5 | 300 |
| 6 | 706 |
| 7 | 180 |
| 8 | 274 |

Hypothesis 4

The number of different communication channels regularly used will increase with job level.

The correlation between job level and the number of different communication channels regularly used was -.464. This was significant at the .05 alpha level with 39 degrees of freedom. Hypothesis 4 was supported by the data.

Table 4.5 shows the means of the channels used by job level. There were six possible channels; a channel had to be used at least six times by an individual before it was considered "regularly used." Job levels three and four regularly used 5 channels; job levels one, two, and six regularly used at least 4.2 channels; job levels five, seven, and eight regularly used 3 or fewer channels. Some of the variance in the means can be accounted for by simple logic; the highest job levels do not have too many personnel above them, so that channel would not be used too often. The lowest job levels do not have too many personnel below them, so that channel would not be used too often. The middle job levels have more opportunities to communicate both above and below their levels. The means support this logic in that, except for job level five, the means of the middle job levels are higher than the highest and lowest job levels.

TABLE 4.5 JOB LEVEL MEANS FOR NUMBER OF COMMUNICATION CHANNELS REGULARY USED

| Job Level | Mean Channels Used |
|---|---|
| 1 | 4.4 |
| 2 | 4.2 |
| 3 | 5.0 |
| 4 | 5.0 |
| 5 | 3.0 |
| 6 | 4.6 |
| 7 | 2.0 |
| 8 | 2.3 |

Table 4.6 shows the frequency with which each of the six channels were used by job level. These frequencies support the logic presented in relation to the means of channels used and provide the opportunity for further analyses.

Horizontal communication occurred more frequently in relation to the frequency with which other channels were used in job levels four and five. Job level four had 26% of the communication activity in the horizontal channel compared with 30% for job level five. The percentages for horizontal communication for the other six job levels were between 13% and 19%. Generally, these data indicate that the horizontal channel is used more often in the middle job levels than it is in the highest and lowest job levels.

Five of the eight job levels (1,4 & 6) sent more communication downward than they sent upward; three job levels (5, 7, & 8) sent more communications upward than they did downward. The total messages sent

TABLE 4.6 JOB LEVEL FREQUENCIES OF USING SIX DIFFERENT COMMUNICATION CHANNELS

| Job Level | Channel 1 Sent Higher | Channel 2 Sent Lower | Channel 3 Sent Same | Channel 4 Received From Higher | Channel 5 Received From Lower | Channel 6 Received From Same |
|---|---|---|---|---|---|---|
| 1 | 24 | 177 | 40 | 31 | 202 | 34 |
| 2 | 54 | 175 | 61 | 46 | 100 | 29 |
| 3 | 49 | 245 | 43 | 54 | 217 | 48 |
| 4 | 58 | 166 | 67 | 54 | 104 | 68 |
| 5 | 85 | 29 | 58 | 103 | 22 | 45 |
| 6 | 148 | 252 | 66 | 140 | 213 | 43 |
| 7 | 30 | 14 | 17 | 82 | 8 | 13 |
| 8 | 70 | 7 | 20 | 153 | 11 | 21 |
| Totals | 518 | 1065 | 372 | 663 | 877 | 301 |

and received in the upward and downward channels differed only by 40 messages, which indicates that messages are, in general, flowing upward and downward with about the same frequency in this organization.

Hypothesis 5

The frequency of external communication sent and received will increase as job levels go up.

The correlation between job level and the frequency of external communication sent and received was -.426. This was significant at the .05 alpha level with 33 degrees of freedom. Hypothesis 5 was supported by the data.

Table 4.7 shows the number of external messages and the percent of total messages accounted for by external communication by job level. The total of external communications for the top four levels is more than three times the total for the lowest four levels. Job levels two and three communicated with people outside the firm more frequently than did the other six job levels. The total for job level one may be deflated because the executives indicated that they did not record a large portion of the incoming mail that they received each day.

The percent of total messages accounted for by external communications shows that a linear relationship holds in general. Also, the percentage for job level six indicated that while the level has a great deal of communication activity, 94% of it is within the firm.

TABLE 4.7 JOB LEVEL FREQUENCIES OF EXTERNAL COMMUNICATIONS SENT AND RECEIVED

| Job Level | Number of External Messages Sent and Received | Percent of Total Messages |
|---|---|---|
| 1 | 66 | 13% |
| 2 | 115 | 21 |
| 3 | 143 | 21 |
| 4 | 72 | 14 |
| 5 | 39 | 13 |
| 6 | 44 | 6 |
| 7 | 16 | 8 |
| 8 | 5 | 1 |

Hypothesis 6

The mean time used to communicate will increase with job level.

The correlation between job level and mean time used to communicate was -.626 which was significant at the .05 alpha level with 39 degrees of freedom. Hypothesis 6 was supported by the data.

The total time used and the mean time used in minutes by job level are shown in Table 4.8. Job levels one, two, three and six used at least 25% more time for communication than did job levels four, five, seven, and eight. The top three job levels used at least three times more minutes for communication than did the last two job levels. In general, the higher job levels used more time for communication. However, as the time used by job level six indicates, it cannot

always be assumed that higher job level personnel will be the only personnel using a great deal of time for communication activities in this firm.

4.8 JOB LEVEL TOTALS AND MEANS OF MINUTES USED FOR COMMUNICATION ACTIVITY

| Job Level | N | Total Time Used-Minutes | Mean Time Used-Minutes |
|---|---|---|---|
| 1 | 5 | 8199 | 1639.8 |
| 2 | 5 | 6248 | 1249.6 |
| 3 | 5 | 6907 | 1381.4 |
| 4 | 5 | 4891 | 978.2 |
| 5 | 5 | 2532 | 506.4 |
| 6 | 5 | 5747 | 1149.4 |
| 7 | 5 | 2067 | 413.4 |
| 8 | 6 | 1974 | 329.0 |

Hypothesis 7

The length of time used per message will increase as job levels go up.

The correlation between job level and length of time used per message was -.292 which was significant at the .05 alpha level with 39 degrees of freedom. Hypothesis 7 was supported by the data.

The mean time used per message by job level is shown in Table 4.9. A wide variance within job levels was found and further

analysis compared the total messages sent and received with total time used by job level; this comparison is shown in Table 4.10. Although the mean time for job level seven is still higher than would be expected for a low job level, the comparison indicates that, in general, the higher job levels used more time per message than lower job levels. The large within group variance suggests that the time used per message may be related more to specific jobs within job levels than to job levels.

TABLE 4.9 JOB LEVEL MEANS FOR MINUTES USED PER MESSAGE

| Job Level | Mean Time Per Message-Minutes |
|---|---|
| 1 | 18.16 |
| 2 | 11.58 |
| 3 | 13.12 |
| 4 | 11.14 |
| 5 | 9.06 |
| 6 | 9.6 |
| 7 | 12.38 |
| 8 | 9.2 |

TABLE 4.10 TOTAL MESSAGES, TOTAL MINUTES, AND MINUTES USED PER MESSAGE BY JOB LEVEL

| Job Level | Total Messages* | Total Time Used-Minutes | Time Used Per Message Minutes |
|---|---|---|---|
| 1 | 489 | 8199 | 16.76 |
| 2 | 543 | 6248 | 11.50 |
| 3 | 674 | 6907 | 10.24 |
| 4 | 502 | 4891 | 9.74 |
| 5 | 300 | 2538 | 8.46 |
| 6 | 706 | 5747 | 8.14 |
| 7 | 180 | 2067 | 11.48 |
| 8 | 274 | 2014 | 7.35 |

*Total Messages=total responses in internal and external categories on log form.

Hypothesis 8

The combined frequency of using person-to-person, small group, and telephone communication methods will not vary by job level.

The results of the ANOVA test are shown in Table 4.11. No significant difference was found at the .05 alpha level. The correlation between the two variables was -.304 which was not significant at the .05 alpha level with 39 degrees of freedom for this non-directional hypothesis. The hypothesis was supported by the data.

TABLE 4.11 ANOVA FOR JOB LEVEL COMBINED TOTALS OF PERSON-TO-PERSON, SMALL GROUP, AND TELEPHONE COMMUNICATIONS

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 4552.508 | 2.263 | .054 |
| Within | 33 | 2011.212 | | |

Table 4.12 shows the frequency with which each method was used, the combined total for each job level, and the percent of total messages accounted for by the three methods.

The totals for each method show that person-to-person communication was used at least four times more often than small group or telephone communication methods; telephone communication was used at least four times more often than small groups. Small groups were used at least five times by all job levels.

These communication methods accounted for an average of 80% of the total messages sent and received for all job levels. The lowest percent, 67%, was at job level one which could be expected because those employees are involved in a wider range of communication activities than the lower job levels.

TABLE 4.12 JOB LEVEL FREQUENCIES OF PERSON-TO-PERSON, SMALL GROUP, AND TELEPHONE COMMUNICATIONS, PERCENT OF TOTAL MESSAGES ACCOUNTED FOR BY THREE METHODS

| Job Level | Person-to-Person | Small Group | Telephone | Combined Total | Percent of Total Messages Sent and Received |
|---|---|---|---|---|---|
| 1 | 187 | 15 | 130 | 332 | 67% |
| 2 | 303 | 8 | 101 | 412 | 76 |
| 3 | 415 | 29 | 93 | 537 | 80 |
| 4 | 365 | 17 | 70 | 452 | 90 |
| 5 | 220 | 10 | 35 | 262 | 88 |
| 6 | 464 | 25 | 48 | 537 | 76 |
| 7 | 134 | 5 | 10 | 149 | 83 |
| 8 | 223 | 13 | 4 | 240 | 88 |
| Totals | 2311 | 122 | 491 | 2929 | Mean=80% |

Hypothesis 9

The number of different communication methods used will increase with job level.

The correlation between job level and number of different communication methods used was -.569 which was significant at the .05 alpha level with 39 degrees of freedom. Table 4.13 shows the means for the number of communication methods used by job level. Hypothesis 9 was supported by the data.

TABLE 4.13 JOB LEVEL MEANS FOR FREQUENCY OF USING DIFFERENT COMMUNICATION METHODS

| Job Level | Means of Methods Used |
|---|---|
| 1 | 7.6 |
| 2 | 7.4 |
| 3 | 6.4 |
| 4 | 5.4 |
| 5 | 4.8 |
| 6 | 6.4 |
| 7 | 4.2 |
| 8 | 4.1 |

Tables 4.14 and 4.15 show the frequency with which each of the 11 different methods were used by job level. Frequencies for the five written methods are presented in Table 4.14; frequencies for the six verbal methods are presented in Table 4.15. The totals indicate that verbal methods were used almost four times, 79%, more often than written methods, 20%. The total frequency of short memoranda, person-to-person, and telephone communication accounted for 86% of all of the messages for all job levels.

TABLE 4.14 JOB LEVEL FREQUENCIES OF USING FIVE DIFFERENT WRITTEN COMMUNICATION METHODS

| Job Level | Short Memo | Long Memo | Short Report | Long Report | Business Letter | Total By Job level |
|---|---|---|---|---|---|---|
| 1 | 97 | 16 | 25 | 10 | 15 | 163 |
| 2 | 33 | 17 | 5 | 11 | 65 | 131 |
| 3 | 37 | 16 | 6 | 13 | 68 | 140 |
| 4 | 38 | 4 | 1 | 0 | 2 | 45 |
| 5 | 29 | 4 | 2 | 0 | 2 | 37 |
| 6 | 124 | 27 | 8 | 12 | 18 | 189 |
| 7 | 25 | 8 | 0 | 0 | 0 | 33 |
| 8 | 37 | 5 | 0 | 1 | 0 | 43 |
| Totals | 420 | 90 | 47 | 47 | 170 | 781 |

TABLE 4.15 JOB LEVEL FREQUENCIES OF USING SIX DIFFERENT VERBAL COMMUNICATION METHODS

| Job Level | Person-to-Person | Small Group | Large Group | Speech Presentation 3-10 min. | Speech Presentation 11+min. | Telephone | Total By Job Level |
|---|---|---|---|---|---|---|---|
| 1 | 187 | 15 | 21 | 3 | 3 | 130 | 359 |
| 2 | 303 | 8 | 9 | 2 | 1 | 101 | 424 |
| 3 | 415 | 29 | 7 | 4 | 0 | 93 | 548 |
| 4 | 365 | 17 | 2 | 1 | 0 | 70 | 455 |
| 5 | 220 | 10 | 1 | 1 | 1 | 35 | 268 |
| 6 | 464 | 25 | 1 | 0 | 1 | 48 | 539 |
| 7 | 134 | 5 | 2 | 0 | 0 | 10 | 151 |
| 8 | 223 | 13 | 1 | 1 | 0 | 4 | 242 |
| Totals* | 2311 | 122 | 44 | 12 | 6 | 491 | 2986 |

*Totals may differ from total messages used in Table 4.4 because of recording errors in the logs; some respondents indicated the method used but did not indicate internal or external on the logs.

