Communication in the Workplace: What Can NC State Students Expect?

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1. Introduction

The three courses provided by NC State University's Professional Writing Program (English 331, 332, and 333) focus on technical, business, and scientific communication. The faculty who teach in the program realize the need to gather information about communication tasks in the workplaces where their students will seek employment--including education, engineering, finance, management, marketing, programming, and research fields.

In 1996, 2001, 2006, 2012, and 2017, the Professional Writing faculty assigned their students to interview and conduct a survey of professionals in their various fields. Data were collected and analyzed, resulting in four published reports that have proven extremely useful for teaching and course planning. In the following sections of the introduction, we describe the following: the process of our research, the participants in the study, and key findings from our survey.

How did we do this study?

During the spring semester of 2017, students taking NC State's courses in technical, business, and scientific communication conducted a coordinated series of a structured survey and an informal interview with working professionals whom students identified as appropriate role models for their own careers. Although this was not a formally randomized survey, we aimed to ensure relevance of the information by asking students to interview someone with a job they would like to have in about five years. A copy of the survey and interview questions is included in Appendix A. This survey was revised substantially from the previous years' studies in order to focus on new genres, contexts, and technologies for professional writing. The questions

emphasize writing but also seek information about various forms of oral and global communication and the impact of technology on communication in the workplace.

Students wrote reports that have provided us not only with responses to the questions but also with accounts of their discussions, which often included interesting verbatim quotations from those interviewed. A total of 549 student reports were read and analyzed, which included professional comments and quotes. This introduction to the report presents the quantitative results from the survey, and upcoming sections present an analysis of the trends and implications of the qualitative discussions in student reports, organized in correspondence with stated learning outcomes for the professional writing courses at NC State.

Who responded to the survey?

1098 students interviewed professionals in their fields of study. We reduced our database to 839 survey participants, because some respondents identified their profession as "other," making it difficult to examine trends on the basis of profession. As a result, our survey results emerge from participants who identify their job titles as associated with the following professions:
- Education = 93 (11%)
- Engineering = 275 (33%)
- Finance, Accounting, and Banking = 123 (15%)
- Management = 91 (11%)
- Marketing and Sales = 104 (12%)
- Programming = 60 (7%)
- Research = 93 (11%)

This database is large enough for us to draw meaningful conclusions about the state of workplace communication in the current moment. Furthermore, while we did not focus on a comparative analysis, our prior reports offer us the opportunity to reflect on some similarities and differences in professional communication practices over a span of 20 years. The demographics of our study and the fields of the professionals who were interviewed have remained consistent over time. The majority of the professionals surveyed in this project work for organizations with more than 500 employees (58%), while 22% work for companies that employ fewer than 50 people. Just over 60 percent of our participants hold a B.A. or B.S. degree, while just over 18 percent hold a master's degree of some kind, and around 11 percent have a Ph.D, Ed.D, or M.D. degree. Over 60 percent of our participants completed a course in technical, business, or science writing to prepare them for their careers.

Summary of survey results

Overall, professionals perceive that the quality of their writing matters to the performance of their jobs, and 75 percent of professionals rated writing as extremely important or very important to job performance. Only one percent of participants reported that the quality of their writing was not at all important.

When we break down the responses further, we can see some variation across professions in how employees understand the importance of writing quality to everyday job performance. As Figure 1.1 illustrates, between 70 and 85 percent of participants from most fields surveyed indicated that writing quality was very important or extremely important to their jobs, with professionals from

the fields of management, finance, and research representing the three highest categories. The field of computer programming included the lowest percentage of participants who rated writing quality as extremely or very important to job performance, with 48 percent of participants choosing one of these two responses. Figure 1.2 shows that programming, by contrast, contained the largest percentage of professionals who ranked writing as moderately important, with 40 percent of participants who identified as programmers choosing this designation.
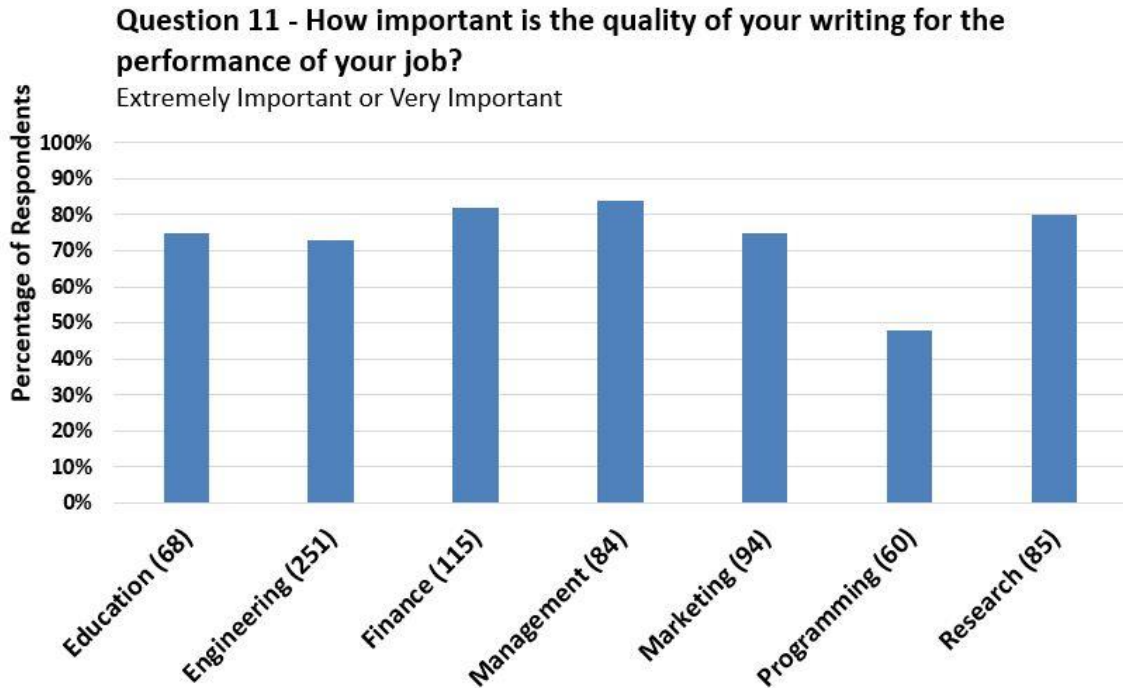

Figure 1.1. Percentage of participants across fields who ranked writing quality as extremely or very important.
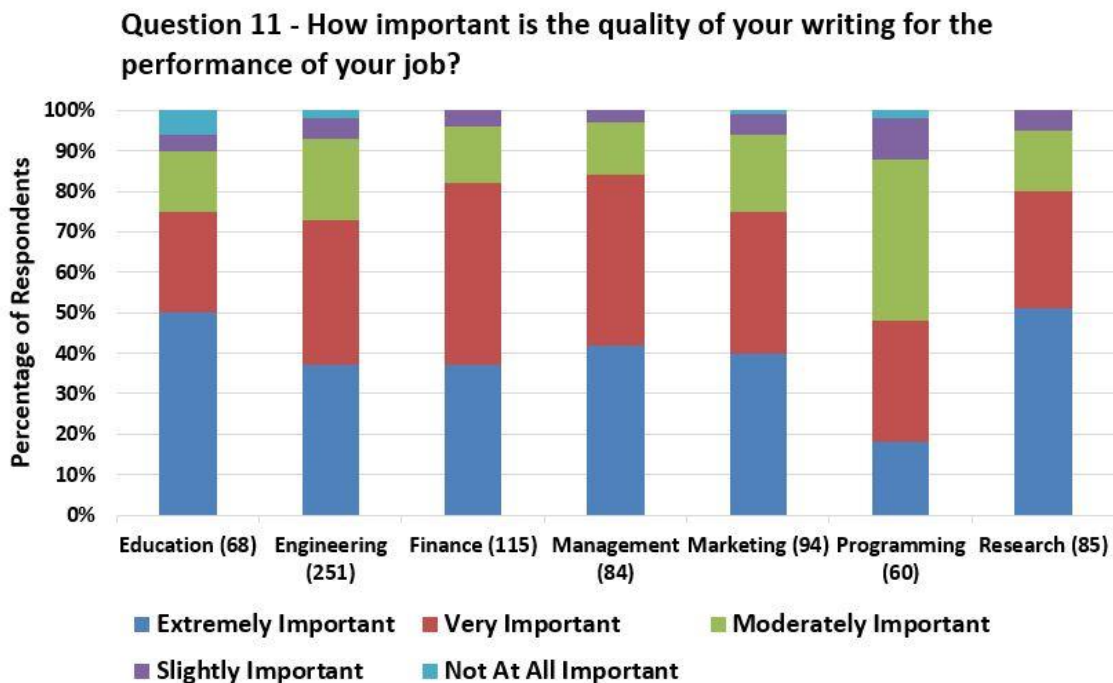
Figure 1.2. Percentage of participants who rated writing quality as extremely, very, moderately, slightly or not at all important across fields.

Consistent with findings from the past four iterations of this study, professionals also indicate that written communication remains important to career advancement. Effective communication is often assessed by managers as a factor for ongoing advancement and success. In fact, 83 percent reported that oral and written communication is a part of their performance appraisals, and 70 percent responded that written communication is either extremely important or very important to their career advancement.

Again, it is possible to see some variation across the role of writing in possibilities for career advancement. To take two professions as examples, Figure 1.3 illustrates that more than 50 percent of researchers reported that writing is extremely important for their career advancement, whereas engineers were more likely to rank writing as very important (42 percent), as shown in Figure 1.4.
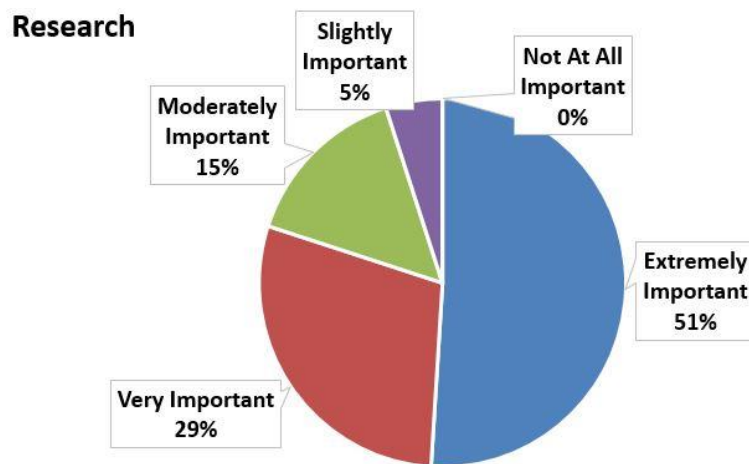
Research

Slightly Important 5%
Not At All Important 0%
Moderately Important 15%
Extremely Important 51%
Very Important 29%

Figure 1.3. The importance of writing for career advancement for surveyed researchers.

Engineering

Slightly Important 5%
Not At All Important 2%
Moderately Important 20%
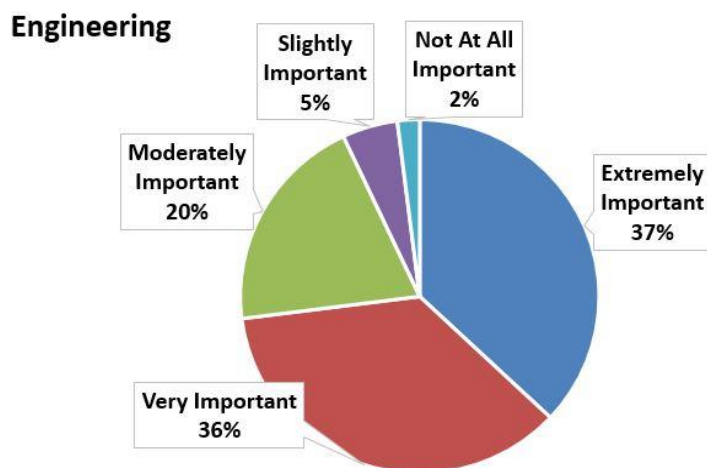Extremely Important 37%
Very Important 36%

Figure 1.4. The importance of writing for career advancement for surveyed engineers.

In addition to reflecting on the importance of communication and writing for everyday work and advancement, our participants also reflected on how much time they spend writing. We asked participants to try to account for the percentage of their total work week that they spend writing. Although our participants offered a range of responses, we averaged the percentage provided by respondents across each profession. As reflected in Figure 1.5, the average percentage reported across professions ranged from a high of 42 percent of time for marketing professionals to 26 percent of time for programmers. Average responses for the remaining professions varied between 30 and 40 percent of the total work week spent writing.

Percentage Time Spent Writing
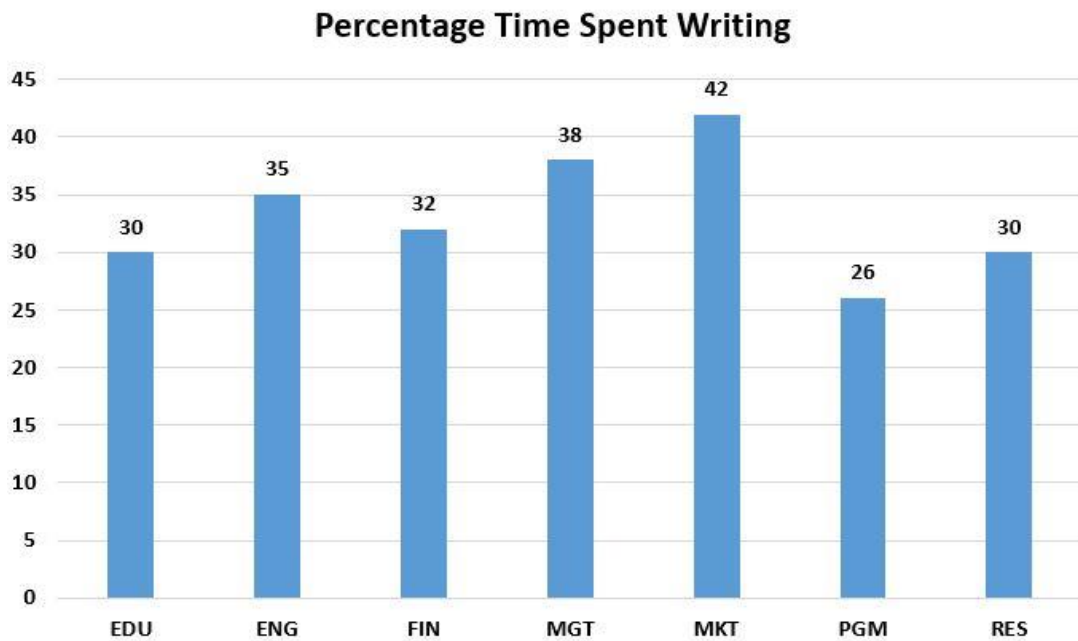
Figure 1.5. Percentage of the total work week participants spend writing across professions.

To better understand this time use, we also asked participants to reflect on their time spent collaborating, specifically what percentage of their total work week they devoted to planning and writing documents with others. Again, we found that participants perceive themselves to spend a meaningful amount of time during their work week writing collaboratively. As Figure 1.6 indicates, the average percentage for each group ranged from a high of 24 percent, for managers, to a low of 12 percent, for programmers. The average percentage of time use for collaboration across all groups was just over 18 percent of their total work week.

Percentage Time Spent Collaborative Writing

EDU: 15, ENG: 19, FIN: 17, MGT: 24, MKT: 23, PGM: 12, RES: 19
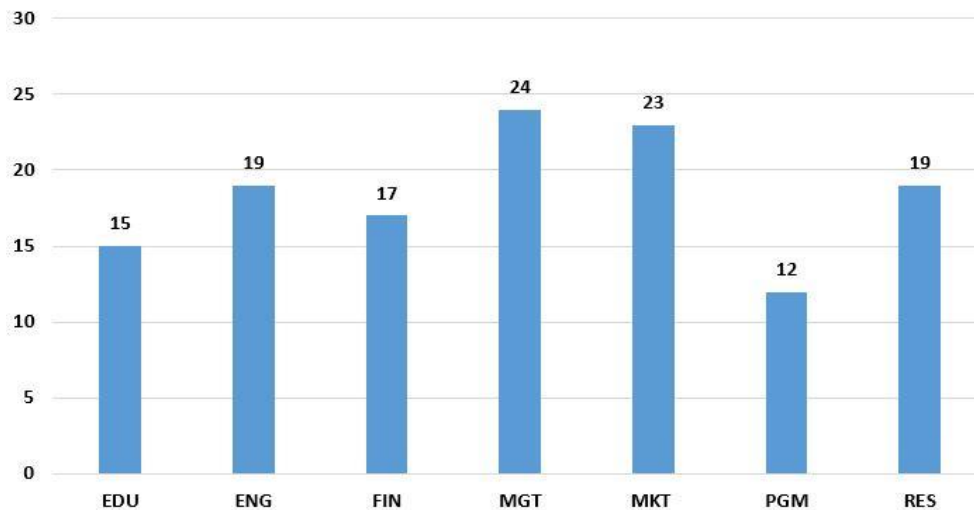
Figure 1.6. Percentage of the total work week spent planning or writing documents with others, by profession.

With the expansion of global industry, we were interested to learn about whether our participants found themselves communicating internationally and, if so, how often. While a meaningful portion of our participants do not communicate at all internationally, the average percentage of a total work week spent communicating internationally was almost 13 percent (12.85 percent). As Figure 1.7 demonstrates, programmers ranked highest across professions for global communication, with 18 percent of the work week spent communicating across national borders. Educators were the least likely group of participants to find themselves communicating globally.

Percentage Time Communicating Internationally

EDU: 8, ENG: 14, FIN: 9, MGT: 16, MKT: 11, PGM: 18, RES: 14
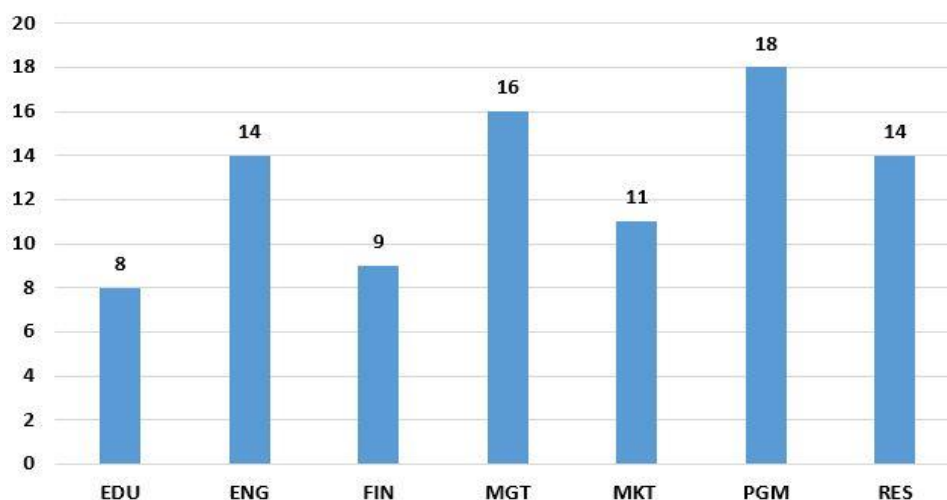
Figure 1.7. Percentage of the total work week spent communicating internationally by profession.

Next, we asked professionals to tell us more about the kind of writing they do and for whom. We were interested in traditional professional communication formats, such as memos, letters, and proposals, as well as in how new technologies and media platforms may be shaping the kinds of professional documents that circulate in workplace contexts. As a result, we asked participants to reflect on their use of emails, social media, chat/IM/text messages, short internal word-processed documents, short external word-processed documents, and long word-processed documents for their supervisors, coworkers, clients or customers, and other stakeholders.

Tables 1.1, 1.2, and 1.3 begin by providing information about what we might understand to be some of the more standard and emerging forms of workplace communication used by professionals. These tables indicate when our participants understood these document types to be a preferred (Table 1.1), acceptable (Table 1.2), or unused (Table 1.3) form of communication for key audiences for professional communication. As Table 1.1 indicates, email is an overwhelmingly preferred medium of communication for professional writers across the many different kinds of audiences they address with their written communication. None of the other document types listed come close to the preference for email as a way to communicate through writing with supervisors (71 percent), coworkers (67 percent), clients or customers (66 percent), and other stakeholders (51 percent). Also noteworthy in preferred document types was the emerging importance of chat, IM, and text messages among coworkers, with 26 percent of respondents ranking this as a preferred medium. This ranked it ahead of every other category besides email. For communication to clients or customers and other stakeholders, we can see that long written genres, such as reports and proposals, remain important. These documents occupied a similar position (25 percent for clients or customers and 21 percent for other stakeholders) as chat/IM/text messages to coworkers, indicating the continued need to understand and produce formal workplace writing genres.

When we move to the written communication types found acceptable for workplace communication, we see a much broader spectrum of writing types emerge as useful. Again, the fast-paced communication that takes place in chat, IM, and text messaging was understood to be an acceptable form of communication to supervisors and coworkers by well over half of participants (59 percent and 60 percent respectively), but those percentages drop off considerably for external audiences such as clients, customers, and other stakeholders. When we analyze the forms of communication not used, we find that most of our participants have not yet incorporated social media into workplace communication.

Table 1.1. Written communication preferred

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Email	71%	67%	66%	51%
Social Media	2%	3%	4%	2%
Chat/IM/Text messages	13%	26%	6%	3%
Short internal docs (memos)	21%	18%	14%	12%
Short external docs (letters)	12%	10%	20%	13%
Long docs (reports, proposals)	25%	14%	25%	21%

Table 1.2. Written communication acceptable

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Email	25%	31%	24%	24%
Social Media	9%	23%	17%	12%
Chat/IM/Text messages	59%	60%	32%	25%
Short internal docs (memos)	53%	57%	41%	35%
Short external docs (letters)	44%	45%	50%	41%
Long docs (reports, proposals)	51%	56%	45%	39%

Table 1.3. Written communication not used

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Email	4%	2%	10%	26%
Social Media	90%	74%	79%	87%
Chat/IM/Text messages	28%	14%	63%	72%
Short internal docs (memos)	26%	25%	45%	54%
Short external docs (letters)	45%	45%	30%	46%
Long docs (reports, proposals)	25%	31%	30%	41%

We asked professionals a similar set of questions about the communicative media they were likely to use when speaking with their supervisors, coworkers, clients or customers, or other stakeholders. Again, we were interested in how traditional professional-communication formats, such as phone calls or face-to-face talk, compare with newer technologies, such as video conferencing. As a result, we asked participants to reflect on their use of in-person communication, the phone, and teleconferencing for supervisors, coworkers, clients or customers, and other stakeholders.

Table 1.4 shows that our participants most prefer speaking in person with all audiences, but particularly with their supervisors and colleagues. Right around half of participants found the phone or teleconferencing to be acceptable forms of oral communication with clients and customers (57 percent) or with other stakeholders (51 percent). Furthermore, we see that a sizable percentage of our respondents have not yet integrated teleconferencing software into their oral communication repertoires, although many find it to be an acceptable medium for talking with supervisors (57 percent), coworkers (58 percent), clients or customers (51 percent), or other stakeholders (41 percent).

Table 1.4. Oral Communication Preferred

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
In Person	76%	81%	53%	38%
Phone	21%	23%	33%	21%
Teleconference	16%	16%	18%	15%

Table 1.5. Oral Communication Acceptable

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders

In Person	20%	18%	34%	34%
Phone	71%	74%	57%	51%
Teleconference	57%	58%	51%	47%

Table 1.6. Oral Communication Not Used

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
In Person	4%	1%	13%	29%
Phone	8%	4%	10%	29%
Teleconference	27%	27%	31%	38%

Finally, we asked participants to tell us more about the technological devices that they used for their communication at work. Again, we asked participants to think through this issue by considering the percentage of their total work week that they spend communicating with each of the following devices: desktop computers, laptop computers, tablets, phone, and other handheld devices. As Figure 8, illustrates, 12 percent of participants across professions use laptop computers for between 91 and 100 percent of their work week. Also noteworthy was that 44 percent of participants rarely or never use desktop computers, with 44 percent choosing between 0 and 5 percent of their workweek spent on these devices. We understand this prevalence of laptop use as a likely continuation of a trend in personal computing toward greater mobility and situated uses of texts across different contexts.