Of the six verbal methods, the person-to-person method was used almost five times more often than any other verbal method for all job levels; telephone communication was used at least four times more often than all other methods except person-to-person. Small group communication methods were used next most frequently. Large group and speech communication methods were used at least five times more often by the top three job levels than those methods were used by the other five job levels. The top three job levels used large

groups at least five times more often than the other five job levels with the greatest frequency occurring in job level one.

Of the five written methods, short memoranda were used at least two and one-half times more frequently than any other written method. Job levels one, two, three, and six used written methods at least two and one-half times more frequently than did the other four job levels. Short reports, long reports, and business letters accounted for the greatest difference between job levels; those methods were used at least three times more frequently by job levels one, two, three, and six than those methods were used by the other four job levels. Job levels two and three used business letters about four times more often than did the other six job levels.

The above analysis relates to communications sent and received; therefore, it relates to listening, reading, writing, and speaking skills. Since the primary focus of this study was written and verbal skill needs, further analysis was needed to separate those skills. Table 4.16 shows the frequency with which each written and verbal method was used to send messages by all job levels.

An analysis of the specific methods used to send messages indicates that the top four job levels and job level six used twice as many methods to send messages as did job levels five, seven, and eight. All job levels except level six sent verbal messages at least three times more frequently than they sent written messages. Short memoranda and person-to-person methods within the firm were used frequently by all job levels. The most difference in the use of methods between the top four job levels and the lower four job

TABLE 4.16 JOB LEVEL FREQUENCIES OF USING NINETEEN DIFFERENT COMMUNICATION METHODS TO SEND WRITTEN AND VERBAL MESSAGES

| Job Level | Short Memo Within | Short Memo Outside | Long Memo Within | Long Memo Outside | Short Report Within | Short Report Outside | Long Report Within | Long Report Outside | Letters-Persuasive | Letters-Information | TOTAL WRITTEN | Person-to-Person Within | Person-to-Person Outside | Small Group Within | Small Group Outside | Large Group Within | Large Group Outside | Speech-Within | Speech-Outside | Telephone | TOTAL VERBAL | TOTAL COMMUNICATIONS SENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13 | 4 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 22 | 132 | 5 | 13 | 3 | 33 | 4 | 6 | 0 | 53 | 249 | 271 |
| 2 | 15 | 1 | 6 | 0 | 3 | 0 | 8 | 0 | 0 | 7 | 40 | 201 | 3 | 11 | 0 | 10 | 3 | 4 | 0 | 32 | 264 | 304 |
| 3 | 20 | 2 | 2 | 1 | 0 | 2 | 2 | 1 | 0 | 8 | 38 | 239 | 4 | 26 | 0 | 3 | 3 | 0 | 4 | 28 | 307 | 345 |
| 4 | 15 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 223 | 4 | 28 | 0 | 3 | 3 | 0 | 3 | 13 | 277 | 299 |
| 5 | 11 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 12 | 138 | 0 | 15 | 0 | 1 | 0 | 1 | 0 | 5 | 159 | 171 |
| 6 | 88 | 10 | 13 | 2 | 4 | 0 | 8 | 0 | 0 | 10 | 135 | 321 | 1 | 27 | 0 | 0 | 0 | 0 | 0 | 24 | 373 | 508 |
| 7 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 51 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 54 | 63 |
| 8 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 86 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 94 | 100 |

levels was found with the use of the following verbal methods: person-to-person (outside the firm), large groups (outside the firm), and speech presentations. Job levels one and two delivered their speeches within the firm; job levels three and four delivered their speeches outside the firm.

Job levels one to four and six used at least four different methods to send written messages, while job levels five, seven, and eight used primarily short memoranda within the firm. Job level three used eight different methods, more than any other job level. Job level six used seven different methods; job level two used 6 different methods; job levels one and four used 4 different methods; job levels five, seven, and eight used 2 different methods. When these differences are considered in relation to Hypothesis 12 and 13, the data seem to indicate that in this firm the top four levels use a wide variety of methods to send messages and that those messages are more likely to involve more complex situations, for example persuasion, morale, and policies. Although job level six sent more messages than any other level, those messages were usually limited to information and task messages.

The rank order of job levels by number of messages sent was 6, 3, 2, 4, 1, 5, 7, 8. This rank order indicates that there is not a perfect linear relationship between job level and messages sent. The rank order of job levels by total written communications sent was 6, 2, 3, 1, 4, 5, 7, 8, which indicates that there is not a perfect linear relationship between job level and written messages sent. For verbal communication sent, the rank order is 6, 3, 4, 2,

1, 5, 7, 8, which indicates that there is not a perfect linear relationship between job level and verbal messages sent. Job level six had the highest frequency of communications sent; job levels two, three, four, and six sent at least twice as many messages as job levels one, five, seven, and eight. In relation to total messages sent and received, job levels one to six had at least 50% of their total communication activity accounted for by messages sent; job levels seven and eight had 33% and 35% of their total communication activity accounted for by messages sent.

While there was not a perfect linear relationship between job levels and total messages sent, the analysis of specific methods used and messages sent indicates that the top job levels may be more involved in more complex communication activities.

Hypothesis 10

The self-perceived importance ratings of short memoranda, long memoranda, short reports, long reports, letters, person-to-person, small groups, large groups, and telephone will increase with job level.

The correlation between job level and the self-perceived importance rating for each of the 10 methods was significant at the .05 alpha level with 39 degrees of freedom for each method. Hypothesis 10 was supported by the data. Table 4.17 shows the description of the method, the correlation coefficient, and the degrees of freedom for each method.

The correlation coefficient between job level and short memoranda was -.304 which was significant at the .05 alpha level.

TABLE 4.17 CORRELATION COEFFICIENTS FOR SELF-PERCEIVED IMPORTANCE RATINGS OF TEN COMMUNICATION METHODS AND JOB LEVEL

| Description | df | Correlation Coefficient |
|---|---|---|
| Short Memorandum | 39 | -.304 * |
| Long Memorandum | 39 | - .485** |
| Short Report | 39 | -.560** |
| Long Report | 39 | -.609** |
| Letters | 39 | -.624** |
| Person-to-person | 39 | -.500** |
| Small Group | 39 | -.537** |
| Large Group | 39 | -.651** |
| Speech/Presentation | 39 | -.658** |
| Telephone | 39 | -.429** |

* Significant at .05 alpha level.

** Significant at .01 alpha level.

The correlation coefficient for each of the following methods and job level was significant at the .01 alpha level: long memoranda/ -.485; short report/ -.560; long report/ -.609; letters/ -.624; person-to-person/ -.500; small group/ -.537; large group/ -.651; speech presentation/ -.658; telephone/ -.429.

Tables 4.18 and 4.19 show the means for the self-perceived importance ratings for each of the 10 written or verbal methods by job level. Table 4.18 shows the means for written communication methods; Table 4.19, verbal methods. A rating of 5 was the highest importance rating. Except for the telephone method, all of the importance ratings are a combination of two questionnaire items dealing with the same method. The sum of the two ratings was divided in half to get the importance rating shown in Tables 4.18 & 19.

The top four job levels rated all of the methods 3.7 or higher; of the total 40 ratings, 33 were four or higher. This indicates that the top four job levels perceive high importance for all ten methods, perhaps because they are more involved in all ten methods as was indicated in Tables 4.14 and 4.15.

The lower four levels rated three methods 3.7 or higher; of the total 40 ratings, 8 were four or higher; 21 ratings were 2.9 or lower. Person-to-person, small groups, telephone, and short memoranda were the methods that were ranked highest by the lower four job levels.

Long reports, large groups, and speech/presentation methods were rated 3.5 or higher by the top four levels and 2.8 or lower by the lowest four job levels. A wide variance between

TABLE 4.18 JOB LEVEL MEANS OF SELF-PERCEIVED IMPORTANCE RATINGS FOR FIVE DIFFERENT WRITTEN COMMUNICATION METHODS

| Job Level | Short Memorandum | Long Memorandum | Short Report | Long Report | Business Letters |
|---|---|---|---|---|---|
| 1 | 3.7 | 3.7 | 3.9 | 3.5 | 4.7 |
| 2 | 4.0 | 4.2 | 4.3 | 4.5 | 4.7 |
| 3 | 4.7 | 4.7 | 4.8 | 4.8 | 5.0 |
| 4 | 4.2 | 4.2 | 4.5 | 3.9 | 4.6 |
| 5 | 2.6 | 1.5 | 2.2 | 2.0 | 2.8 |
| 6 | 4.1 | 3.4 | 3.4 | 2.8 | 3.9 |
| 7 | 4.2 | 3.4 | 3.1 | 2.9 | 3.6 |
| 8 | 2.3 | 1.8 | 3.2 | 1.0 | 2.0 |

TABLE 4.19 JOB LEVEL MEANS OF SELF-PERCEIVED IMPORTANCE RATINGS FOR FIVE DIFFERENT VERBAL COMMUNICATION METHODS

| Job Level | Person-to-Person | Small Group | Large Group | Speech Presentation | Telephone |
|---|---|---|---|---|---|
| 1 | 4.7 | 4.3 | 4.6 | 3.8 | 4.4 |
| 2 | 4.8 | 4.8 | 4.8 | 4.6 | 4.6 |
| 3 | 4.9 | 4.7 | 4.5 | 4.2 | 4.8 |
| 4 | 4.9 | 4.5 | 4.2 | 3.8 | 4.8 |
| 5 | 4.4 | 4.2 | 2.2 | 1.5 | 4.0 |
| 6 | 4.6 | 3.7 | 2.9 | 2.8 | 4.8 |
| 7 | 4.1 | 3.5 | 2.8 | 2.6 | 3.8 |
| 8 | 3.3 | 2.8 | 1.8 | 1.0 | 2.5 |

the ratings of the top four and bottom four job levels was found for six of the ten methods: long memoranda, short reports, long reports, business letters, large groups, and speech/presentations.

Hypothesis 11

The self-perceived importance of drawing notes and writing/graphics will increase as job levels go down.

The correlation coefficients between job level and each of the two methods was significant at the .01 alpha level with 39 degrees of freedom. Hypothesis 11 was supported by the data.

Table 4.20 shows the description of the method, the degrees of freedom, and the correlation coefficient for each method.

4.20 CORRELATION COEFFICIENTS FOR DRAWING NOTES AND WRITING-GRAPHICS AND JOB LEVEL

| Description | df | Correlation Coefficient |
|---|---|---|
| Drawing Notes | 39 | .493* |
| Writing/ Graphics | 39 | .451* |

*Significant at .01 alpha level

Table 4.21 shows the means of the importance ratings by job level for both of the methods. Drawing notes are the primary method by which supervisors indicate needed changes on the drawings which the lower job level draftspeople produce. The importance of the communication method for the lowest three job levels was as hypothesized.