While professionals are likely using phones for speaking, we also understand the small but persistent use of phones for communication as another step in the direction of the miniaturization of writing interfaces. Our results suggest much variation in the amount of time spent using both laptops and phones, with participants choosing percentages that range the entire spectrum of possibilities. Tablets and other handheld devices were relatively rare for participants in our study, with 78 percent of participants reporting that they use tablets between 0 and 5 percent of the time and 84 percent of participants using other handhelds for this percentage of time. However, this does mean that handheld devices are incorporated into the workday for many professionals, even if not as the pervasive device used for reading and writing text. We understand these trends toward smaller and more mobile devices as meaningful from a text-design standpoint (i.e., how do you make a document that is readable on a phone?) and also from a text creation standpoint (how do you input text on a phone?).

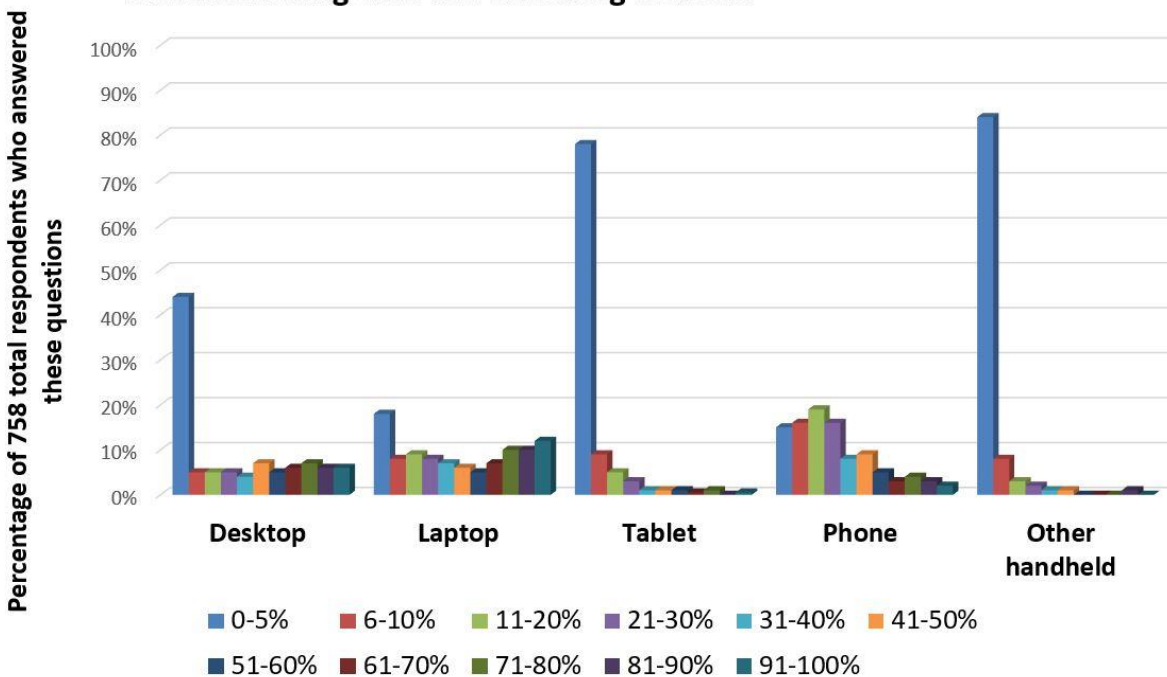**Question 20 : What percentage of your work week do you spend communicating with the following devices?**

Figure 1.8. Percentage of participants who use each device for workplace communication.

Additional Report Sections

In order to make the information we gained through our survey most useful for instructors and curricular designers, the following sections of the report trace qualitative themes and patterns through the lens of the learning outcomes for our Professional Writing Program:

- **Section 2: Audiences, Purposes, and Obligations for Writers** concerns student learning outcome #1[1], about audiences and purposes of writing, and student learning outcome #9[2], about ethical and other obligations in workplace communication.
- **Section 3: Reflective & Critical Uses of Conventions, Arguments, and Genres** concerns student learning outcomes #2[3] and #8[4], about effective and conventional argumentation, and student learning outcome #10[5], about locating and using context-appropriate information.

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[1] Students will be able to write documents that address purposes, audiences, and conventions of professional contexts

[2] Students will be able to describe ethical implications of communication situations in professional contexts.

[3] Students will be able to recognize and construct effective arguments for a variety of audiences and to adapt these to the formats and conventions of professional documents and genres.

[4] Students will be able to analyze and justify the persuasive strategies and professional conventions they use in their own writing.

[5] Students will be able to locate, analyze, and use information appropriate for selected professional documents and communication tasks.

- **Section 4: Application of Principles of Document Design and Visual Elements** concerns student learning outcome #3[6], about the principles of document design and visual communication.
- **Section 5: Application of Principles of Effective Oral Communication and Creation of Professional Presentations** concerns student learning outcome #4[7], about constructing oral presentations.
- **Section 6: Effective Communication through the Use of Electronic Media** concerns student learning outcome #5[8], about the context-appropriate uses of electronic media.
- **Section 7: Supporting Individual and Collaborative Work through All Stages of the Writing Process: Research/Planning, to Publication/Final Delivery** concerns student learning outcome #6[9], about the stages of the writing process, and student learning outcome #7[10], about the importance of collaboration.

Scenarios

The scenarios included throughout this report are elaborations of key themes that emerged from our analysis of the survey and interview data. Scenarios correspond with the Professional Writing Program's student learning outcomes that are used to organize this report, and they are intended to promote critical reflection as well as actual written and spoken responses.

For each scenario, we have applied the theme to a realistic context in which a person makes communication decisions. Faculty are encouraged to use the scenarios to generate discussions about rhetorical decision-making or in writing assignments that address tensions and exigencies.

The scenarios follow the main sections that we describe above. Here is a list for quick reference:
- Communicating with International Audiences
- Writing and Thinking with Genres
- Applying Document Design Collaboratively
- Speaking at Work
- Writing with Electronic Media
- Collaborating at Work

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[6] Students will be able to apply principles of document design and incorporate visual elements in order to meet the needs of different professional audiences.

[7] Students will be able to construct presentations appropriate for professional audiences and to apply the principles of effective oral communication.

[8] Students will be able to communicate effectively using electronic media appropriate to their professional fields.

[9] Students will be able to participate effectively in the writing process by planning, drafting, reviewing, revising, and critiquing professional documents.

[10] Students will be able to collaborate effectively in teams to create, review, and revise documents.

2. Audiences, Purposes, and Obligations for Writers

Audiences

The data reveal that people across engineering, business, and science fields are communicating with a variety of audiences that are both internal to the workplace and external to it.

Internal Audiences

Internal audiences are people with whom a person has a work relationship. Often these audiences share similar backgrounds and training that one can rely upon to facilitate interaction. The most common internal audiences are:

- Coworkers / Peers
- Supervisors / Administrators
- Executives / Upper Management
- Employees

Among these, the category of coworker and peers is the most diverse. It includes immediate coworkers, who might share the same position (e.g., field engineer), but it might also be coworkers in other departments of an organization (e.g., testing and quality assurance, design, human resources, marketing, and legal). Often these relationships are task based and successful communication depends on knowing what kind of content these audiences need and the form that they need it in.

Further up the administrative chain, people prepared documents or presentations for review by their immediate supervisors or for executives and upper management, further up the line. Respondents noted the importance of communicating with impeccable style, complete accuracy, and appropriate efficiency.

External Audiences

External audiences are those outside of the workplace, and they are less likely to share the same background, training, or professional concerns. Respondents noted the need to take more care ensuring that these audiences understood what was communicated to them. Common external audiences included:

- Clients / Customers
- Users
- Funding and Auditing Agencies
- Vendors
- Subcontractors
- Public

The most diverse group is the users, which includes any person who reads or listens to communication with the aim of doing something with that information. Users could be users of a technology, readers of a scientific article, students in a classroom, or patients in a medical clinic. Often, the person communicating with a user audience makes information accessible and helps the user understand or intuit how to use that information.

The same kind of motivations shaped interactions with clients and customers. When writing to funding and auditing agencies, such as those that approve research funding or that oversee product development, survey respondents noted a need to both convey information in an accessible way but also to follow particular formats and guidelines.

Communication with vendors and subcontractors was similar in style to communication with coworkers except that respondents noted more of a need to convey information without the assumption of shared background.

In some professions more than others, communication with a general public audience is an everyday activity, and several respondents made it clear that effective communication skills are essential in these cases. For example, one respondent explained, "I have to be able to communicate complex topics effectively to patients, parents, nurses, pharmacy staff members, administrators, and physicians" (ENG 333). The consequence of poor communication with the public can mean furthering the divide between public and professional sectors, at least creating misunderstanding if not potentially mistrust as well (ENG 331).

International Communication
One audience-related theme that emerged strongly in the interview data is that professionals across fields are, more than in years past, responsible for communicating with audiences from different world cultures.

One explanation for the increased attention to international communication is the growing internationalization of the communities in which professionals live and work. As one respondent noted: "[t]here are many different people from many different cultures moving into the area so it is becoming increasingly important to be able to communicate across cultures" (ENG 333).

Hastened by widespread adoption of and improvements in networking and communication technologies, many organizations have international reach and influence. Very likely, professionals will come into contact with people from different cultures in some aspect of their work. For example, one respondent noted that "[a]gents in our office communicate with people who are from different countries and English is often their second language" (ENG 332). Even in situations where everyone speaks a common language (e.g., English is the international language of science), there are still cultural differences to be respected: "[i]t is very important to be able to communicate to people of a different culture in this job" (ENG 331). If professionals are attuned to the differences and respectful of them, then that knowledge cannot help but influence the ways that they communicate: "[u]nderstand[ing] cultural norms is very important to understand[ing] the context in which you communicate" (ENG 331).

In this international context, oral communication plays uniquely important role. In a practical sense, oral communication is a mode that helps mitigate the consequences of miscommunication that may be amplified by over reliance on written communication. Conversing with another person in real time is like face to face conversation, allowing more opportunities to repair miscommunication as it happens. Oral exchanges also create opportunities for people to make a personal connection, which can further reduce uncertain and miscommunication: "[w]hen speaking to people of different cultures or backgrounds, it is so important to establish a common

ground as a person and not so much as a scientist. It is vital to find a connection and engage in regular conversation before stepping into the academic realm. I prefer face-to-face contact as well - it is so much easier to convey emotion that way" (ENG 333).

Another outcome of globalization is that major employers are becoming transnational corporations, with offices all over the world. While a design engineer, a chemist, or an account manager might not come face to face with international clients and customers, they may very well collaborate with their international counterparts in other offices. We see this kind of internationalization of the workforce in a number of different sectors, but technology and engineering most prominently:
- "[T]echnology now allows global team[s] to communicate and operate much more efficiently, creating very productive work forces, faster decision making and a much more flexible working environment" (ENG 331).
- "I work with people all over the world all the time. We're in 15 to 20 countries" (ENG 331).
- "A lot of software development in happens in India. Knowing how to say or phrase things to Indian teams in a technical way is important in order to make sure they understand the task at hand" (ENG 331).

In recognizing the diversification of our audiences, both professionally and culturally, professionals must critically assess the choices that they make in their communication. One respondent summarizes the issues well: "[i]t is important to be aware that cultural differences can be significant when attempting to communicate clearly. When having conversations with individuals from other countries or cultures, there can be uncertainty as to the other person's intent or expectations. I find that it is usually best to follow up with a written communication (email or letter) to ensure that I communicate my understanding of our discussion and allow them to correct any mistakes that I may have regarding their intent or expectations" (ENG 333).