The term writing/graphics may have caused confusion for the respondents. The lower job levels perceived their drawings and their supervisors' memoranda about their drawings as writing/graphics. The higher job levels, especially job levels three, four, and five, perceived the term in relation to written communications combined with charts or other graphic representations. This variance in the definition may account for the high importance ratings for job levels three, four, and five.

TABLE 4.21 JOB LEVEL MEANS OF SELF-PERCEIVED IMPORTANCE RATINGS FOR DRAWING NOTES AND WRITING/GRAPHICS

| Job Level | Mean Importance Rating For Drawing Notes | Mean Importance Rating For Writing/Graphics |
|---|---|---|
| 1 | 1.6 | 2.2 |
| 2 | 2.8 | 3.2 |
| 3 | 4.6 | 4.4 |
| 4 | 3.6 | 4.2 |
| 5 | 2.6 | 4.0 |
| 6 | 4.4 | 4.4 |
| 7 | 4.4 | 4.0 |
| 8 | 4.6 | 4.6 |

Hypothesis 12

The self-perceived importance of employees' ability to plan and deliver information giving and maintenance messages will not vary by job level.

Tables 4.22 and 4.23 show the results of the ANOVA tests. No significant differences were found for information messages at the .05 alpha level. The correlation between job level and self-perceived importance of information messages was -.181 which was not significant at the .05 alpha level with 39 degrees of freedom. For maintenance messages, the ANOVA test results indicated a significant between level difference at the .05 alpha level. The correlation between job level and self-perceived importance of maintenance messages was -.251 which was not significant at the .05 alpha level. The difference, therefore, was non-linear. It was concluded that the self-perceived importance of employees' ability to plan and deliver information messages did not vary by job level but that the ratings did vary for maintenance messages.

TABLE 4.22 ANOVA FOR SELF-PERCEIVED IMPORTANCE RATINGS OF EMPLOYEES' ABILITY TO PLAN AND DELIVER INFORMATION MESSAGES

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 4.768 | 1.127 | .370 |
| Within | 33 | 4.227 | | |

TABLE 4.23 ANOVA FOR SELF-PERCEIVED IMPORTANCE RATINGS OF EMPLOYEES' ABILITY TO PLAN AND DELIVER MAINTENANCE MESSAGES

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 4.020 | 4.169 | .002 |
| Within | 33 | 1.204 | | |

Table 4.24 shows the job level means of the ratings for the two kinds of messages. The mean for information messages is the average of two questionnaire items. The ratings for all job levels except level eight were 3.8 or higher for information messages. Maintenance messages were rated 4.0 or higher by job levels one to three, six, and seven. Job levels four, five, and eight rated that kind of message 3.8 or lower.

TABLE 4.24 JOB LEVEL MEANS FOR SELF-PERCEIVED IMPORTANCE RATINGS OF EMPLOYEES' ABILITY TO PLAN AND DELIVER INFORMATION AND MAINTENANCE MESSAGES

| Job Level | Information Messages | Maintenance Messages |
|---|---|---|
| 1 | 3.8 | 4.2 |
| 2 | 4.5 | 4.0 |
| 3 | 4.6 | 4.4 |
| 4 | 4.3 | 3.8 |
| 5 | 4.3 | 1.8 |
| 6 | 4.6 | 4.8 |
| 7 | 4.1 | 4.0 |
| 8 | 3.3 | 2.6 |

Information must be available for employees regardless of job level, thus the similar ratings. Maintenance messages relate to organizational policies and procedures which are usually prepared by top job levels. However, job levels six and seven frequently communicate about procedures for producing correct drawings; therefore, they give a high rating to the importance of planning and delivering maintenance messages.

Hypothesis 13

The self-perceived importance of employees' ability to plan and deliver persuasive, task, and human messages will increase as job levels go up.

The correlation between job level and the self-perceived importance ratings for each of the three kinds of messages was significant at the .01 alpha level with 39 degrees of freedom for each. Table 4.25 shows the description of the message, the degrees of freedom and the correlation coefficient for each kind of message. Hypothesis 13 was supported by the data.

TABLE 4.25 CORRELATION COEFFICIENTS FOR SELF-PERCEIVED IMPORTANCE RATINGS OF EMPLOYEES' ABILITY TO PLAN AND DELIVER PERSUASIVE, TASK, AND HUMAN MESSAGES

| Description | df | Correlation Coefficient |
|---|---|---|
| Persuasive Messages | 39 | -.653 * |
| Task Messages | 39 | -.593 * |
| Human Messages | 39 | -.371 * |

* Significant at the .05 alpha level.

The correlation coefficient between job level and each kind of message was: persuasive/ -.653; task/ -.593; human/ -.371.

The job level means of the ratings are shown in Table 4.26. The top four job level means for all three kinds of messages were 3.9 or higher with 10 of the possible 12 ratings 4.1 or higher. The lower four job level means for all three messages were 3.8 or lower with eight of the 12 ratings 3.6 or lower.

TABLE 4.26 JOB LEVEL MEANS OF SELF-PERCEIVED IMPORTANCE RATINGS OF EMPLOYEES' ABILITY TO PLAN AND DELIVER PERSUASIVE, TASK, AND HUMAN MESSAGES

| Job Level | Persuasive Messages | Task Messages | Human Messages |
|---|---|---|---|
| 1 | 4.6 | 3.9 | 3.9 |
| 2 | 4.7 | 4.6 | 4.4 |
| 3 | 4.7 | 4.7 | 4.4 |
| 4 | 4.1 | 4.6 | 4.2 |
| 5 | 3.2 | 3.2 | 2.5 |
| 6 | 3.2 | 3.4 | 3.7 |
| 7 | 3.8 | 3.7 | 3.7 |
| 8 | 2.25 | 2.0 | 3.0 |

These three kinds of messages are more likely to be sent by upper level employees. Very few lower level employees will be involved in sending persuasive communications. Task messages relate to giving employees the information necessary for them to do

their jobs; therefore, higher level employees will be sending more task messages to lower level employees. Human messages relate to morale, and higher level employees are more likely to send those messages downward than lower level employees are to send human messages upward. The means for the three kinds of messages support this logic.

Hypothesis 14

The self-perceived need for help ratings for four different phases of written communication will increase as job levels go up.

The correlation coefficients for two of the four phases, collecting/analyzing data and content/coverage, were significant at the .05 alpha level. The correlation coefficient between job level and collecting/analyzing data was -.285 with 38 degrees of freedom. The correlation coefficient between job level and content/coverage was -.308 with 38 degrees of freedom.

The correlation coefficient between job level and need for help ratings was not significant for two of the four phases, organization and writing style. The correlation between job level and organization was .064 with 38 degrees of freedom. The correlation between job level and writing style was -.149 with 38 degrees of freedom.

Since the hypothesis related to a linear relationship between the means of all four phases and job level, it was concluded that a significant linear relationship was found for only two of the four phases.

In order to see if the job level means of the ratings for organization and writing style varied in a non-linear fashion, the one-factor ANOVA was used. The results were not significant at the .05 alpha level for either phase. The ANOVA test results are shown in Tables 4.27 and 4.28.

TABLE 4.27 ANOVA FOR SELF-PERCEIVED ABILITY RATINGS FOR WRITTEN COMMUNICATION--ORGANIZATION

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 11.657 | .531 | .804 |
| Within | 32 | 21.95 | | |

TABLE 4.28 ANOVA FOR SELF-PERCEIVED ABILITY RATINGS FOR WRITTEN COMMUNICATION--WRITING STYLE

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 204.453 | 2.168 | .064 |
| Within | 32 | 94.3 | | |

Table 4.29 shows the means for the need for help ratings for each of the four phases by job level. The means are the average rating of questionnaire items dealing with the same phase. Writing organization includes six responses per person; writing style, 13; collecting analyzing data, 9; content/coverage, 13. The ratings for each phase were summed and divided by the total responses to get an over-all need for help rating for each phase for each job level. A rating of 5 indicates that no help is needed as perceived by the respondent.

The sections of the questionnaire were not sensitive enough to indicate anything of significance about the self-perceived need for help by job level. Many of the respondents indicated that the questionnaire items were not related to their jobs because they did very little writing. Therefore, the ratings for some employees were simply guesses by the respondents about what their ability would be if they had to write messages.

TABLE 4.29 JOB LEVEL MEANS OF SELF-PERCEIVED ABILITY RATINGS FOR FOUR DIFFERENT PHASES OF PLANNING AND DELIVERING WRITTEN COMMUNICATIONS

| Job Level | Organi-zation | Style/ Quality | Collecting, Analyzing Data | Content/ Coverage |
|---|---|---|---|---|
| 1 | 3.86 | 4.0 | 4.28 | 3.9 |
| 2 | 3.53 | 3.61 | 3.64 | 3.75 |
| 3 | 3.8 | 4.1 | 4.37 | 4.23 |
| 4 | 4.3 | 4.63 | 4.57 | 4.55 |
| 5 | 3.63 | 3.12 | 3.6 | 3.26 |
| 6 | 3.66 | 3.93 | 3.97 | 3.78 |
| 7 | 3.76 | 3.2 | 3.4 | 3.18 |
| 8 | 4.1 | 3.9 | 3.7 | 3.49 |
| Means | 3.83 | 3.81 | 3.94 | 3.76 |

Hypothesis 15

The self-perceived need for help ratings for four phases of verbal communication will increase as job levels go up.

The correlation between job level and the ratings for the four phases of verbal communication were not significant at the .05 alpha level with 38 degrees of freedom for each phase. The correlation coefficients were: organization/ -.013; delivery/ .007; content-coverage/ -.154; collecting-analyzing data/ -.144. Hypothesis 15 was not supported by the data.

To see if the ratings varied in a non-linear fashion, one-factor ANOVA tests were used. The results of these tests indicated that there were no significant differences between levels. The ANOVA test results are shown in Tables 4.30-4.33.

TABLE 4.30 ANOVA FOR SELF-PERCEIVED ABILITY RATINGS FOR VERBAL COMMUNICATION--ORGANIZATION

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 10.053 | .66251 | .702 |
| Within | 32 | 15.175 | | |

TABLE 4.31 ANOVA FOR SELF-PERCEIVED ABILITY RATINGS FOR VERBAL COMMUNICATION-DELIVERY

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 80.785 | .600 | .751 |
| Within | 32 | 134.487 | | |

TABLE 4.32 ANOVA FOR SELF-PERCEIVED ABILITY RATINGS FOR VERBAL COMMUNICATION--CONTENT/COVERAGE

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 23.70 | .581 | .766 |
| Within | 32 | 40.750 | | |

TABLE 4.33 ANOVA FOR SELF-PERCEIVED ABILITY RATINGS FOR VERBAL COMMUNICATION--COLLECTING/ANALYZING DATA

| Sources | df | MS | F | Probability Less Than |
|---|---|---|---|---|
| Between Job Levels | 7 | 30.025 | 1.527 | .193 |
| Within | 32 | 19.650 | | |

Table 4.34 shows the means of the need for help ratings by job level. The mean is the average of several questions relating to the same phase. Verbal organization includes 5 responses per person; verbal delivery, 14; content/coverage, 9; collecting analyzing data, 7. The ratings for each phase were summed and divided by the total responses to get an over-all need for help rating for each phase. A rating of 5 indicates that no help is needed

as perceived by the respondents.

The section of the questionnaire was not sensitive enough to indicate anything of significance about the self-perceived need for help ratings by job level.

TABLE 4.34 JOB LEVEL MEANS OF SELF-PERCEIVED ABILITY RATINGS FOR FOUR DIFFERENT PHASES OF PLANNING AND DELIVERING VERBAL COMMUNICATIONS

| Job Level | Organi-zation | Delivery | Collecting, Analyzing Data | Content/ Coverage |
|---|---|---|---|---|
| 1 | 3.8 | 3.8 | 3.9 | 3.88 |
| 2 | 3.64 | 3.34 | 3.77 | 3.77 |
| 3 | 3.56 | 3.67 | 3.94 | 3.68 |
| 4 | 4.28 | 4.07 | 4.57 | 4.13 |
| 5 | 3.68 | 3.38 | 3.6 | 3.51 |
| 6 | 3.64 | 3.71 | 3.7 | 3.62 |
| 7 | 3.36 | 3.3 | 3.37 | 3.33 |
| 8 | 4.0 | 3.9 | 3.94 | 3.77 |
| Means | 3.74 | 3.64 | 3.71 | 3.85 |

## SUMMARY OF ANALYSIS

Hypothesis 1 was supported by the data. It was hypothesized that the employees' self-perceived importance ratings of over-all communication skills in their present position would increase as job levels went up. All employees ranked communication skills 4.0 or higher on a five-point scale. This indicated that employees in high and low job levels perceived a high importance rating for over-all communication skills, but the higher job levels tended to indicate a higher importance rating. The correlation between the two variables was significant in the direction hypothesized at the .05 alpha level.

Hypothesis 2 was not supported by the data. It was hypothesized that employees who indicated that increased communication could improve job efficiency would select an increase in communication with higher levels as the method for increasing job efficiency more frequently than they would select an increase in communication with lower levels. Thirty of the 41 participants indicated that increased communication could improve their job efficiency. When the need for increased communication with higher or lower levels was compared, increased communication with higher levels was selected 20% more often than increased communication with lower levels. However, the t-test results indicated that this difference was not significantly greater than zero.

Hypothesis 3 was supported by the data. It was hypothesized that the number of communications sent and received would increase as job levels went up. The correlation between the two variables was significant in the direction hypothesized at the .05 alpha level. A linear relationship between the two variables was found; however, the linear relationship was not perfect because job level six, a lower job level, sent and received more communications than any other job level.

Hypothesis 4 was supported by the data. It was hypothesized that the number of different communication channels regularly used would increase as job levels went up. The correlation between the two variables was significant in the direction hypothesized at the .05 alpha level. There were six possible channels and a channel had to be used six times by a participant before it was considered "regularly used." Job levels three and four regularly used 5 channels; job levels one, two, and six, a minimum of 4.2 channels; job levels five, seven, and eight regularly used 3 or fewer channels. The horizontal channel was used more often, in relation to the frequency with which the other four channels were used, by job levels four and five. The top four job levels and job level six sent more communication downward than they did upward. Job levels five, seven, and eight sent more communications upward than they did downward. The data indicated that there was a linear relationship between channels used and job level but that job level six is an exception.

Hypothesis 5 was supported by the data. It was hypothesized that the frequency of external communication sent and received would increase as job levels went up. The correlation between the two variables was significant in the direction hypothesized at the .05 alpha level. The top four job levels communicated more frequently with people outside the firm than did the lower four job levels. Job levels two and three had the highest frequency of external communication.

Hypothesis 6 was supported by the data. It was hypothesized that the job level means of the time used to communicate would increase as job levels went up. A significant correlation in the direction hypothesized was found between the two variables at the .05 alpha level. Job levels one to three and six used at least 25% more time for communication than did job levels four, five, seven, and eight. In general, the higher job levels used more time for communication than did the lower job levels; however, the high mean for job level six indicated that one cannot always assume that only high job level personnel will use a great deal of time for communication activity in this firm.

Hypothesis 7 was supported by the data. It was hypothesized that the length of time used per message would increase as job levels went up. The correlation between the two variables was significant in the direction hypothesized at the .05 alpha level. While the over-all linear relationship between the two variables was significant, the wide variance within job levels may indicate that the time used per message is related more to particular jobs within job levels

than to job levels.

Hypothesis 8 was supported by the data. It was hypothesized that the combined frequency of using person-to-person, small group, and telephone communication methods would not vary by job level. The ANOVA test results and the correlation coefficient were not significant at the .05 alpha level. These three communication methods accounted for an average of 80% of the total messages sent and received. The percent of total messages accounted for by these three methods ranged from 67% for job level one to 90% for job level four.

Hypothesis 9 was supported by the data. It was hypothesized that the number of different communication methods used would increase as job levels went up. The correlation between the two variables was significant in the direction hypothesized at the .05 alpha level. The means for job levels one and two were 7.6 and 7.4 while the means for job levels seven and eight were 4.2 and 4.1. Of the total written and verbal methods used, verbal methods were used almost four times more frequently than written methods for all job levels. The frequency of short memoranda, person-to-person, and telephone communications accounted for 86% of the methods used by all job levels.

Hypothesis 10 was supported by the data. It was hypothesized that the self-perceived importance ratings of short memoranda, long memoranda, short reports, long reports, letters, person-to-person, small groups, large groups, and telephone communications would increase as job levels went up. The correlation

between job level and the importance rating for each of the methods was significant in the direction hypothesized at the .05 alpha level.

The top four job levels rated all of the methods 3.7 or higher; of the total 40 ratings, 33 were 4.0 or higher. This indicates that the top four levels perceive high importance for all ten methods, perhaps because they are more involved in all ten methods.

The lower four levels ranked three methods 3.7 or higher; of the total 40 ratings, eight were 4.0 or higher while 21 ratings were 2.9 or lower. Person-to-person, small groups, telephone, and short memoranda were the methods that were rated highest by the lower four job levels.

Long reports, large groups, and speech/presentations were the methods that were rated 3.5 or higher by the top four levels and 2.8 or lower by the lowest four job levels. A wide variance between ratings of the top four and bottom four levels was found in six of the ten methods: long memoranda, short reports, long reports, business letters, large groups, and speech/presentations.

Hypothesis 11 was supported by the data. It was hypothesized that the self-perceived importance ratings of drawing notes and writing/graphics would increase as job levels went down. The correlation between the variables was significant in the direction hypothesized at the .05 alpha level. These two communication methods are used primarily by lower job level personnel to communicate about drawings; therefore, the methods should be more important for the lower job levels. The method "writing/graphics"

was rated 4.0 or higher by job levels three to five; the high rating for the method may have been caused by confusion with the definition of the term writing/graphics because those job levels do not usually work directly with drawings.

Hypothesis 12 was concerned with the self-perceived importance of employees' ability to plan and deliver information giving and maintenance messages. It was hypothesized that those ratings would not vary by job level. It was concluded that the ratings did vary for maintenance messages but not for information giving messages.

The results of the ANOVA tests for information messages were not significant at the .05 alpha level. The results of the ANOVA tests for maintenance messages were significant at the .05 alpha level. The correlation between job level and importance ratings for maintenance messages was not significant at the .05 alpha level which indicates that the difference was non-linear. Job levels one to three, six and seven rated maintenance messages 4.0 or higher.

Hypothesis 13 was supported by the data. It was hypothesized that the self-perceived importance of employees' ability to plan and deliver persuasive, task, and human messages would increase as job levels went up. The correlations between job level and the ratings for each of the three kinds of messages were significant at the .01 alpha level. The top four job level means of the importance

ratings for all three kinds of messages were 3.9 or higher with 10 of the possible 12 ratings 4.1 or higher. The lower job level means of all three kinds of messages were 3.8 or lower with eight of the 12 ratings 3.6 or lower.

Hypothesis 14 was concerned with self-perceived ability ratings for four different phases of written communication. It was hypothesized that the job level means for the ratings in each of the four phases would increase as job levels went up. It was concluded that a significant linear relationship was found for only two of the four phases.

There was little variation in the means for all job levels. The sections of the questionnaire were not sensitive enough to indicate anything of significance about the self-perceived needs for help by job level.

Hypothesis 15 was not supported by the data. It was hypothesized that the self-perceived need for help ratings for four different phases of verbal communication would increase as job levels went up. No significant correlation was found between job level and any of the four phases of verbal communication. The ANOVA test results indicated that there were no significant differences between job levels at the .05 alpha level.

The section of the questionnaire was not sensitive enough to indicate anything of significance about the self-perceived need for help ratings by job level.

# CHAPTER V

# SUMMARY AND CONCLUSIONS

## Summary

In Chapter 1 the contextual framework for this study was related to: (1) the information upon which certain higher education curricular decisions should be based; (2) the role of field research in organizations that employ higher education graduates; (3) the identification of communication skills needed by technical/engineering employees in various job levels; and (4) the relationship between job levels and communication activity in profit oriented, hierarchically structured organizations.

One of the goals of higher education is to provide learning experiences which will prepare graduates to perform in their chosen career area. One of the purposes of this study was to identify the communication activity of technical/engineer employees so that the needed commication skills could be identified for that career area; the information gained from this study could be used for making curricular decisions in higher education.

The second purpose of the study was to identify the relationship between communication activity and job level in an organization. The information gained from the study will add to knowledge about organizational communication as it relates to job levels and communication activity.

The population for the study was 1060 technical/engineer employees in an architect/engineer firm in Jackson, Michigan. The Employment Specialist of the firm divided the population into eight job levels beginning with the entry-level position of draftsperson/ trainee and going up to the executives. The job level identifications were: 1--executive; 2--project manager; 3--lead engineer/planner; 4--engineer/planner; 5--junior engineer/planner; 6--senior designer; 7--senior draftsperson; 8--draftsperson/trainee.

For each job level, the Employment Specialist of the firm further stratified the population according to the most recent performance rating for each employee. The employees were divided into two categories: (1) successful/promotable and (2) marginal/ unsuccessful. The participants for the study were selected from the first category. These "successful" employees were further divided into two categories by the Employment Specialist: (1) those most likely to cooperate in the study and (2) those not likely to give full cooperation. From the first category, 5 employees were selected for job levels one to seven and 6 employees were selected for job level eight.

The sample for the study was 41 successful technical/engineer employees in eight different job levels of an architect/engineer firm in Jackson, Michigan.

The data was collected in two phases. In the first phase, 41 employees recorded their job related communication activity for five working days. A communication log recording procedure developed by the researcher was used for this phase. Each day's record

was returned to the researcher. In phase two, the participants completed a three-part questionnaire which was designed by the researcher to obtain information about the self-perceived importance of various communication activity for each job level.

For the statistical analysis, there were 41 (100%) responses to the communication logs and Part I of the questionnaire. There were 40 (97.5%) responses to Parts II and III of the questionnaire because one participant in job level eight did not complete those parts. The statistical analysis was conducted using one-factor Analysis of Variance, Pearson product-moment correlation coefficient, and t-test. In the analysis, an alpha level of .05 was used to determine statistical significance.

Summary of Findings

Fifteen hypotheses were examined and tested.

Hypothesis 1 was concerned with the self-perceived importance ratings of overall communication skills by job level. It was hypothesized that the importance rating would increase as job levels went up. This hypothesis was supported by the data. Results indicated that all job levels rated the importance of overall communication skills 4.0 or higher on a five-point scale, but the higher levels tended to give a higher importance rating than the lower levels.

Hypothesis 2 was concerned with the self-perceived need for more communication with higher and lower levels to increase job efficiency. It was hypothesized that employees who indicated

that increased communication could improve their job efficiency would select increased communication with higher levels more frequently than they would select increased communication with lower levels. Thirty of the 41 respondents indicated that increased communication could improve job efficiency. The hypothesis was not supported by the t-test results even though the data indicated that employees perceived the need for increased communication with higher levels 20% more frequently than the need for increased communication with lower levels. Job levels three and four were the only ones that more frequently indicated the need for increased communication with lower levels than the need for increased communication with higher levels.

Hypothesis 3 was concerned with the number of communications sent and received by job levels. It was hypothesized that the number of communications sent and received would increase as levels went up. A significant linear relationship in the direction hypothesized was found between the two variables.

Hypothesis 3 was supported by the data. The data also indicated that the relationship was not perfect because job level six sent and received more communications than any other job level. While higher job levels, in general, sent and received more communication than lower levels, the frequency of communication activity cannot always be predicted by job level only. The rank order of job levels by frequency of communications sent and received was 6, 3, 2, 4, 1, 5, 8, 7.

Hypothesis 4 was concerned with the frequency with which employees regularly used different communication channels. It was hypothesized that higher job levels would regularly use more communication channels than lower levels. A significant linear relationship in the direction hypothesized was found between the two variables. Hypothesis 4 was supported by the data.