Purposes

The purposes reported by respondents are as varied as the audiences, but they can be broadly classified as ways of accommodating audiences that use what is communicated to them. Respondents are communicating with audiences that are attempting to learn, to do, and to learn to do (Redish, 1989):

Communicating to Support Learning
One subset of purposes is those where the intent is to support an audience that is attempting to learn something specific or to deepen their knowledge of a topic. Examples include:
- Describing or explaining products and processes
- Communicating policies and requirements
- Reviewing (personnel) performance
- Evaluating performance (self)
- Reporting progress (e.g., on engineering goals)

Also included in this list are day-to-day purposes that people routinely accomplish with letters, memos and emails for recommending, referring, inviting, and celebrating. What these purposes tend to have in common is that they are detailed, focused, and comprehensive. Communicators

need to understand what questions of knowledge need to be answered in these documents and then provide answers in enough appropriate detail. Questions of knowledge might include "What are the features of a this product" or "What is the policy on this issue" or "Why has a product been designed in this way." What counts as enough and appropriate detail is guided by the communicator's awareness of audience and context.

In some cases, an audience's purpose might be to learn more about the communicator. Delivering progress reports, presenting information (orally), and providing self evaluations are critical forms of communication that may support personnel decisions. As one respondent summarized: "If you cannot write well about the project you are supporting or about the accomplishments that you have achieved in your current position, then it will be difficult for managers to assess your work and promotions" (ENG 331).

Communicating to Support Doing
A second subset of purposes is those in which the intent is to accommodate an audience that is attempting to accomplish some task with the information communicated. Examples include:
- Writing procedures (e.g., standard operating procedures, user manuals)
- Coordinating work flow (e.g., change requests, delegation, texting for meetings)
- Collaborating and directing meetings
- Designing studies or tests

What these purposes have in common is that they are action-oriented, direct, and brief. Often the organization of such communication is sensitive to both the order in which information will be used, where it will be used, and what kind of feedback users of that information require. Another way of putting this point is that a significant amount of professional writing is task-oriented: it is intended to assist audiences in applying that information and using it to coordinate their work with others.

Communication that supports doing solves problems of action. Communicators provide the information that readers or listeners need to get something done. They answer questions such as "How do I accomplish this task" or "What is the next step in this process" or "How do I get someone to do something."

A significant portion of the professional communication that people report doing is for the purpose of coordinating work flow: how people in an organization interact and get work done:
- "One of the benefits of good communication is that everyone understands what is needed and going on within the project. [...] If you communicate so that everyone understands the tasks, timeline, and resources then you are helping yourself stay on schedule and meet[ing] project timelines" (ENG 332)
- "People read my writing to keep up on how a project is going, to understand the process flow, and for record keeping" (ENG 331)
- "People read what I write to ensure that we stick to a certain level of cohesion within the company and the development of products for clients. It affects the decisions and actions of everyone involved in creating a product. These documents help build a sense of vision, direction, and purpose" (ENG 331)

As these respondents make clear, the purpose of communicating to support doing is grounded in the understanding that the audience's purpose is not simply to receive the communication but to do something with it and success in that purpose is measured in terms of efficiency, effectiveness, concision, precision and the cohesion that results.

Communicating to Supporting Learning and Doing

Finally, there is a group of purposes that can be described as supporting audiences who are attempting to learn to do. The purposes here are similar to those for communicating to learn and communicating to do. Audiences want to learn about a focused topic or issue with the aim of taking some kind of action based on what they learn. Examples include:

- Outlining and planning (e.g., a study, test cases, project plans)
- Reporting data
- Presenting an analysis
- Proposing and persuading
- Training

This kind of communication tends to be action-oriented, conceptually-rich, and more expansive than communication supporting "doing" audiences. Audiences that want to learn and do need background information. They need concepts explained and issues laid out in order to take informed action and to develop a model that might be applied across similar situations.

The purposes reported in this study confirm a truism about professional communication, which is that it often supports decision making (Rude, 1995). For example: "Upper management may read my writings to make decisions as to whether to fund projects as well as to get updates on the projects that were funded" (ENG 331). The obligation for communicators is to understand both what the questions of knowledge are (i.e., what does the reader/listener need to understand) and what the associated questions of action are (i.e., what does the reader/listener need to do with this information)? Effective communication is that which focuses on the appropriate details and presents them in a form that supports understanding and decision making.

Obligations

This combination of audiences and purposes translates into a number of obligations that shape how professionals communicate with others. Three obligations in particular summarize some of the most important trends: writing efficiently and effectively, writing with task orientation, and understanding the affordances of writing and speech.

Write Efficiently and Effectively

The most dominant theme appearing in the interview data was that communicators have the obligation to write efficiently and effectively. As one respondent aptly summarized: "I stress to my students the importance of being both CONcise and PREcise" (ENG 333). While these qualities are cornerstones of writing efficiently and effectively, they do not necessarily mean that communication is brief, lacking in description, or devoid of detail. Sometimes, being effective and efficient is a balancing act:

- "Effective, clear, and intuitive writing is essential for the right message in coming out, and driving the correct behaviors" (ENG 332)
- "Communicate complex jargon, keeping audience in mind, being able to communicate in proper lay terms" (ENG 331)
- "People are trying to get product out on time, get projects done quickly, and need answers now. They don't want to and don't have time to read paragraphs of text when one or two sentences will do" (ENG 332).
- "Ineffective writing [...] cost[s] the company thousands of dollars and multiple projects. Since every department in the company depends on a different group, one mistake in a report or business plan can lead to misunderstanding between the manufacturers and delay the distribution of the parts that are being built" (ENG 331)
- "The benefits to effective writing within our organization [is that it] allows the reader to quickly understand the information being conveyed and act on it without needing clarification" (ENG 332)

What these quotes suggest is that "efficient" and "effective" are interpreted in light of the circumstances. For example, the most concise and precise way to write about a consumer product might be to use engineering terminology to explain what the product is designed to do. This is efficient but maybe not effective when speaking to other users. Conversely, describing the functioning of the consumer product in great detail, covering all possible use scenarios might be effective but it may not be the most efficient way to communicate. On the other hand, communicating research findings using common terms and great detail might be appropriate for a general audience, but to an audience of scientific peers that kind of choice may seem neither efficient nor effective.

Another part of effective and efficient writing is perception. How a person's work group or entire organization may be seen by other groups, clients, or customers will be interpreted through the prism of the communication they create. When one communicates effectively and efficiently, it is far easier to create a positive impression.

Write with Task Orientation
Task orientation is a quality of written and spoken communication in which a communicator's choices about content and design are made in light of the tasks supported by that communication. Communicators need to know who their audiences are and what they expect to do with the information communicated to them in order to provide that information in a usable format and with the appropriate kinds and amount of detail.

Task orientation is often associated with written documents that are used by customers or by employees within an organization. When the communication is not task oriented, users can become frustrated about the apparent lack of fit to their circumstances; they may resent how their time is wasted attempting to discover if the information is of value or how to apply it: "[i]neffective writing wastes time and money. If you write poorly, it reflects poorly on you. Writing effectively allows you and your coworkers to get the job done quickly and correctly the first time" (ENG 331). In some occupations the consequences are more dire: "[p]oorly written procedures and policies can result in other employees being hurt or seriously injured. It is

extremely important for my documents to be clear and organized to prohibit any such event from occurring" (ENG 331).

Communication that lacks task orientation appears to readers and listeners as ineffective, and very real consequences follow: "[i]neffective proposals do not get funded. Ineffective letters do not result in people getting jobs, or nominated for awards, or looked on favorably for funding. Ineffective presentations do not convey a clear message or get the desired results. The inability to communicate effectively has great negative consequences. The flip side of this is that the ability to communicate well has great positive consequences" (ENG 333).

Understand the Affordances of Writing and Speech

Communicators must also have some awareness of the affordances of different communication media. Briefly, an affordance is a perceived quality of some object that makes a task or a relationship easier, such as in the way that a phone affords long distance communication better than yelling. Two obligations related to affordances show up in the interview data: choosing the right medium for communication and understanding the effect of those media on the permanence and mobility of one's communication.

Choosing a Medium

Many interviewees noted that one lesson they wished people would learn when entering the workplace is that one needs to choose a medium of communication based on knowing the following: who is the recipient, what is the content of the message, what relationships one is trying to build, and what cultural boundaries one is communicating across.

While communicators have a wide range of media to choose from, it is important to recognize that there may be times when writing an email or sending a text might seem like the most expedient means of communication but is not the most appropriate. Depending on the person, the sensitivity of the information, the potential for misunderstanding, or the importance of tone, it may be better to choose face to face or phone as a means of communication. Sometimes looking at a person face to face can make a difference in conveying trust and recognizing and addressing any confusion that might arise. Or choosing a presentation over a document might be the most effective way to broadcast information and put recipients into conversation with each other. At other times, text might be the right medium for setting down, in a more permanent form, what has been decided and agreed upon.

Understanding Media Effects

Related to choosing a medium for communication, it is necessary for communicator to understand the effects of one's media choices. A quality of speech and oral communication is its immediacy and the ability of communicators to see the reception of their words register on the listener's face. Information communicated by speech or agreements reached in speech have a degree of flexibility associated with them as well. People may not remember exactly what was said but do understand the gist of the idea. Normally, this flexibility allows people to apply information more readily to their circumstances of use, but that flexibility can also be a liability that one can avoid by choosing writing. "All of the final end products are written, and any oral communication preceding that is valuable, but what is written holds the most weight in the end and what will be evaluated" (ENG 332). Moreover, written communication is important

"because once it is in black and white there is no grey area for misunderstanding which is very important" (ENG 333). Understanding that written communication has a permanence to it can be both a help and a hindrance, but it is the communicator's responsibility to know when to make those trade-offs.

Scenario: Communicating with International Audiences

Amelia is a software designer working for a large, multinational organization with different divisions in charge of software and hardware design, testing and quality assurance, and user documentation. The team that she works with consists of other software designers in her office in Raleigh but the larger effort on this project includes work by other teams of designers at offices in Toronto and Seoul.

Each team is responsible for different parts of the overall software project but they are all working from a common set of engineering goals and outcomes that they revisit at regular team meetings. In Raleigh, Amelia coordinates work with her colleagues. They exchange emails and help each other with troubleshooting. The Raleigh team coordinates regularly with the Toronto office because they are in the same time zone and keep similar working hours. As needed, the two teams connect on video conference to coordinate their work efforts. The real-time exchange of the video conference allows the two groups to sort through any issues that need discussion.

Each night, before Amelia signs off for the day, she prepares a hand-off to her colleagues in the Seoul office. These hand off documents bring the Seoul team up to date on any changes to the project and about the progress that the Raleigh team has made on engineering goals as well as any discussions with the Toronto office. While all of the members of the Seoul team speak English, it is a second language, so Amelia must make sure that the has conveyed her progress and any issues as clearly as she can and in a format that readily allows her overseas colleagues to pick up the project where she left off and move it forward while she sleeps. In the morning, she receives a hand-off from the Seoul team and the process repeats itself.

3. Reflective and Critical Uses of Conventions, Arguments & Genres

The interview data clearly reveal that, with experience, people gain awareness of the decisions that they make as communicators. And given the chance to reflect on those decisions, the respondents discussed a range of issues that influence how they select content to communicate and in what form. This critical reflection showed clear awareness of how the choice of content and delivery was shaped by how communicators wanted to present themselves and to build or maintain relationships with their audiences.

This section will review some of the decisions that communicators make about content and delivery, paying particular attention to the focal points of critical reflection. By focal points, we mean issues that prompt communicators to stop and explicitly consider what steps to take in order to write or speak effectively. What do professional communicators consider and negotiate as they make decisions about how to be effective communicators? When they critically reflect on a given writing situation, what must they consider in order to make effective choices?

Focal Point 1: The Available Means of Communication

Scholarship in technical and professional communication and rhetoric has long emphasized how writers in any given context must weigh which document types or genres, media, and communication platforms or technologies are best suited to a given situation. We know that professionals choose certain forms of communication and different types of documents to fulfill specific tasks and achieve various outcomes. In line with this scholarship, we see participants reflecting on what platforms, genres, and technologies are best suited to their given purpose.

Within different genres and media, research has revealed that different conventions are used to meet varying purposes that can be fixed, changing, and persuasive (Bazerman, 1988). Writers must understand these conventions and make challenging decisions as they choose between writing short or long documents, sending emails or text messages, or collaborating to accomplish long term goals and purposes.

Genres

As professionals choose conventions to use for various purposes in their communication, they have choices to make about genre. Genre is linked to norms, values, and ideology, and "Understanding the genres of written communication in one's field is, therefore, essential to professional success." (Berkenkotter, 1995, p.1). Professionals recognize that their communication impacts others, and that their choice of genre is situational. Our study helps to shed light on the varying types of genres used by professionals by examining how they see those genres as supportive of "social action" and as ways to understand "how to participate in the actions of a community." (Miller, 1984, p.165)

One common theme that emerged from the interview data is that professionals tend to use either templates, or pre-defined types of documents when making genre decisions, primarily for the sake of efficiency and consistency. One professional stated, "Most of our documents are pre-established templates. For example, Resolution letters for customers, Detection notifications, were all established to ensure consistency and reduce time it took to notify customers" (ENG 332).

Not surprisingly, these pre-defined, genred documents are designed to carry out routine communicative work in a given context. For example, some conventional document types are used to keep track of technical details in product design or project development: "It'll be things like efficiency reports but the main documents I write are specifications for different products that we have" (ENG 332).

Professionals sometimes make explicit choices to write in one genre with the understanding that it will be used in another distinctly different type of document. An email can easily turn into a part of a format proposal, and a spoken conversation can result in the development of differing documents based on the need to disseminate new ideas and to collaborate.

Persuading

Professionals in our study also recognize that merely using a familiar, genred form of communication is only be the first step of effective communication, especially when persuasion is required. When persuading, communicators must be aware of and able to draw upon all appropriate and available means of persuasion.

Frequently, professionals discussed effective writing in terms of the ability to understand audience and purpose well enough to select the most effective, concise, and persuasive information to accommodate. Knowing how information is used can help: "my results [feedback from customers] are used to make design improvements during product development, resolve deficiencies in legacy products and to direct process improvements." (ENG 331). And when communicators have this critical awareness, it comes out as a more complete understanding of the communication task at hand. For example when one respondent spoke of the game design documents he creates, he wrote:

> "These usually include descriptions of mechanics or dynamics, the feedback the player gives or indicates, the purpose of a mechanic, ways to improve the mechanic, and countless other details about small aspects of a game's design. These documents can include any component of the game we're working on and the details about that component. They can be one to nearly twenty pages long which usually depends on the scope of the document. We produce these generally for directors or other departments that need explicit information on components of a game to accomplish their tasks. I also create surveys using a tool called SurveyMonkey that are used to get feedback from testers immediately following the lab" (ENG 331)

Writing persuasively involves considerable analysis beyond stating an initial purpose of a document. As one participant noted, "Written communication allows for the author to spend more time on the work and it tends to be more thought out. This is useful when proposing new ideas to superiors or sending lots of information which can take time to analyze" (ENG 331).

Informing or Problem-solving

Other respondents indicated drawing on all communicative means when writing for problem solving or to inform clients or colleagues. Writing to inform in professional communication involves more than just conveying facts. It involves considering why information might be needed, and how it will be used. For example, one professional expressed it this way: "Technical writing is interesting because it's not all about getting the technical specifications right, that's just

one aspect, but the majority of what I do is translating technical concepts... into business value. Translating from the "what" to the "so what?" (ENG 333).

Professionals summed up writing to problem-solve by using the term "problem based writing," which meant writing about problems or writing in order to facilitate problem solving. Many different types of writing and speaking are used to solve problems during a professional's day, and a focal point for critical reflection is on how that information can be useful and usable to the intended readers: "Any time you come up with something new you want to structure your language clearly so operations utilizes your data correctly and as intended." (ENG 331)

Professionals indicated that they communicate to solve ongoing or future problems. In particular, they described making decisions about the best media to solve problems quickly. One professional summed it up by saying, "Documents? I don't really write that many documents. I primarily write emails that aren't too long. Their content usually is about instructions on how some things need to be done or changed" (ENG 332).

Focal Point 2: The Presentation of Self

In addition to considering the available means for communicating, participants thought critically about how their communication reflected on their professional identities or on their organizations. As such, respondents indicated making explicit decisions about how their writing would reflect their credibility, professionalism, and relationships to others around them.

Credibility

Communicating why a subject is important not only involves persuading a reader of the significance of a topic, but also depends upon and constructs the credibility of the writer. Notably, credibility for writers was often connected to efficiency. One professional stated this in practical terms, "Ineffective writing wastes time and money. If you write poorly, it reflects poorly on you. Writing effectively allows you and your coworkers to get the job done quickly and correctly the first time" (ENG 331). One's credibility was often tied to the ability to decide what content to include in a communication: "Ineffective writing wastes time. If I don't include all the relevant information, the client will have to ask me for further clarification, and I will lose face. If I am not specific or effective with my support team, I will not get the answers I need in the time that I need it" (ENG 332).

Presence and Immediacy

Participants also reflected on how their communication choices would reflect upon their "presence" or perceived nearness to or distance from their audiences. As one participant noted, "Certain ideas do not communicate via email very well. Especially for like creative solutions or things like that. We need the immediacy of feedback. You need to be able to look into somebodies [sic] eyes and you can tell right away, 'Wow that person thinks that that was a really stupid idea.' So it just depends on what we're trying to do. If we're trying to hammer down a set of requirements, that'll be a good mix of both because we need to collaborate it, brainstorming back and forth." (ENG 332).

Many professionals mentioned a time frame of the "past five years" as having dramatic effects and changes on perceived proximity to their clients and colleagues and reflected on how the importance of "nearness" has increased with new technologies. The speed of communication was predominant in many comments, and one professional noted, "Text messaging has become more common between staff, supervisors and co-workers. It is an effective way to communicate basic

information. Also since virtually everyone monitors their mobile phone on a regular basis, you can be reasonably assured that the recipient has or will receive the message, even if they aren't currently answering their office or mobile phone" (ENG 333).

Respondents also noted that with increased speed of communication comes more opportunities for intermixing formal and information communication at work. "When you're talking with your peers face to face you talk a little less formally and when your statements are further reaching, you want to temper your words more towards facts and less opinions" (ENG 331). Implicit in this comment is the recognition that communication technologies greatly impact the reach of one's communication. We can reach more people, more easily, over greater distances, and at greater scales than before and this can make it difficult to decide how formal or informal one can be at any given time. One interviewee noted the impact of technology on the importance of writing, "Five to ten years ago, communication and writing was much more formal than it is today. This change has happened due to the technology advancements that have been made. Email and text messaging have become a standard means of communication in the workplace and [they] are generally informal documents. With that said, one still needs to be careful of what they say in these texts. Ten years ago, the world was not as connected as it is today. Back then, an email was not as likely to reach thousands of people with a social media post or anything like that. For these reasons, I think that writing and communication in the workplace is more important now than ever before" (ENG 331).

Professionalism

Perhaps not surprisingly, the increased proximity, speed, and immediacy of writing on the job leads back to a focus on critical reflection about how one's writing reflects on their professionalism. As professionals lauded the impact of technology for increasing communication, many noted that the informality afforded by quick and easy means of communication can lead to ineffective results. As one professional said, "People need to be able to write professionally. Texting has ruined us. We're so used to writing incorrectly so long as it's 'fast' and we can get the general idea across that we don't take what we write seriously anymore" (ENG 333).

This study illustrates that regardless of the technology used and "how" a message is conveyed, communicators need to be concerned about "what" is being written or said in order to ensure that they are presenting themselves as professionals. One professional noted, "Knowing when to be professional is more important than anything else. This takes a lot of self-awareness. Good communication means paying close attention to details" (ENG 332). The details that seem to matter here include correctness and persuasiveness in writing and speaking, especially given the durable nature of writing as compared to speech. As one professional stated, "I don't take oral communication lightly but written can be reread and analyzed. That can either be a good thing or a bad thing depending on what kind of writer you are" (ENG 333). Another put it this way: "All of the final end products are written, and any oral communication preceding that is valuable, but what is written holds the most weight in the end and what will be evaluated" (ENG 332).

Focal Point 3: Support for Relationships

Finally, we want to emphasize the ways that participants indicated critically reflecting on the role that their choices would play in supporting different kinds of professional relationships and processes. This includes related issues such as organizational memory, collaboration, and decision making.

Organizational Memory

As we have discussed in previous sections, writing in professional contexts is associated with a sense of permanence or durability relative to the role of speech. As such, writers indicated reflecting on the ways in which their writing choices could create documented memory of processes, practices, and knowledge that might not be available otherwise. One professional stated this as a clear purpose behind why writing is done on the job: "If documentation is not written down, then it did not happen" (ENG 331).

In line with this, other writers highlighted how one must consider the role of writing to standardize and document processes in order to create a shared sense of goals and practices across an organization. As this professional put it, "People read what I write to ensure that we stick to a certain level of cohesion within the company and the development of products for clients. It affects the decisions and actions of everyone involved in creating a product. These documents help build a sense of vision, direction, and purpose" (ENG 331). Workplace writers, then, are concerned with the ways that their writing will serve as a record of their work that others will read in order to understand both their individual contributions and the flow of processes. This enables problem-solving later. In essence, writing is part of a pre-problem solving task. One professional outlined the process well, "People read my writing to keep up on how a project is going, to understand the process flow, and for record keeping. Emails and official documents are official records of both parties and can be used in later proceedings if required" (ENG 331).

Collaboration

Related to this theme is the idea that professionals critically reflect upon how their writing establishes good relationships that enable collaboration. Professionals routinely noted that writing long documents, and proposals, was a collaborative effort and one that took considerable time, and thus money. Looking at the typical parts of proposal shows the various types of tasks and information that are involved in creating a long, formal document, "The format of the proposals typically has an overview, scope, detailed plan for the project, responsibilities of the company, responsibilities of the customer, a work breakdown for the project, as well as any other details that need to be addressed, followed by a detailed quote" (ENG 332). The components of a long, formal document include the creation of shorter documents, including visual elements, such as tables and graphs that can assist readers in understanding what has been communicated.

Often, proposals are supported by the creation of supporting documents. One professional noted. "I write marketing campaign proposals to upper management before they are sent to clients. They can be about 10 pages due to the data we collect beforehand for each client. The format is "a deck" with a PowerPoint but accompanied with other documents." (ENG 332)

Proposals can also lead to other proposals. As has been shown, short documents can become part of larger documents, and larger documents can then lead to the need for more communication. One professional illustrated the multiplying-effect of writing as it relates to proposal writing in his comment, "The receiving company of the proposal will analyze and review the information by the CEO, COO and other board members. These documents are read by important operators in the company and proposals that lack concise writing technique and technical information will be ignored and deem unconvincing." (ENG 331)

Decision-Making

Finally, many professionals noted the strategic production of short documents, often still referred to as memos, in order to keep members in an organization up-to-date on the progress of a project or task. When doing so, they indicated the importance of these documents for supporting organizational decision-making. Short reports are often copied to other members in an organization, and the level of detail is dictated by the level of understanding of the intended audiences. Attention to wording is often noted as a constraint as professionals write and send short, informative documents within an organization.

Short documents also include correspondence with clients, and again, they reference quick notification-related tasks that professionals use to track and ensure the progress of work. One professional, again in a detailed list, noted the types of short documents that make up many of their writing tasks: " Employee reports and memos; Correspondence with boss, typically upon request of something from supervisor; Correspondence with client" (ENG 331). One professional outlined with specific details the types of short documents that are commonplace in their workplace, which was commonly seen in other professionals' feedback: "Process Alerts: 1 page document that gives an overview with pictures, produced every time there is a change in the standard work. Standard Work or Visual Instructions: can be 1 page to 20 pages, breaks down the steps and is very detailed, includes what tool, PPE, order of operations the personnel is to follow. Technical Docs: Usually 3-20 pages, very similar to Standard Work but it is not 'standardized', used for tasks that aren't done every day." (ENG 331)

Scenario: Writing and Thinking with Genres

Models, while technically not "documents," are forming at least part of "documents" that writers produce on the job. There is a movement towards model-based systems engineering, where no longer are specific documents used in the development process, but, instead, a series of models that relate and link information together is being used to create the requirements and design of a project. With the advent of the Internet of Things, these models will tie into data from actual operations and environmental conditions to allow full traceability, optimization and improvement during the design, production, and operation processes.