A channel had to be used six times before it was considered "regularly used." The mean of the channels used by the top four job levels was 4.65 compared to 2.97 for the lower four levels. A total of six channels was possible.

Hypothesis 5 was concerned with the frequency of external communications sent and received by job levels. It was hypothesized that higher levels would have a higher frequency of external communication activity. A significant linear relationship in the direction hypothesized was found between the two variables. Hypothesis 5 was supported by the data. The top four levels averaged 17.25 percent of their total communication activity for external communication; the lower four levels, 7 percent. Job levels two and three had the highest frequency of external communication.

Hypothesis 6 was concerned with the job level means of the time used for communication. It was hypothesized that higher levels would use more time for communication activity than lower levels. A significant linear relationship in the direction hypothesized was found between the two variables. Hypothesis 6 was supported by the data. However, job level six had a high mean which indicates that in some situations lower job levels will also use a great deal

of time for communication activities. The mean of the time used by the top four levels was at least two times greater than the mean of the lower four levels. The rank order of levels by the means of the minutes used to communicate was 1, 3, 2, 6, 4, 5, 7, 8.

Hypothesis 7 compared the mean time used per message and job level. It was hypothesized that the higher job levels would use more time per message than lower levels. A significant linear relationship in the direction hypothesized was found between the two variables. Hypothesis 7 was supported by the data.

The mean for the top four job levels was 13.5 minutes per message; the mean for the lower four levels was 10.0 minutes per message. Job level seven had the third highest mean. The rank order of levels by mean time used per message was 1, 2, 7, 3, 4, 5, 6, 8. Large within level variances were found which suggests that the time used per message may be related more to specific jobs than to job level.

Hypothesis 8 was concerned with the use of three verbal communication methods: person-to-person, small group, and telephone. It was hypothesized that the combined frequency of using these three methods would not vary by job level. No significant difference was found between levels. Hypothesis 8 was supported by the data. These three methods accounted for an average of 80% of the total messages sent and received by all job levels. The lowest percentage, 67%, was found in level one; the highest percentage, 90%, was found in level four.

Hypothesis 9 was concerned with the number of different

communication methods used by job levels. It was hypothesized that higher levels would use more methods than the lower ones. A significant linear relationship in the direction hypothesized was found between the two variables. Hypothesis 9 was supported by the data.

Levels one to four used an average of 6.7 methods; levels five to eight used an average of 4.8 methods. The rank order of job levels by the means of the methods used was 1, 2, 3, 6, 4, 5, 7, 8. There were 11 different written and verbal methods surveyed. Verbal methods were used almost four times more frequently than written methods. The total frequency of three methods, short memoranda, person-to-person, and telephone, accounted for 86% of all the messages sent and received by all levels.

Hypothesis 10 was concerned with the self-perceived importance ratings of ten different communication methods by job level. It was hypothesized that the mean importance rating for each method would increase as levels went up. A significant linear relationship in the direction hypothesized was found between the importance rating for each method and job level. Hypothesis 10 was supported by the data.

The ten methods were short memoranda, long memoranda, short report, long report, business letter, person-to-person, small group, large group, speech/presentations, and telephone. A rating of five was the highest possible rating. Levels one to four rated all ten methods 3.7 or higher; the lower four job levels rated three methods 3.7 or higher.

Hypothesis 11 was concerned with the self-perceived importance rating of two written communication methods, drawing notes and writing/graphics. It was hypothesized that the importance rating for those two methods would increase as job levels went down. The test results indicated a significant linear relationship in the direction hypothesized between the variables. Hypothesis 11 was supported by the data.

The mean of the importance ratings for drawing notes was 4.5 for the lowest three levels; the mean for the top three levels was 3.0. For writing/graphics, the mean of the importance ratings for the lowest three levels was 4.3; for the top three levels, the mean was 3.3. It was important to note that six of the eight job levels rated writing/graphics 4.0 or higher. The high rating from levels three to five may have been caused by respondents' confusion with the definition of the term.

Hypothesis 12 was concerned with the employees' self-perceived importance of their ability to plan and deliver information giving and maintenance messages. It was hypothesized that the self-perceived importance ratings would not vary by job level for these two kinds of messages. No significant between level difference was found for information messages. Information messages were rated 3.8 or higher by levels one to seven. A significant difference was found between job levels for maintenance messages. Maintenance messages were rated 3.8 or higher by levels one to four, six and seven. The correlation between level and rating for maintenance messages indicated that the relationship was non-linear. It was

concluded that the importance ratings for information messages did not vary by job level but that the ratings for maintenance messages did vary in a non-linear fashion.

Hypothesis 13 related to the self-perceived importance of an employee's ability to plan and deliver persuasive, task, and human messages. It was hypothesized that the means of the importance ratings would increase as levels went up. A significant linear relationship in the direction hypothesized was found between the means of the importance ratings for each kind of message and job level.

The mean for the top four levels for persuasive messages was 4.5; the mean for the lower four levels was 3.1. For task messages, the mean for the highest four levels was 4.5; for the lower four, the mean was 3.1. For human messages, the mean for the top four levels was 4.2; for the lower four, the mean was 3.2.

These three kinds of messages are more likely to be sent by upper level employees. Very few lower level employees will be involved in sending persuasive messages. Task messages relate to giving employees the information necessary for them to do their job; therefore, higher level employees will be sending more task messages to lower level employees. Human messages relate to morale, and higher level employees are more likely to send those messages downward than lower level personnel are to send human messages upward. The means of the importance ratings for the three kinds of messages supported this logic.

Hypothesis 14 related to the self-perceived need for help ratings for four different phases of planning and delivering

written communications. It was hypothesized that since higher level employees use written methods more often than lower levels, their need for help ratings would be higher. The job level means for the four phases were very similar; all of the ratings tended to be on the "no need for help" end of the rating scale for all levels. No significant relationship was found between level and ratings to support this hypothesis.

Hypothesis 15 related to the self-perceived need for help ratings for four different phases of planning and delivering verbal communications. It was hypothesized that the ratings for higher levels would be higher than those for lower levels. Since the means of the ratings for all job levels were at the "no need for help" end of the rating scale, no significant relationship between the ratings and job level were found to support this hypothesis.

## Conclusions

This part is divided into two sections. First, the conclusions about the relationship between job levels in an organization and communication activity will be presented. Second, the relationship between the findings of this study and higher education curricula will be presented.

### Conclusions--Job Level and Communication Activity

Several over-all relationships between job levels and communication activity in a hierarchically structured, architect/ engineer firm were found.

In relation to the self-perceived importance of overall communication skills, all employees in this study indicated a high importance rating, but higher level employees tended to give higher importance ratings. Employees recognize the importance of communication skills at all levels in this firm.

It has been stated in the literature relating to employee perception of message flow that employees generally perceive the need for more communication with higher level employees and that messages generally flow downward more frequently than upward in most organizations. The findings of this study support the generalization that employees perceive the need for increased communication with higher level personnel. The findings of this study also indicated that that generalization has exceptions because two job levels in this firm perceived the need for increased communication with lower level employees more frequently than the need for increased communication with higher levels. The findings of this study support the generalization that messages tend to flow downward more frequently than upward, although the difference was only 10%. Messages sent downward and received from higher totaled 1728 while messages sent higher or received from lower totaled 1395. In percentages, 55% of the messages in this firm involved downward communication while 45% involved upward communication.

Another question raised in the literature related to the frequency of sending and receiving messages by different job levels. The combined frequency of messages sent and received by levels in this firm indicates that the frequency of sending and receiving

communications cannot always be predicted by job level. When the frequency of messages sent was analyzed, the findings indicated that the top six levels sent more messages than they received. The top four job levels sent 30% more messages than the lower four job levels. In general, the frequency of sending and receiving messages seems to be more related to specific jobs than to job levels, but the frequency of sending messages is higher in the top job levels.

Channels used by different job levels are often investigated in the study of organizational communication activity. It has been generalized that upper level personnel will communicate with more people than lower level personnel. This generalization was supported by the findings of this study because higher level personnel used more communication channels than lower level personnel, and higher level personnel communicated more often with people outside the firm. In relation to the use of the horizontal channel, it can be concluded that the channel is not used too often by most job levels in this firm. Only the middle two job levels used it for a high percentage of total communication activity. The findings also indicate that employees perceive the need for increased communication in the horizontal channel.

Total time used for communication activity in organizations is often investigated. The findings of this study indicate that the 41 participants used 643.6 hours for communication activity which is an average of 16 hours per employee per week. The average time for the top four levels was 22 hours per week while the average for the lowest four levels was 10. The range of time used was 6 hours

per week for level eight to 27.3 hours per week for executives. Although there were some variations, it can be concluded that higher levels tend to use more time for communication activities than lower levels. In relation to time used per message, it can be concluded that looking at job level is not always a sure method of predicting how much time employees will use for each message. Although the higher job levels tended to use more time per message, there was a wide variance within job levels. The range of time used per message was 18.16 minutes for level one to 9.2 minutes for level eight.

Questions about the use of verbal and written methods are often raised by researchers of organizational communication. It can be concluded from the findings of this study that verbal communication was used more often than written communication. Verbal methods accounted for 79% of the total messages sent or received. In terms of percent of total messages, verbal methods accounted for 67% of the messages for job level one and 90% of the messages for job level four; the percentage figure for the other six levels was between those two percentages. The person-to-person verbal method was used at least four times more frequently than any other written or verbal method. Of the eleven written and verbal methods surveyed, four were used often by all levels: short memoranda, person-to-person, small groups, and telephone. Only the top three levels and level six frequently used long memoranda, short reports, long reports, business letters that persuade, large groups, and speech/presentations.

Conclusions--Higher Education Technical/Engineer Curricula

The findings of this study provide information that should be used for making decisions about appropriate communication curricula for full-time higher education technical/engineering students as well as returning students.

The employment specialist of the firm identified job level eight, draftsperson/trainee, as the level at which two-year college graduates would be hired in this firm. The findings of this study indicate that these graduates should be prepared to use several communication skills. Two-thirds of the communication activity at the job-entry level will be receiving messages. Person-to-person messages will be communicated most often and will involve information relating directly to the job. Therefore, listening skills should be developed. Also, the graduate at job-entry level will find that there is frequent use of small groups, so the principles of group dynamics should be mastered. The job-entry level employee may send some written communication in the form of short memoranda within the firm with an occasional long memoranda. Consequently, the student's ability to convey job related information in short memoranda should be developed. The graduate will not have to write reports and letters until he is promoted to job level six, which will take about five years in this firm. Therefore, rather than use time in report writing courses, the time could better be spent developing verbal communication skills, with only a brief introduction to reports and letters.

Along with on-the-job communication activities, the Employment Specialist of the firm indicated the need for graduates to be prepared to write good letters of application and a resume', and to be prepared to participate in job interviews for initial hiring and later promotions.

The required communication courses for technical students who are going to graduate with a two-year degree and seek employment in a firm similar to the one surveyed should include the following topics: (1) listening; (2) reading and comprehension skills: (3) verbal information giving and receiving using small group and person-to-person methods; (4) written communication--short memoranda that give information and an introduction to reports and letters; (5) employment skills--letter of application, resume', and personal interviewing; (6) role and importance of communication in organizations; (7) telephone usage.

The four-five year career development plan for the employee with a two-year technical degree should include the refinement of other written and verbal communication skills. As the Employment Specialist of this firm pointed out, it will take a beginning technical graduate about five years to reach level six, which is Senior Designer. When the employee reaches that level, the communication skills needed are substantial.

By the time a person is ready for promotion to job level six, the following communication skills must be refined in addition to those mentioned for initial employment: (1) written communication--internal long memoranda and short reports; external letters and long

memoranda; (2) verbal communication--person-to-person and small group methods for information and persuasive messages. In general, the employee promoted to this level will use almost one-half of his working time for communication both within and outside the firm. He will be sending communications almost as frequently as he will be receiving communications. In addition, his communication activity will be involved with both higher and lower level employees, so it is important that the employee develop the ability to synthesize job related information and clearly convey that information to people above and below his job level.

At level six in this firm, the employee will also become involved in some forms of supervision, which means that the kind of messages he will be sending will also change. Rather than dealing only with information, the employee will begin sending maintenance and human messages to his subordinates. These messages include organizational policy and regulation information and employee morale messages. Therefore, the employee should develop a keen awareness of the skills needed for persuasion as it relates to maintenance and human relations messages. The person will also become involved in performance rating and appraisal interviews on a limited basis. This added responsibility indicates the need to refine the communication skills relating to conducting personal interviews.

In general, the four-five year career development program for two-year technical graduates should be designed so that the employee can assume a great deal of responsibility for communicating

with both higher and lower levels. He should develop expertise in writing short memoranda, long memoranda, short reports, and letters that include elements of information giving and persuasion. He should develop expertise in verbal communication skills as those skills relate to information giving, task, maintenance, and human messages. He should also develop the ability to effectively communicate with people outside the firm. These long-range needs should be met within four-five years through company sponsored seminars or additional classes in higher education institutions.

The above related to a two-year graduate with a technical degree. The following will relate to a four-year technical/engineer graduate who seeks initial employment in a firm similar to the one surveyed in this study.

The Employment Specialist of the firm indicated that a four-year engineering graduate would be hired at job level five, Junior Engineer/Planner, and that he would be promoted to job level four within five years. The highest possible promotion within the first five years would be to job level three, Lead Engineer.

The beginning engineer in this firm will need written and verbal communication skills. The writing skills relate primarily to short memoranda that give information within the firm and business letters that give information. The findings indicate that only rarely will the beginning engineer be responsible for preparing reports, rather he will be assisting others in preparing reports. The verbal communication skills needed relate to information messages both within and outside the firm. The methods used most

frequently are person-to-person, small groups, and telephone. Within this job level, however, communication skill needs will increase as the engineer gains experience with the firm.

The findings indicate that a beginning engineer must have the ability to write short memoranda and business letters that give information. The beginning engineer must also be able to communicate effectively in person-to-person, small group, and telephone situations. He will be giving or receiving information. In addition, he must be aware of the importance of overall communication activity and develop keen reading comprehension and listening skills because he will be receiving a great deal of information.

Within 3-5 years the engineer in this firm should be prepared to use a wide range of written and verbal communication skills to give information, persuade, and supervise. When the engineer is promoted to level four, Engineer/Planner, his job responsibilities greatly expand. At that level, he must be able to use all of the communication skills surveyed in this study. He will use written communications (memoranda, reports, and letters) both within and outside the company to give information and persuade. He will use verbal communication (person-to-person, small groups, large groups, speech/presentations, and telephone) within and outside the firm to give information and persuade others. Also, the engineer at this level in this firm will be supervising. Therefore, it is important that his human relations skills be developed so that he can effectively relate to subordinates in performance

appraisals and other essential supervising roles.

The findings of this study indicate that a beginning engineer must be able to write short memoranda and letters that give information, and communicate verbally in person-to-person and small group situations within the firm. Within 3-5 years the engineer may be promoted to a level at which he must be able to use a wide variety of communication methods to give information and persuade.

These findings indicate that the most essential learning experiences that would benefit the engineers who are seeking initial employment in a firm similar to the one surveyed are those experiences that develop the engineer's ability to communicate effectively with person-to-person, small group, telephone, and short memoranda methods. These basic methods should be combined with higher level report writing, speaking, large group methods, and letter writing to give information and persuade. Since it will take at least three years before the engineer actually begins using these high level communication skills, perhaps the courses dealing with them could be postponed until the last year of a four year curriculum or only introduced during the four years of college. In either case, the engineer should become involved in seminars relating to those skills during his first few years of employment so that when promotion time arrives he will be ready with recent experiences in the needed communication skills.

Recommendations

1. Verbal communication in person-to-person and small group situations should be emphasized in both two-year and four-year technical/engineering programs because beginning level employees in these career areas will be using those methods for at least 80% of their communication activity. Required or core courses should be designed so that students are given the opportunity to develop techniques that will help them effectively give and receive information in those verbal communication situations.

2. During the first 3-4 years, graduates will be receiving information more often than they will be giving information. Listening and reading skills should be developed so that graduates can decode communications and synthesize the information. The messages will contain technical specifications and descriptions, so the content of the material used in the classroom should be geared to that kind of information.

3. The writing experiences should be geared so that students learn to write short, informative paragraphs. The basics of sentence structure and expository writing should be emphasized with only an introduction to longer reports in the core courses. The content should be geared to technical specifications and descriptions.

4. A great deal of the writing done by beginning level technical/engineering employees will be handwritten. Students should develop legible handwriting. The importance of neatness in their handwritten communications should be emphasized.

5. Employment information and techniques of getting a job should be thoroughly mastered by both two-year and four-year graduates. One of the most important communication situations that the graduate will encounter will be getting a job. Writing a letter of application and a resume' and participating in employment interviews should be emphasized in core courses.

6. The four-year engineer graduate should be given the experience of writing informative business letters. This experience should include an overview of letter style and format and thorough development of effective paragraph structure for letters.

7. Effective telephone usage should be emphasized for calls both within and outside the firm.

8. For long range career development of both two-year and four-year technical/engineer graduates, experience in sending and receiving more complex messages with more complex methods should be developed. It will take at least five years before graduates encounter complete responsibility for reports, speeches, and large group participation. The two-year technical student should gain skill in those areas after he is on the job through company seminars or additional classes in higher education institutions. The four-year engineering student may benefit by course work in these areas if it is postponed until the last year of his study.

9. The importance of overall communication skills and the role of different kinds of communication activity should be emphasized as part of core courses for both types of students. The

content of such study should include such topics as the use of communication channels, the role of verbal, non-verbal, and written communications as they apply to organizations in which the graduate might be employed. This study should be a relatively small portion of the first communication course.

10. English teachers should carefully review the rationale for requiring long papers (300 words or more) as the primary assignment in composition courses in two-year colleges, especially the courses designed for terminal degree students. Most graduates, including the technical students, will not write anything that long for 3-5 years after graduation and then the content, style, and format will be governed by company policies. The experience of writing longer communications might be more beneficial to the student if that experience were provided through specialized seminars for those students who recognize the need.

Implications for Further Research

1. Self-perceived ability ratings for planning and delivering written and verbal communications do not appear to indicate accurate descriptions of employees' on-the-job performance. Further research should compare self-perceived ability ratings with supervisor's ratings or an analysis of communications planned and delivered by the employees.

2. Daily recording of employee communication activity apparently provides an accurate description of the frequency of communication activity if (1) a follow-up procedure is used to assure

that all important communication activity occurred during the recording time, and (2) an efficient procedure is used so that employees can record routine, frequently occuring messages. Further study of efficient methods of recording communication is needed.

3. Further research comparing successful and marginal employees is needed. The comparison may indicate whether or not effective communication skills are a major consideration in employee performance appraisals. Also, the comparison may indicate those subject areas that should be changed to help graduates become successful.

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# APPENDICES

# APPENDIX A

## Letter to Authorities

APPENDIX A

Jackson Community College

2111 EMMONS ROAD ● PHONE 517-787-0800

JACKSON, MICHIGAN 49201

Perhaps you would help me locate information about the written and oral communication skills needed by technical and engineer employees at various levels of employment. Specifically, I am interested in finding out what studies have been completed and the methods used to identify the written and oral communication skills needed by technical and engineer employees.

As part of my dissertation at Michigan State University, I am completing an in-depth study of 51 employees of a large architect/engineer firm. The purposes of my study are to identify the communication skills needed by those employees and to study the relationship between job level and communication activity. The employees are in 10 different levels of employment from entry level to vice president.

Hopefully, my study will help define the curricula needed for preparing technical and engineer students in the area of communication. To date, I have not been able to locate any previous research, formal or informal, which attempted to identify specific communication skills needed by technical and engineer employees.

Perhaps you could help me locate such studies or related information. I would appreciate your suggestions, information and comments.

Very truly yours,

Henry S. McKeown
Associate Professor, English

# APPENDIX B

## Log Recording Form

DATE _____ DAY# _____ PAGE _____ NAME _____

Complete one column for each message. Place a check mark or a name in the appropriate box for each message sent or received.

| | | Message | Message | Message | Message |
|---|---|---|---|---|---|
| 1. | INTERNAL COMMUNICATION a | | | | |
| | EXTERNAL COMMUNICATION b | | | | |
| 2. | Information Giving Message a | | | | |
| | Persuasive Message b | | | | |
| 3. | TASK Message a | | | | |
| | MAINTENANCE Message b | | | | |
| | HUMAN Message c | | | | |
| 4. | SENT to/higher job classification a | | | | |
| | SENT to/lower job classification b | | | | |
| | SENT to/same level c | | | | |
| Names | REC'D. from/higher job classification a | | | | |
| 5. | REC'D. from/lower job classification b | | | | |
| | REC'D from/same level c | | | | |
| | WRITTEN COMMUNICATION | | | | |
| | Short Memo (15-100 Wds.) | | | | |
| | Long Memo (101-or more wds.) | | | | |
| 6. | Short Report (100-500 wds.) | | | | |
| | Long Report (501 or more wds.) | | | | |
| | Business Letter | | | | |
| | ORAL COMMUNICATION | | | | |
| | Person to person | | | | |
| | Small Group (3-7 people) | | | | |
| 7. | Large Group (8 or more people) | | | | |
| | Speech/Presentation (3-10 minutes) | | | | |
| | Speech/Presentation (11 min. and up) | | | | |
| | Telephone Conversation | | | | |
| 8. | Estimate time used for planning and execution | | | | |
| 9. | Comments: | | | | |

# APPENDIX C

## Questionnaire

P A R T  I - - COMMUNICATION QUESTIONNAIRE

Respond to the following questions by placing an "X" in the box which best reflects your answer. Some questions will require more than one "X" to answer; the directions will indicate specifics.

You will be responding, in most cases, on a five-point scale which represents degrees of difference between "No Importance" and "Very Important." The scale is numbered from 1 to 5, with five being "Very Important." You are to respond by checking box 1, 2, 3, 4, 5. There are no word descriptors for numbers 2, 3, 4; use those numbers for variances between the extremes of 1 and 5.

When you complete the questionnaire, return it to H. McKeown, Personnel. Please return this questionnaire on Tuesday, March 4, 1975.

You may call me on extention 2676 if you have any questions, or you may visit my office on the first floor. Thank you for your cooperation.

The following questions ask you to rate your ability to write various kinds of messages. Your rating is a five point scale ranging from "Need Lots of Help Here," (1), to "No Help Needed, " (5). Numbers 2, 3, and 4 are variances between the two extremes. Be sure to consider each line carefully, then place an "X" in the box which best reflects your rating.

You should mark only one "X" for each line.

The definitions for the various kinds of messages are below. You might want to refer to them for answering parts of question # 14.

DEFINITIONS

INFORMATION giving/receiving--Those messages intended to convey job related information with no attempt to persuade the receiver; an exchange of needed job related information.

PERSUASIVE--Those messages intended to persuade the receiver to accept the sender's position or point of view; could be used in combination with many other kinds of messages; main characteristic-that the message must be intended to change the receiver's mind about job related information.

1. When you were hired by CAI, how important do you think that your job-related written and oral communication skills were to the person hiring you?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

No Importance Very Important

2. If you have received a merit increase or promotion since working for CAI, how important were your job-related written and oral communication skills to the person making the decision about the increase or promotion? (If no increase or promotion, go directly to question 3).