At a department meeting, Mark sat next to a peer who was working on developing ways to implement conservation measures within the company. They talked informally about ideas, and Mark mentioned that he was interested in getting involved in the initiative since he had interests in sustainability. The next day, Mark received an email from the peer's team leader, and he received an invitation to become involved in working on a team that was developing a more sustainable solution to the amount of waste water that was being using on a daily basis at one of the company's satellite sites. If the solution was determined to save water usage, as well as money, then the company had plans to roll out the new process company-wide.

Mark sent a reply back to the team leader accepting the invitation, and acknowledging his excitement in being involved in such a worthwhile project. He was added to the teams' collaborative site, which functioned much like a wiki. Mark found that the team's approach was to have people research specific technical areas and then write up short paragraphs describing their results. A team member would then provide links to other relevant information, as well as link to other team member's related text modules.

Mark began gathering information about dual-flush toilets. He wrote a short document consisting of three paragraphs about how the toilets work. He linked his idea to another team member's section titled "Ideas to Research."

When he checked the collaborative site the next day, he saw that another team member had added a comment and link to an evolving document about how to retrofit toilets for conservation purposes. Mark pursued the idea, and after researching options and costs for retrofitting existing fixtures, he wrote and posted a longer document about his findings with a Technical Description format, which included visuals, of the mechanism for a dual-flush conversion fitting for standard toilet sizes used by the company. His document evolved into a collaborative proposal to purchase fittings for the toilets at a company site and addressed to the CEO and CFO. When the proposal was approved, Mark was tasked with writing the company announcement of the new conservation policy and savings, as well as the instructions for using the new fixtures.

4. Application of Principles of Document Design and Visual Elements

Professionals often rely on prescribed standards to guide decisions that they make pertaining to document and visual design. Longer formal documents, such as business and grant proposals, are usually created to meet the defined requirements of a Request For Proposals (RFP) or a journal's instructions to authors. Also, organizations often utilize style guides in order to achieve a company's standard for documents, which are written for internal and external use.

Even if formal style guides are not used, professionals realize that learning on-the-job results in knowing how to combine and arrange language and visuals in order to respond to the conventions of their professional fields and organizations. One professional expressed this well, "College is the basis (you must know how to write); anywhere you go, however, there is a style that you must assimilate to. Formats must be followed, and may be different from company to company. You must learn on the job to accommodate these. There is also terminology that you must learn on the job rather than in school because of its specificity" (ENG 331).

Use of Prior Documents for Efficiency

Professionals recognize the benefit of using models, prior documents, or their ongoing familiarity with on-the-job writing examples to guide their understanding of effective and efficient design. From this, we understand that effective design is connected to context. While general design principles matter, new employees must learn to tailor those principles to the specific norms of their organization. One participant stated this directly: "Most of the learning had to be on the job training with learning formatting, word choices, and document designs" (ENG 331). Other professionals expressed how they used other people's documents to aid in creating their own, and one stated, "I learned the requirements on the job. The most useful aspect of that training was seeing how others made their documents, so I could see how it was done." (ENG 331). Another professional succinctly indicated a process of using examples as guides by saying, "On the job training, school of hard knocks. Look at previous examples and improve upon them. Most useful aspect is the effectiveness." (ENG 331).

Visuals Supported with Text

Participants also highlight the importance of effectively composing a range of visual genres that support both informal and formal communication in the workplace. On the more formal end of the spectrum, for example, we see participants producing visuals such as graphs and tables that are part of formal report documents for large-scale projects. In one case, "The project documents [one participant] generally writes are 'visual reports' which include graphs and tables to show a trend in data to answer the goal of the project. They can include anything from 2 graphs to 30 graphs/tables depending on the size and material of the project. The final reports are generally for company executives or VPs but he also makes multiple drafts that he may use for himself or a manager" (ENG 331). On the less formal end of the spectrum, we speculate that a lot of meetings, etc probably do produce some visuals to support their text and other invention processes (for example, using sketch-noting or white boards), but we do not have a lot of data to make inferences about the nature of these informal visuals.

Interpreting Graphics, Charts, and Visuals

Participants also note the challenges of explaining visual data to others. This helps us understand that visuals, while efficient and effective in communicating information, can also be challenging to create and require the same rhetorical thought process as creating text, such as anticipating

how audiences might interpret or misinterpret the content. One participant, for instance, noted the importance of internal discussions about the meanings of visual displays. In this participant's experience, visuals often require meetings that enable coworkers to arrive at the same conclusion about their meanings. "Visual graphics, presentations, coding, and updates are communicated easily through video chatting where questions and concerns can be quickly debunked and understood where if using email, it may take several emails and days to communicate and understand what has been completed and what each visual and component represents" (ENG 331).

Scenario: Applying Document Design Collaboratively
James is the senior engineer of an environmental-engineering firm, Greener Solutions (GS). The firm, which started out small, has been growing by leaps and bounds over the last several years, and James is always glad to welcome the new engineers, who bring with them renewed enthusiasm, great ideas, and cutting-edge technical training. Unfortunately, one thing they often do not bring with them is knowledge about document design and visuals. Many of the junior engineers have not had formal training in written communication, and they rely almost exclusively on past reports as templates for their current work. This is true, as well, even for the junior engineers who have taken technical writing courses. Despite their innovation when it comes to engineering ideas, they are loathe to deviate from what was written before, and they glom onto the past reports for dear life—even if the past reports do not contain what they need for their new reports. The reports are often written much as an afterthought—after the completion of a project milestone. The writing of these reports often falls on the shoulders of the least senior team member, and reports are written in Word and saved as PDF files.

James has become increasingly frustrated, because he is spending more and more of his time overseeing the review and revision of the junior engineers' reports and less of his time doing what he loves—getting out in the field and training the junior employees in their engineering work.

GS is a dynamic engineering firm that provides creative and often one-of-a-kind solutions to their clients. The engineers work on projects in a five-state area, and members of the same team might be in multiple locations at any given time. Rarely are all of the employees in the home office all at the same time.

These conditions make it time consuming for James to deal effectively with documentation problems. Many of the junior engineers inappropriately "force fit" the written and visual content of their reports and create reports that are improperly formatted. James, then, has to review the often-faulty reports, mark and annotate the changes, communicate those changes to the junior engineers one on one, and then review the corrected work. James has had many a late-night, one on one, Skype session with many of the junior engineers. He invests far more time in this task than he wants to, and it can take years to bring a newer engineers up to speed with their documentation; years and hours of hours of his time. They lack fundamental knowledge about how to customize the text –based on the content of a report; they do not fully understand what sorts of graphics might be appropriate to complement the text; and they are not fully proficient with the software.

James and the GS management team decided to try something new—a two-pronged approach. First, they are developing an online "crash course" in report development, and each new engineering-team member will be required to pass the course during their first two weeks of

employment. They will not be cleared for field work until they successfully complete the course. The course will cover report content and formatting, from start to finish. It will include a module on understanding the choices for visuals and how to determine which visuals are appropriate in a variety of scenarios. Additionally, the reports will be produced in new way. Each GS engineering team is to spend the end of each day contributing to a shared Google doc and the beginning of the next day reviewing the posted document. This method allows the junior and senior members of each given team to share ideas and to create a more useful document so that by the time James reviews it, it is much more correct and complete than it would have been using the old process.

5. Application of Principles of Effective Oral Communication & Creation of Professional Presentations

Our data suggest that people in a variety of professions rely on oral communication for collaboration, problem solving, and relationship building with internal and external audiences at work. The data also suggest that many of these same professionals rely on oral communication to present information to internal and external audiences in a more formal way. Many respondents discussed these two functions of oral communication as separate activities and skills, and in this section of the report we will focus first on oral communication as it relates to speaking with others and then on giving presentations.

Speaking with Others

Collaborating with Co-Workers

Our survey respondents report that speaking with co-workers is essential for effective collaboration and problem solving. For example, one respondent stated, "It would be impossible to do my job without oral communication to collaborate with colleagues and make sure I have all the correct information and understand the context of a particular project or request" (ENG 333). This quotation touches on the importance of using effective oral communication with co-workers, and it also suggests that oral communication allows co-workers to efficiently confirm they understand the task at hand and each other. This sense of efficiency is echoed in the following responses: "… [with] oral communication [it] is faster and easier to communicate because you can answer questions in an instant" (ENG 332), and also, "Within the office space, oral communication is more important because we often just walk over to each other's office to ask questions about an issue or get their opinion" (ENG 332).

Other responses related to speaking with co-workers continue to focus on clearly understanding the task and each other while collaborating and solving problems. One respondent describes an awareness that written communication between colleagues working on a project can easily be misinterpreted and explains that, "our most important conversations happen over the phone or over video call because we want to make sure everything is being communicated and understood correctly." The respondent goes on to say, "Within our company, we use Slack to chat, but we also communicate in person – especially when we're trying to solve a problem or prevent a small issue from becoming a big deal. We're quick to have a conversation within the office so that we can solve problems as soon as possible" (ENG 332).

This sense that conversation can be more effective than text-based communication platforms was shared by other respondents: "I spent the majority of the day in meeting after meeting, discussing problems that I often was not even aware of beforehand. I'll often bring developers into the office and discuss an issue with them instead of emailing them, and there's plenty more interpersonal meetings between coworkers" (ENG 331), and also, "As a member of a research team, oral communication is critical. This allows us to overcome technical issues, discuss experimental findings and encourage each other" (ENG 333). Finally, one respondent explained, "Emails are not always answered or are not answered fully, so I think oral communication holds people more accountable for what is said. It is also helpful for brainstorming research ideas or methods when you can have a live conversation with someone" (ENG 333). Each of these quotes touch on the notion that talking with colleagues is valuable and can be more effective than relying only on technology to communicate.

In the era of text messages and working remotely, these findings come as something of a surprise; however, when we continue to look at responses from our participants we can begin to understand these trends more clearly. Several respondents emphasized the importance of social context and emotional connection with co-workers. For example, in the last quotation in the paragraph above, we see the respondent suggest that creative interactions are well suited to "live conversation." In the second quotation above, we notice that the research team uses oral communication to solve technical problems, but they also use it to encourage each other. We see a similar sentiment in the following quotation: "Oral communications allow you to have good relations with coworkers and establish relationships (collaboration with other scientists)" (ENG 333). From our responses, it seems that these "good relations" may be easier to establish with face-to-face communication than with text-based communication.

Our quantitative data also show that professionals value in-person conversation when communicating with internal audiences. Out of 961 respondents, 75.96% (730 respondents) "Preferred" to communicate with their supervisors in-person and 80.85% (777 respondents) "Preferred" to communicate with their co-workers in-person. Tables x, y, and z (below) present the quantitative oral communication data that was collected in our survey.

Leadership and Promotion

Throughout our responses, there was a suggestion that senior-level employees, like supervisors and managers, are more dependent on oral communication than their less-experienced colleagues are. For example, one respondent explained, "I speak with my staff to prepare them for tasks and review their performance of the tasks" (ENG 333). Another respondent echoes the need to speak directly to employees: "Oral communication is much more important for a manager, because it's the only way to convey information completely accurately without a thousand inconsistencies" (ENG 331).

This trend may connect with the preference for oral communication between co-workers that we discussed in the previous subsection: oral communication allows co-workers to easily confirm that they understand each other. As a manager, making sure your direct reports understand you and what you're asking them to do is essential, but it may also be essential that leaders connect with employees on a personal level, and it seems that oral communication may still be the medium of choice for developing this connection with employees. One respondent stated, "I lead a team of people and am responsible for developing and driving business strategy. Oral communication is essential for showing passion, influencing cross boundaries and building a collaborative working environment" (ENG 331).