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

No importance Very Important

3. Rate the importance or your ability to use written and oral communication skills in your present position.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

No Importance Very Important

4. If you wanted to communicate about your job related activities from your present position, at which level (s) would you feel free to communicate? (You may check more than one box).

| | |
|---|---|
| 1 job level upward---------- | ☐ |
| 2 job levels upward---------- | ☐ |
| 3 job levels upward---------- | ☐ |
| 1 job level downward---------- | ☐ |
| 2 job levels downward---------- | ☐ |
| 3 job levels downward---------- | ☐ |

5. In your present position, how important is your ABILITY TO WRITE the following kinds of communications? Please check only one box per line.

| | No Importance 1 | 2 | 3 | 4 | Very Important 5 |
|---|---|---|---|---|---|
| short memo (15-100 words) within CAI | | | | | |
| short memo (10-100 words) outside CAI | | | | | |
| long memo (101 wds. or more) within CAI | | | | | |
| logg memo (101 wds. or more) outside CAI | | | | | |
| short report (100-500 words) within CAI | | | | | |
| short report (100-500 words) outside CAI | | | | | |
| long report (501 words or more) within CAI | | | | | |
| long report (501 words or more) outside CAI | | | | | |
| drawing notes | | | | | |
| combination--writing/graphics | | | | | |
| letters that persuade | | | | | |
| letters that give information | | | | | |
| | 1 | 2 | 3 | 4 | 5 |

Other: specify and rate _____

6. Could you specifically describe the written and oral communication skills needed for a person to successfully perform at the following job levels in relation to your present position?

| | YES | NO |
|---|---|---|
| 1 job level upward | | |
| 2 job levels upward | | |
| 3 job levels upward | | |
| 1 job level downward | | |
| 2 job levels downward | | |
| 3 job levels downward | | |

7. In your present position, how important is YOUR ability to speak/discuss in the following ORAL COMMUNICATION situations? (Please check only one box per line).

| | No Importance 1 | 2 | 3 | 4 | Very Important 5 |
|---|---|---|---|---|---|
| person to person (within CAI) | | | | | |
| person to person (outside CAI) | | | | | |
| small group (3-7 people) within CAI | | | | | |
| small group (3-7 people) outside CAI | | | | | |
| large group (8 or more people) within CAI | | | | | |
| large group (8 or more people) outside CAI | | | | | |
| speech/presentation--within CAI | | | | | |
| speech presentation--outside CAI | | | | | |
| telephone conversation | | | | | |
| Other: (specify and rate) _____ | | | | | |

BE SURE THAT YOU HAVE READ AND UNDERSTAND THE DEFINITIONS ON PAGE 2 BEFORE YOU RESPOND TO QUESTIONS 8 and 9.

8. Using the definitions on page 2, rate the importance of your ability to be able to SEND the following kinds of messages within and outside CAI.

| | No Importance 1 | 2 | 3 | 4 | Very Important 5 |
|---|---|---|---|---|---|
| Information giving (within CAI) | | | | | |
| Information giving (outside CAI) | | | | | |
| Persuasive (within CAI) | | | | | |
| Persuasive (outside CAI) | | | | | |
| Task (within CAI) | | | | | |
| Task (outside CAI) | | | | | |
| Human (within CAI) | | | | | |
| Human (outside CAI) | | | | | |
| Maintenance (within CAI) | | | | | |

9. Using the definitions on page 2, rate the importance of your ability to be able to R E C E I V E the following kinds of messages.

| | No Importance 1 | 2 | 3 | 4 | Very Important 5 |
|---|---|---|---|---|---|
| Information receiving (from within CAI) | | | | | |
| Information receiving (from outside CAI) | | | | | |
| Persuasive (from within CAI) | | | | | |
| Persuasive (from outside CAI) | | | | | |
| Task (from within CAI) | | | | | |
| Task (from outside CAI) | | | | | |
| Human (from within CAI) | | | | | |
| Human (from outside CAI) | | | | | |
| Maintenance (from within CAI) | | | | | |

10. Do you think that increased communication could help you do your present job more effectively?

YES ☐ NO ☐

If yes, complete question 11; if no, you have finished Part I.

11. Which of the following communication channels should be used more frequently to help improve your job efficiency? You may check more than one box).

- increase communication FROM next level up- ☐
- increase communication FROM two levels up ☐
- increase communication FROM three or more levels up ☐
- increase communication FROM next level down ☐
- increase communication FROM two levels down ☐
- increase communication FROM three or more levels down ☐
- increase communication FROM same level ☐

- increase communication SENT to next level up ☐
- increase communication SENT to two levels up ☐
- increase communication SENT three or more levels up ☐
- increase communication SENT to next level down ☐
- increase communication SENT to two levels down ☐
- increase communication SENT to three or more levels down ☐
- increase communication SENT to same level ☐

PART II - - COMMUNICATION QUESTIONNAIRE

Part I of the questionnaire was designed to gather information about the importance of over-all communications. Part II is designed to gather information about how you perceive various writing skills. Part II begins our close look at employee writing skills. Part III will deal with verbal communication skills.

Please be sure to complete each item accurately. The accuracy of the results of the study depend on your continued cooperation. Your answers will, of course, be kept confidential with H. McKeown; the final report will give information in group averages only.

You may call me, Extension 2676, or visit my office on the first floor if you have questions.

Please complete Part II and return it to me within two days.

Thank you for your cooperation.

H. McKeown
Communication Consultant

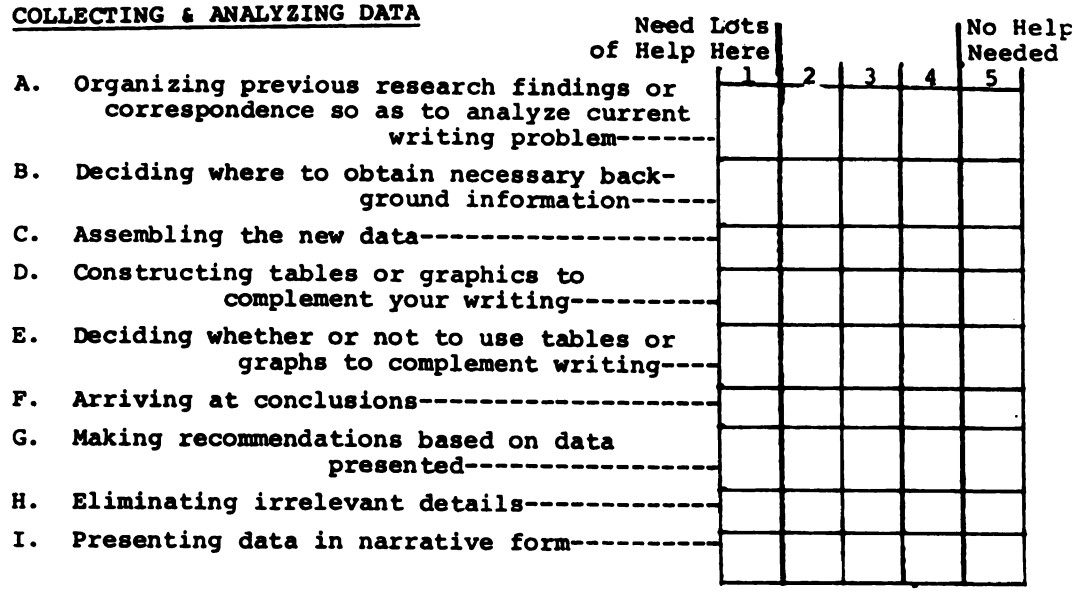
1. If you had to do each of the following as part of your present position, place an "X" in the box which best describes your ability to do each statement. The statements refer to letters, reports, memos, and other job related communications WHICH YOU WRITE. (Mark an "X" in only one box per statement).

| ORGANIZATION | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Organizing report contents into sections | | | | | |
| B. Planning different types of written comm. | | | | | |
| C. Self-discipline in getting started | | | | | |
| D. Getting time to write | | | | | |
| E. Meeting due dates for reports, letters, etc., | | | | | |
| F. Stating problem clearly, briefly; getting problem focused in my mind | | | | | |

| 2. WRITING STYLE OR QUALITY | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Writing briefly; writing concisely | | | | | |
| B. Writing good sentences (not dull or monotonous) | | | | | |
| C. Writing grammatically correct sentences | | | | | |
| D. Expression--word choice | | | | | |
| E. Writing clear sentences | | | | | |
| F. Fluency--able to turn out drafts quickly | | | | | |
| G. Sentence/paragraph unity (stick to one subject at a time) | | | | | |
| H. Sentence/paragraph coherence (ideas flow smoothly and logically from one to another | | | | | |
| I. Ability to identify various backgrounds of readers | | | | | |
| J. Ability to write for readers of varied backgrounds | | | | | |
| K. Making meaning clear | | | | | |
| L. Paragraph construction(logical organization) | | | | | |
| M. Using correct format(headings, side headings) | | | | | |

3.

**COLLECTING & ANALYZING DATA**



4.

If you had to do each of the following as part of your present position, place an "X" in the box which best describes your ability to do each statement. The statements refer to letters, reports, memos, and other job related communications WHICH YOU WRITE. (Mark an "X" in only one box per statement).

| CONTENT OR COVERAGE | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Deciding what information to include or exclude | | | | | |
| B. Determining what readers expect | | | | | |
| C. Satisfying superiors; getting communication through the "mill" | | | | | |
| D. Getting my point across without offending my reader | | | | | |
| E. Writing good introductions | | | | | |
| F. Writing summaries or abstracts | | | | | |
| G. Writing conclusions | | | | | |
| H. Writing recommendations in reports, etc. | | | | | |
| I. Explaining incomplete analysis or degree of accuracy in results | | | | | |
| J. Proper emphasis; able to distinguish important and unimportant details | | | | | |
| K. Consideration of reader's interests and needs | | | | | |
| L. Relating current writing to overall programs, projects, and objectives | | | | | |
| M. Deciding who to send message to | | | | | |

5. Place an "X" in the box which best describes YOUR ABILITY TO PREPARE AND DELIVER the communications listed even if you don't prepare them as a part of your present position. (Only one "X" per line).

| WRITTEN COMMUNICATION | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Short memo (15-100 words) | | | | | |
| B. Long memo 101 or more words) | | | | | |
| C. Short report (110-500 words) | | | | | |
| D. Long Report (501 or more words) | | | | | |
| E. Drawing notes | | | | | |
| F. Combination--writing/graphics | | | | | |
| G. Letters that persuade | | | | | |
| H. Letters that give information | | | | | |

6.

| ORAL COMMUNICATION | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. person-to-person (information giving) | | | | | |
| B. person-to-person (Persuasive) | | | | | |
| C. telephone conversation | | | | | |
| D. small group (3-7 people/I give information) | | | | | |
| E. small groups (3-7 people/I persuade people | | | | | |
| F. large groups (8 or more people/I give information) | | | | | |
| G. large groups (8 or more people/I persuade people) | | | | | |
| H. Speech/presentation (3 or more minutes/I give information) | | | | | |
| I. Speech/presentation (3 minutes or more/I persuade people) | | | | | |
| J. TASK MESSAGES | | | | | |
| K. MAINTENANCE MESSAGES | | | | | |
| L. HUMAN MESSAGES | | | | | |

PART III - - COMMUNICATION QUESTIONNAIRE

This is the last part of the three-part questionnaire. Parts I and II dealt with the over-all importance of communication and your written communication skills. Part III is designed to gather information about your oral communication skills and problems you encounter with messages which you receive. As before, your responses will be kept confidential.

For the oral communication part, you will be responding to the same five-point scale as you did on Part II. The scale will range from 1--"NEED Lots of Help Here" to 5--"No Help Needed." For the last two questions, the five-point scale will be designed to gather information about frequencies. The scale will be 1--"Seldom" to 5--"Frequently." Be sure to mark only one "X" per line.

Please make any general comments, suggestions, etc., which you would like to on the last page. You might relate your comments to communication skills, Career Development seminars or whatever. Perhaps there are some topics relating to communication which I did not cover in this study; please feel free to question or discuss those topics. You may use additional pages if needed.

As before, you may call me, Extension 2676, or visit me in my office. Please return the questionnaire within two days.

Thank you for your cooperation.

Henry S. McKeown
Communication Consultant

ALL OF THE STATEMENTS BELOW RELATE TO VERBAL COMMUNICATION.

1. Rate YOUR ABILITY TO DO each of the statements related to verbal communication <u>even if you don't use the skill as part of your present position</u>.

| VERBAL--ORGANIZATION | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Ability to plan different types of oral communications. (speeches, telephone, group presentations) | | | | | |
| B. Getting time to communicate orally | | | | | |
| C. Getting topics clearly focused in my mind | | | | | |
| D. Self discipline in getting started | | | | | |
| E. Dividing topic into sections | | | | | |

| DELIVERY | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Maintaining good tone of voice | | | | | |
| B. Speaking clearly (enunciation) | | | | | |
| C. Maintaining other's interest | | | | | |
| D. Making my meaning clear | | | | | |
| E. Emphasizing major ideas when presenting | | | | | |
| F. Speaking with people with varied backgrounds | | | | | |
| G. Expressing Ideas--word choice for particular audience | | | | | |
| H. Speaking too fast or too slow | | | | | |
| I. Using charts, graphs, etc., for emphasis | | | | | |
| J. Wandering to unrelated subjects | | | | | |
| K. Delivering introduction | | | | | |
| L. Delivering conclusion | | | | | |
| M. Delivering recommendations | | | | | |
| N. Delivering body of message | | | | | |

ALL OF THE STATEMENTS BELOW RELATE TO VERBAL COMMUNICATION.

2. Rate YOUR ABILITY TO DO each of the statements even if you don't use the skill as part of your present position.

| CONTENT or COVERAGE | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Deciding what to include or exclude | | | | | |
| B. Waste time with too much social talk before getting to point | | | | | |
| C. Difficulty analyzing audience/receiver | | | | | |
| D. Getting point across/not offending receiver | | | | | |
| E. Proper emhpasis; able to distinguish between important & unimportant details | | | | | |
| F. Gearing talk to listener's interest & needs | | | | | |
| G. Relating current communication to overall programs, projects or objectives | | | | | |
| H. Preparing introductions for oral communication | | | | | |
| I. Preparing conclusions for oral communication | | | | | |

| COLLECTING/PREPARING/ ANALYZING DATA | Need Lots of Help Here 1 | 2 | 3 | 4 | No Help Needed 5 |
|---|---|---|---|---|---|
| A. Deciding where to get background information | | | | | |
| B. Obtaining background information | | | | | |
| C. Deciding whether or not to use supporting graphics | | | | | |
| D. Making tables & graphs to complement oral comm. | | | | | |
| E. Interpreting Data | | | | | |
| F. Arriving at conclusions | | | | | |
| G. Arriving at recommendations | | | | | |

3. Which of the following problems do you encounter in the job related written and verbal communications which you RECEIVE from people in positions ABOVE you or on the SAME LEVEL. (Place an "X" in one box for each statement).

| | Seldom 1 | 2 | 3 | 4 | Frequently 5 |
|---|---|---|---|---|---|
| A. Poorly organized | | | | | |
| B. Inadequate vocabulary; lacks clarity | | | | | |
| C. Poor sentence structure; ideas confusing | | | | | |
| D. Lack of adequate, accurate technical data | | | | | |
| E. Poor grammar | | | | | |
| F. Lack of brevity or conciseness | | | | | |
| G. Sloppy typing, format, style, appearance | | | | | |
| H. Communication not getting out on time | | | | | |
| I. Data contain technical errors | | | | | |
| J. Not geared to receiver's needs or interests | | | | | |
| K. Ineffective introductory statements | | | | | |
| L. Ineffective concluding statements | | | | | |
| M. Main ideas not properly emphasized | | | | | |
| N. Writing/talking lacks unity (wanders from one idea to another) | | | | | |
| O. Writing/talking lacks coherence (ideas don't smoothly or logically flow from one to another) | | | | | |
| P. Inadequate support for conclusions | | | | | |
| Q. Inadequate support for recommendations | | | | | |
| R. Inadequate support for various paragraphs or sections | | | | | |
| S. Failure to relate current communication to overall programs, projects, or objectives | | | | | |
| T. Unneeded communication (not relevant to me or my project, objectives, etc.) | | | | | |

OTHER: (Specify & Rate) _____

_____

_____

4. Which of the following problems do you encounter in the job related written and verbal communications which you RECEIVE from people in positions BELOW you. (Place an "X" in one box for each statement).

| | Seldom 1 | 2 | 3 | 4 | Frequently 5 |
|---|---|---|---|---|---|
| A. Poorly organized | | | | | |
| B. Inadequate vocabulary; lacks clarity | | | | | |
| C. Poor sentence structure; ideas confusing | | | | | |
| D. Lack of adequate, accurate technical data | | | | | |
| E. Poor grammar | | | | | |
| F. Lack of brevity or conciseness | | | | | |
| G. Sloppy typing, format, style, appearance | | | | | |
| H. Communication not getting out on time | | | | | |
| I. Data contain technical errors | | | | | |
| J. Not geared to receiver's needs or interests | | | | | |
| K. Ineffective introductory statements | | | | | |
| L. Ineffective concluding statements | | | | | |
| M. Main ideas not properly emphasized | | | | | |
| N. Writing/talking lacks unity (wanders from one idea to another) | | | | | |
| O. Writing/talking lacks coherence (ideas don't smoothly or logically flow from one to another) | | | | | |
| P. Inadequate support for conclusions | | | | | |
| Q. Inadequate support for recommendations | | | | | |
| R. Inadequate support for various paragraphs or sections | | | | | |
| S. Failure to relate current communication to overall programs, projects, or objectives | | | | | |
| T. Unneeded communication (not relevant to me or my project, objectives, etc.) | | | | | |

OTHER: (Specify & Rate)_____

_____

_____

COMMENTS :

# APPENDIX D

## Introductory Memoranda

## and

## Outline of Presentation

# APPENDIX D

## Introductory Memoranda

12/30/74

TO:

FROM:

SUBJECT: COMMUNICATIONS CONSULTANT

Starting Mid-January, Mr. Henry McKeown, Associate Professor at Jackson Community College, will be conducting a study at . The purpose is to develop a communications profile of our organization. We expect the study to assist us in selecting future courses and seminars for our Career Development Programs.

Mr. McKeown is an Associate Professor of English at Jackson Community College and is nearing completion of his Ph.D. in Education at Michigan State University.

In the next few weeks, some of you may be asked to participate directly in the study or to have one or more of your subordinates participate.

Thank you for your continuing cooperation and assistance.

1/14/75

TO:

FROM:

SUBJECT: ORIENTATION MEETING FOR COMMUNICATIONS STUDY

DATE: Wednesday, January 15, 1975

TIME: 5 PM

PLACE: New auditorium (1D)

# APPENDIX D

## Outline of Presentation

### OUTLINE OF INFORMATION MEETING/PERSONAL CONFERENCES

I. Purposes of Project

   A. To identify the critical written and verbal communication skills needed by employees in various job levels

   B. To gain information that will be useful for making decisions related to the Career Development program

      1. communication profile of various job levels

      2. information base for selecting future courses and seminars for the Career Development Program

II. Design of Project

   A. Two-part study

      1. communication log

      2. follow-up questionnaire

   B. Purposes of Communication log

      1. to survey the frequency of job related written and verbal communication activity

      2. to survey the kinds of messages sent and received

      3. to survey the channels that are used

   C. Purposes of Follow-Up Questionnaire

      1. to determine the importance of various communication activity for each job level

      2. to survey the self-perceived abilities to plan and deliver different communications

III. Procedures

A. Communication Logs

1. review each category of log form

2. review mechanics of using log form

3. set dates for recording in logs

4. review examples of communication

B. Questionnaire

1. review general categories of items

2. review mechanics of completing and returning questionnaires

3. set tentative dates for completing questionnaire

C. Consultant's Role

1. give office location and telephone extension

2. encourage calls and visits if questions arise

IV. Conclusion

A. Review purposes of project

B. Stress importance of individual participation

C. Questions from participants

# APPENDIX E

## Memoranda--Log Recording

DIRECTIONS FOR KEEPING YOUR

C O M M U N I C A T I O N  L O G  (January 20-24)

1. Familiarize yourself with the categories and definitions. This will make it quicker for you to record communications during the week.

2. Keep the log with you at all times so that you can record communications as soon as possible after the situation. Don't wait until the end of the day and try to remember all of your communications.

3. Complete one column for each communication situation you experience during the week. Record only those communications which are related to your work--do not record personal, social conversations.

4. Record four message situations on each page of the log. After you record four messages, tear the sheet off and put it in the left-hand pocket of your folder until the end of each day. Be sure to complete the information at the top of the log page.

5. Don't forget to record names in categories 4 and 5 and the time in category 8.

6. At the end of each day, place all of your log pages for that day in the envelope provided and mail to me, Henry McKeown, Personnel.

7. At the end of the day on Friday, return the entire folder to me along with Friday's log pages.

8. If you have any questions, please call me on Ext. 2676 or visit me on the first floor, Section B, across from the personnel office.

THANK YOU FOR YOUR COOPERATION.

# APPENDIX E

## Memoranda-Log Recording

January 21, 1975

TO: COMMUNICATION SURVEY PARTICIPANTS

FROM: Henry McKeown, Communication Consultant

SUBJECT: COMMUNICATION LOGS

I have received most of your log sheets from the first day of recording; all of you seem to be doing a thorough job.

With three more days of the same conscientious effort, the survey will surely give us accurate information about your job-related communication activities.

Be sure to call me, Ext. 2676, if you have questions or need more forms

January 21, 1975

TO: COMMUNICATION SURVEY PARTICIPANTS

FROM: Henry McKeown, Communication Consultant

SUBJECT: COMMUNICATION LOGS

Please be sure to check Categories 2 and 3 on your log form. You need to have a check mark in at least one box in Category 2 AND in at least one box in Category 3.

Also, please be sure to put names in boxes for internal communications Categories 4 and 5.

TO: COMMUNICATION SURVEY PARTICIPANTS 1/23/75

FROM: Henry McKeown, Communication Consultant

SUBJECT: COMMUNICATION STUDY

If you have kept your communication log for five days by Friday, January 24, please return your folder to me along with Friday's log sheets. If you don't have five days, please carry over until next week.

A follow-up, confidential questionnaire will be sent to you soon. As soon as the information from the questionnaire and communication logs is analyzed, it will be communicated to you.

# APPENDIX F

## Memoranda--Introduction to Questionnaire

# APPENDIX F

## Memoranda--Introduction to Questionnaire

February 27, 1975

TO: All Communication Study Participants

FROM: J. J. Farr
Henry McKeown, Communication Consultant

SUBJECT: Communication Questionnaire

In a few days you will receive the first part of a three-part questionnaire. The questionnaire is designed to collect further details about the communication skills which you use to do your daily work.

Please be sure to complete each section of the questionnaire completely and carefully. The accuracy of the results will depend on your cooperation. The questionnaires are number coded, so your answers will be kept confidential between you and H. McKeown. The final data will be presented as group averages.

H. McKeown will be available in his office on the first floor. Please feel free to visit or call him (Ext. 2676) if you have questions.

# APPENDIX G

## Cover Memoranda--Part II of Questionnaire

# APPENDIX G

## Cover Memorandum-Part II of Questionnaire

March 11, 1975

TO: Communication Study Participants

FROM: Henry McKeown

SUBJECT: PART II OF QUESTIONNAIRE

There are "laws" that help explain events in any situation; the following is appropriate for an existing problem:

Murphy's First Law: If anything can possibly go wrong--it will.

First Corollary: When things are going well, something will go wrong.

Because of a clerical oversight, Part II of the questionnaire was mailed to you without a means for me to combine it with your Part I. Therefore, I ask your cooperation by completing Part II of the questionnaire again, and I apologize for the inconvience.

I realize that you are busy, but your careful attention to Part II for the second time would be appreciated. Please be sure to respond to all statements on the questionnaire.

Thank you for helping to solve this problem.