Effective oral communication skills with internal audiences were also repeatedly cited as a requirement for success and promotion in the workplace. For example, one respondent explained that, "Oral communication is what can decide the trajectory of one's career. If someone can speak well, and confidently, then they are that much more likely to succeed in the workplace" (ENG 331). Another respondent made a similar comment: "Speaking skills are very important when building a positive impression in front of your manager" (ENG 331). Finally, if strong communication skills can have a positive impact on one's career, one respondent suggested that the opposite could also be true, explaining that a lack of oral communication skills could "come off as lacking a deep understanding of their own work or field of study" (ENG 332).

There may be a relationship between the notion of oral communication as something that is unmediated by technology or revision and the notion that effective oral communication is an

indicator of potential success. As the quotes in the paragraph above suggest, oral communication can make a strong impression. Taking this a step further, one respondent explained, "Written communication is probably less important than oral because you are constantly having to speak to others and present yourself to coworkers and clients. It can be easier though because you can get their reactions face to face. Also, you can have written documents easily checked and edited" (ENG 331). This quotation suggests that, when "presenting" ourselves through oral communication, we do not have the benefit of revision or spellcheck to polish things up as we do when we are sending an email.

Clients and Customers

Our survey respondents report that speaking with clients and customers is essential for relationship building, and several respondents suggested that getting to know customers and clients through oral communication is the first step in this process. One respondent stated, "You need to get to know your customers and the best way to do that is through oral communication" (ENG 332). Another participant explained that, "In the first couple of minutes talking with a client, take the time to get to know them on a personal level. I'll usually take notes on client conversations when I talk to them. If they mention something going on in their lives, I'll write it down." This participant goes on to describe how surprised and happy clients are when he remembers something about their personal lives and adds " … it makes all of the difference when making relationships with these people" (ENG 332).

A third participant notes that it's very difficult for a written document to overcome the first impression of oral communication: "If my oral communication skills are lacking or if they [prospective clients] don't leave that meeting feeling confident I can manage their money, I lose that account. At the end of the day it doesn't matter how eloquent the follow up email I write to them is. If I don't win them over in person, there is a very good chance an email won't change their minds about me" (ENG 332).

While this type of relationship building might be similar in some ways to the connections developed with internal audiences, comments from participants also suggest some differences in oral communication practices related to external audiences. As we noted in the previous subsection, participants communicating with co-workers reported that oral communication can prevent the misinterpretation of text-based communication that occasionally occurs; however, some participants report an almost opposite experience when working with clients, describing the need to support oral communication with written documentation. For example, one respondent said, " … I first have to establish, orally, the framework of the proposition or system design, and then, it MUST be followed up with a detailed written verification of the result of the oral communication and each party's commitment" (ENG 332).

Another respondent had a similar experience: "Oral communication is used internally since [we] are on the same team, and there is a lot of trust. Written communication on the other hand is used when contacting customers and clients because that keeps both parties from 'scope creep' (scope creep means uncontrolled change in a project's scope after the project commences)" (Stuckey 51). Finally, another participant offered the following advice: "I recommend writing emails if you ever need record of anything, because you can always go back to it if needed. That being said, it is usually much easier to communicate verbally." (ENG 333). These participants recognize a need to balance oral communication with the security that written documentation can provide.

In additional to relationship building, the survey responses also suggest the importance of oral communication for making decisions and finalizing agreements with customers and clients. One participant explained, "The nature of sales is that major decisions are usually made upon in person (or virtual) spoken communication, discussion, negotiation" (ENG 332). Another participant suggests that a written proposal can be helpful to attract prospective clients, but there will still be a need to "seal the deal verbally with good speaking skills" (ENG 333).

As with internal audiences, in-person communication emerged in our quantitative data as the preferred mode of oral communication with external audiences; however, the percentage of respondents who found phone and teleconference communication to be "Preferred" or "Acceptable" methods for oral communication with external audiences was higher than the percentage who found these methods to be "Preferred" or "Acceptable" for internal audiences. The tables below present the quantitative oral communication data that was collected in our survey.

Table 5.1. Oral communication Preferred

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
In Person	76%	81%	53%	38%
Phone	21%	23%	33%	21%
Teleconference	16%	16%	18%	15%

Table 5.2. Oral communication Acceptable

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
In Person	20%	18%	34%	34%
Phone	71%	74%	57%	51%
Teleconference	57%	58%	51%	47%

Table 5.3. Oral communication Not Used

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
In Person	4%	1%	13%	29%
Phone	8%	4%	10%	29%
Teleconference	27%	27%	31%	38%

Younger Communicators

Throughout our survey, respondents vocalized their concerns about younger communicators and the perceived reluctance of these communicators to relate to others through oral communication. As discussed in the next section of this report, these concerns seem to be directly related to the increased use communication technologies like social media. For example, one respondent suggested that, "College and even high school students lack the ability to verbally communicate with teachers, employers respectfully. The ability to hold a conversation without touching a mobile device. Young adults need to learn to stay off of social media and have a conversation" (ENG 333). Another respondent shared similar concerns: "The main problem with the younger generation is that they struggle with verbal communication skills. Many are so used to texting

from their phones or sending messages from their computer that they are unable to communicate well in a face to face setting" (ENG 332).

While our study did not explore the communication habits of younger people and so cannot provide any evidence to support this perceived phenomenon, the prevalence of these concerns from respondents does gives us more evidence that the ability to speak with both internal and external audiences is highly valued in professional life. One respondent illustrates this in the following quote: "College students these days are usually up on the latest electronic technologies more than ever.… However, college grads also need to be able to communicate verbally, have confidence and participate in an intelligent conversation. Give a good strong handshake, look someone in the eye when they are talking them, take ownership of their conversation, be passionate about what they can contribute to their job and the company" (ENG 332). This quotation suggests that oral communication skills and interpersonal skills are perceived as closely connected and that both are important in the workplace.

Presentations

Internal Audiences

Throughout our study, respondents noted that presentations and public speaking are an important part of communicating with internal and external audiences at work. In terms of internal audiences, presentations were seen as a way to demonstrate experience and make an impression on superiors and co-workers, including those that one may not work with on regular basis. For example, one respondent stated, "I think presentation skills are especially important to develop. Strong presentation skills can make a great impression on upper management and benefit a new hire's personal advancement as well as his/her business" (ENG 332). Another respondent explained that he gives presentations when he is "introducing new concepts to his peers or trying to demonstrate what has been financially going on in the company for people outside of his department" (ENG 332). Finally, some respondents suggested that presentations are more commonly given by more experienced employees; one participant explained that, "When more of a senior, [you give] lots of presentations so oral communication is more important" (ENG 332).

As we noted in the introduction to this section, many participants in our study discussed speaking with others and developing and delivering presentations as two separate communication activities, but one respondent encouraged communicators to reconsider this viewpoint: "They [successful communicators] also need to be able to present their thoughts. Presenting is not always standing in front of a group. Ideas are presented in collaborative group settings, on phone conferences, video conferences, water coolers, and in the elevator" (Emerson ENG 331). This echoes another quotation discussed earlier in this section, in which the respondent characterized speaking to others as a way of "presenting" oneself.

External Audiences

In terms of external audiences, presentations seem to take on an especially important function because they allow communicators to share their expertise with new audiences. As one respondent explained, it's also important to consider both developing the presentation and delivering it: "I don't think public speaking is emphasized as much as it's valued in the workplace … Contextual awareness and knowing your audience, as well as finding a medium to convey your thoughts" (ENG 331). Another respondent shared the following experience: "Public speaking is extremely important in what I do especially in conferences and presentations.

… Just recently I was at a convention. I was talking to a potential client and I offered to do a presentation for him and his company later that day. When he walked away, my marketing [person] was in shock because she said she didn't have anything prepared. I told her I had it covered. So we do the spur-of-the-moment presentation which went very well. When we walked out of the presentation, she goes 'wow… you rock!' It is all about experience and having confidence in your speaking abilities" (ENG 332).

Respondents in our survey also acknowledged the wide reach a presentation can have. For example, one participant stated, "Oral presentations of research often reach a broader audience than a papers which have a more targeted audience" (ENG 333). Some participants suggested that the reach of an oral presentation has widened recently due to technological advances. For example, one respondent explained that "…historically if people weren't at the event you spoke at then they missed the opportunity to hear what you had to say. … With YouTube and podcasts it is getting extremely easy for people post oral communication pieces that lets the consumer use it at their convenience" (ENG 333).

Scenario: Speaking at Work

As the head administrator of a large multispeciality medical practice operated by a local teaching hospital, Khaliq spends the majority of his day communicating with internal and external audiences. Every morning he holds a meeting with the deputy administrators he supervises on his management team. In this meeting, he lays out the team's goals for that day and emphasizes urgent action items and areas where particular team members need to focus their attention. While this meeting is a great opportunity for him to provide leadership and increase his team's productivity, it is an even better opportunity for him to listen. In every meeting, he asks each deputy to share their concerns about the day ahead, and, because he does this, he is able to learn about problems that have not yet come to his attention.

Every morning after this meeting, Khaliq also has standing phone appointment with his own supervisor, the vice president of regional practices at the teaching hospital. During this short call, Khaliq and his supervisor have no set agenda; they simply check in with each other about the day. This is also a time for Khaliq to pass on any concerns that have come to his attention in the previous meeting; however, some concerns he "tables" and adds to a list of topics that need to be discussed in greater detail at a more appropriate time. Once a month, Khaliq goes to the hospital to meet with his supervisor in person. This meeting does have a set agenda, and within this agenda Khaliq has the opportunity to raise topics from the list he has developed over the last month. After this meeting, Khaliq and his supervisor usually grab a quick lunch together in the hospital cafeteria.

Part of Khaliq's responsibility as the head administrator is to interview and hire new doctors and employees. He also meets with current employees for routine performance appraisals and whenever disciplinary action or mediation is required. He sits on several committees that explore issues related to community engagement and marketing strategies and leads a team researching the role of the medical practice in health care reform. Unfortunately, he must also reserve a small part of every day to address patient complaints that his deputies have been unable to resolve.

In addition to his daily communication, Khaliq presents information about his practice's performance at a quarterly meeting of the hospital's executives. He also travels to conferences once or twice a year to present his research related to healthcare reform.

6. Effective Communication through the use of Electronic Media

Electronic media have redefined genres and platforms for workplace communication in recent years, including how, when, and through what media employees communicate with coworkers, clients, and supervisors. To begin with an example, one participant discussed how technology is not only the means of communication in her workplace but also the mission of her organization. She stated, "My company's objective is to change the way the world uses technology to communicate. It is centric to our business. We leverage all that's out there. For me, being in a global sales training program, we get instruction from all over and connect to one another via the most sophisticated telepresence equipment" (ENG 332). Being on the cutting edge of technology was important to this participant's employer who both used a range of devices including "WebEx conferencing, virtual private networks, cloud based services providing remote access and a mobile workforce, [and] collaboration platforms like Spark" (ENG 332).

Although several of our participants incorporated new technologies into their everyday work, we also found that some workplaces were less likely to incorporate electronic media. Our survey asked participants about when they would be likely to find several electronic platforms to be preferred, acceptable, or not used. Although the burden of email has now become a common refrain in public discourse about workplace writing, for our participants email remains a preferred means of interacting with supervisors, coworkers, clients and customers, and other stakeholders.

Table 6.1 Written communication Preferred Across Electronic Media

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Email	71%	67%	66%	51%
Social Media	2%	3%	4%	2%
Chat/IM/Text messages	13%	26%	6%	3%

Table 6.2 Written communication Acceptable Across Electronic Media

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Email	25%	31%	24%	24%
Social Media	9%	23%	17%	12%
Chat/IM/Text messages	59%	60%	32%	25%

Table 6.3 Written communication Not Used Across Electronic Media

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Email	4%	2%	10%	26%
Social Media	90%	74%	79%	87%
Chat/IM/Text messages	28%	14%	63%	72%

For these common electronic media devices and platforms, the next section offers additional commentary on why, when, and how these technologies were used. We then reflect on how electronic media constrain communication practices, pausing to discuss how email and other

electronic text create "permanent" records of conversations, projects, and procedures and change how employees often choose to directly communicate with one another.

Common Electronic Media Devices and Platforms Used in Workplace Settings

Participants use many different devices in their everyday work and spend a great deal of time with communication technologies during the workday. While laptop and desktop computers are still central to getting work done, many employees sense that the increasing popularity of smartphones has changed how and when workplace communication takes place. Participants also use a range of applications that organize their collaboration with other team members within their organizations, including Slack, video conferencing, JIRA, Confluence, and Hipchat. We will discuss a few categories of electronic platforms in more detail in the following sections.

Email

One of the most important things we have learned this year is that "If you cannot send a proper, thoughtful email - you're in trouble." A bit to our surprise, email remains the dominant communication platform that our participants associate with professional writing. As illustrated above in Table 6.1, survey data shows that email is the preferred form of written communication with supervisors among 71% of professionals, along with 67% listed email is preferred with co-workers, and 66% with clients and customers. In spite of complaints about the time it takes to manage and respond to professional emails, this platform appears to be sticking around. As one professional stated, "Email is a major form that will be around for the long haul so it is important to master it now" (ENG 331).

Email is ubiquitous to creating longer documents and put to use across the range of the writing and collaborative processes, from the beginning stages of planning to drafting to review. One interviewee expressed the spectrum of email's effects succinctly in standing in for oral communication, "We live on e-mails, presentations, text messages, and IM/Lync/slack. Our younger employees tend to speak less and type more" (ENG 331). Email is used when a document or formal writing task has been completed, and when follow-up and further communication is needed. People communicate to maintain contact, create networks, and to maintain an organization's operation. One professional pointed out that "following up" is important, "It's really important to follow through. You can't expect someone to let just one email or whatever of communication to be sufficient. You can always learn something new as you continue to be in contact with people as well, and it's never a bad thing to network. They need to put the ball in their court and not be afraid to talk to someone" (ENG 332).

We also note that email is associated with communicating to international audiences. In one example, a participant notes that email is best for communicating with his company's international partners because "you can take more time to figure out what someone is saying and how to give a proper response that they will understand. Email has been a huge leap in this regard over phone calls." We also find that email can handle many different kinds of communication, including short informal or longer, more report-like messages that include links and/or visual aids. As one participant put it, "Emails are largely informal and shorter, but some are pretty long. In some cases, the email contains a lot of charts, graphs, schematics, etc., so it's situational. Fellow coworkers are my readers." Email also may be used in conjunction with other technologies that allow for faster, more immediate discourse alongside documented formal responses.

Video Conferencing Software

Alongside email, participants note a movement toward the use of video conferencing software in the workplace. As we discuss in the section on oral communication, many traditional meetings and presentations are moving online. This includes the use of internal meeting software unique to an organization (i.e., "Cisco telepresences" or "the VPN technology used at SAS), as well as Skype and other third party technologies. Participants report that these technologies can be difficult to use with international audiences, however, because of the need to coordinate time and schedules for synchronous communication. As Table 6.4 indicates, video conferencing software is generally considered to be an inferior choice as compared to talking in person or on the phone. However, over half of the population surveyed find these technologies to offer an acceptable choice for communicating with their supervisors, coworkers, and clients or customers.

Table 6.4 Oral communication - Teleconference

	Supervisors	Coworkers	Clients or Customers	Other Stakeholders
Preferred	16%	16%	18%	15%
Acceptable	57%	58%	51%	47%
Not Used	27%	27%	31%	38%

Text Messaging

We were also somewhat surprised to find that text messages mentioned frequently as platforms for professional communication. Texting has become more common in workplaces between employees in the same organization, often standing in for email in cases where information is needed quickly. One participant puts it this way: "Since virtually everyone monitors their mobile phone on a regular basis, you can be reasonably assured that the recipient has or will receive the message, even if they aren't currently answering their office or mobile phone."

While this kind of internal communication seems to be common, we are even finding that some professionals text for professional purposes with others outside their organization. For instance, one participant writes, "I text major customers and business people on a regular basis." It is important to note that the use of texting as a platform for professional communication has been adopted unevenly, and thus there is great variation across our participants' understanding about its appropriateness. As one participant suggested, "I will rarely text coworkers, but only if I know them personally. It's inappropriate, and unprofessional to text when communicating with clients, stakeholders, etc. because it does not always allow one to communicate clearly, and that is extremely important in this field."

Perhaps not surprisingly, participants in some fields of work take things a step further to argue that texting is not only inappropriate but detrimental to writing ability: "Texting has ruined us. We're so used to writing incorrectly so long as it's "fast" and we can get the general idea across that we don't take what we write seriously anymore. When it comes to scientific writing, it's not about how you feel or what you think is right- it's about facts."

Social Media

As with texting, there is wide variation across participants' uses for and perceptions about social media in the workplace. Some companies do not use it at all, while others use it constantly. One participant mentioned that social media has changed the nature of internal communication, pointing out the use of Yammer as an internal forum for "to post and answer questions at the workplace." In addition, participants are using social media to stay connected with peers who work in their fields but outside of their organizations. "In terms of industry, things like Facebook and LinkedIn allow you to passively stay connected to peers more easily as their careers continue to evolve."

Again, however, there is a sense that social media is a potentially dangerous site for professional communication, and is associated with habits that many new employees need to outgrow. In particular, as we discuss in reference to oral communication, there is an idea (sometimes implicit) that new, young employees need to outgrow their habits of constant social media language and phone checking and abbreviated language use, even when social media is necessary for business operation.

The Constraints of Electronic Media

As we have just discussed, the attitudes toward and uses of electronic media in the workplaces of the professionals in this study is complicated, and we are seeing quite a lot of variation across different fields and organizations. However, some effects and functions of electronic media are clear and shared. These platforms generally afford fast communication across distance and across different roles. They create a context that brings people into easier contact with one another. As a result, learning professionalism and restraint in writing with electronic media is key and a lesson sometimes learned through trial and error. As one participant put it, "Early on in my career I sent an email to a supplier and it was all in capitals, capital letters. I was not happy with them but it was not good. I mean it didn't ruin the relationship but it put a real kink in it."

Permanence

Writers need to keep in mind that writing for electronic media creates a record of communication. The perceived "permanence" of the written electronic word, especially in the context of sharing platforms such as email, texting, and social media was an important positive function of the written word in workplace contexts: electronic writing often allowed teams to develop a shared plan for projects and goals. In this vein, participants also discuss how writing works hand-in-hand with meetings and other oral communication by documenting a record of what was said, what needs to be accomplished, or instructions for moving forward. This sentiment also seems to be influenced by frequent talk about storage technologies (e.g., Dropbox, Drive, other cloud services) as well as technologies like Adobe Acrobat that make documents more permanent and indelible.

Importantly, the rise of electronic writing as an archive for work also means that participants experience increased accountability for what and how they communicate. Generally, participants positioned electronic writing as a "record of what is being conveyed, and one that cannot be distorted due to a poor recollection of a conversation." This sense of how electronic writing lends a permanence to workplace communication extended from the realm of medicine to engineering to business. Participants noted a sensitivity to the potential legal ramifications and accountability that accompany this characteristic of electronic workplace writing. As one participant noted,

"You have to make sure to include detail in all of your writing because you never know what it can be used for. It could potentially be sent to court for evidence."

Flexibility

An important constraint of electronic platforms for many professionals is the flexibility that they lend to communication choices across internal and external audiences. Because email is flexible, we find that conventions for how emails should be written can vary significantly across organizations--and with different audiences internal to an organization. One participant, who mentioned email is the most important professional writing skill needed by new employees, said, "You need to really know how to constantly check emails and make sure that you're able to really gauge how you're supposed to respond, whether it's supposed to be formal or informal."

Etiquette

Finally, we want to note that in spite of the flexibility of electronic platforms, participants stress the importance of learning and practicing basic etiquette in their online communication. common theme that emerged regarding email was the importance of how they are written. "Email etiquette" was often mentioned in the interview comments, as well as the importance of being concise. One professional said, "Email etiquette is SO important. If you cannot send a proper, thoughtful email - you're in trouble. And in whatever form of written documentation you do in your job, you need to be concise but detailed, and clear" (ENG 332). In either case, participants note the importance of appropriate etiquette in email, as well as the ability to be both concise and precise. For example, one participant discussed the common problem of including vague dates ("I'll see you tomorrow!" -sent at 12:45 AM)" or using ambiguous terms ("Should we do option 1 or option 2?" & "We should do that option!" "Which option are you referring to?").

Scenario: Writing with Electronic Media

Sarah is a research scientist working on a complex federal grant proposal that involves colleagues from across five different research institutions. As a result of a change in expectations about how to divide the work to be completed, Sarah needed one of her colleagues at another university to make a simple change to a budget line item for their collaborative proposal. She wrote a quick email to Mark, copying the other four team members on the project in order to keep a full-team record of the change. Unfortunately, Sarah used an acronym to describe the budget item she was referencing that Mark did not understand. As a result, Mark made an incorrect change to the budget, which Sarah did not notice until her university research office began their audit of the project before submission. In a rush to meet the deadline that week, Sarah sent a follow-up email to the team to try to correct the mistake; however, due to the confusion, Sarah's team exchanged 25 emails on the subject over the course of several hours and their conversation used about 4 hours of the team's work time.

To make sure that the change had been completed correctly and the project was back on task, Sarah accessed her ongoing IM conversation and asked Mark if they could speak via teleconference on Skype first thing in the morning. They set a meeting in their Outlook calendars for the following day, when they met to ensure that the team was back on track.

7. Supporting Individual and Collaborative Work Through All Stages of the Writing Process: Research/Planning to Publication/Final Delivery

As most writers know, the writing process is a recursive process that involves all sorts of steps: brainstorming, research, drafting, editing, rewriting, proofreading, and eventually publishing and delivering. However, comments in the qualitative data provided an array of responses that suggests that the writing process for an employee or group of employees is a much more fluid and collaborative situation than one might expect. It seems highly probable that the writing process in business and industry is heavily dependent upon a feedback loop, and, at times, how that feedback loop is constructed. Different businesses/industries will have different feedback loops that have developed over time and work for their business/industry, but not for other businesses/industries. In most cases, however, the goal is to achieve clear writing (in whatever medium and to whichever audience) to reduce time spent in confusion or to get a client what he/she needs.

What does the writing process look like?

Planning and Drafting

For many respondents at larger companies, the writing process for longer, involved documents such as reports is collaborative and happens with internal audiences—their supervisors and coworkers. For the planning stages of the writing process, research participants describe the importance of being closely connected to coworkers in order to facilitate conversations that are part of planning for writing. Several respondents, for example, describe using quick technologies to facilitate writing development by sharing ideas with coworkers. The most popular of these seem to be Slack, hipchat, and yammer.

One participant, for example, described using Slack as a way to keep an eye on and provide feedback for projects that might be at the periphery of his or her attention. Using that technology, "people can pull me into those projects whenever they need my input and I have access to their entire archive so I'm able to get up to speed with what's being discussed and how I can best help them." (ENG 331) Another participant described using similar technologies (i.e., hipchat and Slack) when writing code to plan and share ideas quickly. In the participant's words, "Instead of having to see if they are available in their office, one can just send them a message and wait for a response." (ENG 332). Other collaborative forums within organizations work similarly. In this case, "[Collaborators] use online writing tools similar to bug tracking systems. These are very helpful for collaboration. They work much like a forum might where a problem is posted and anyone can contribute work towards a solution to the problem until the problem is solved." (ENG 331).

While many participants described how internal audiences of coworkers shape writing processes, other respondents emphasize the importance of external audiences in shaping their planning and drafting moments. Interestingly, for example, one participant described his or her clients as "direct supervisors," who shape the writing process because he understands himself to "build to their specifications and for their benefit" (ENG 331). As with the importance of communication technologies for keeping writers in close contact with coworkers, one proposal writer discussed how "video conferences with clients" directly shape writing processes by providing "a direct connection from team members to clients." She described how "her team will use Skype to speak directly to their clients and group chats/messages between team members." (ENG 332). In

another example, participants discussed using mobile phones and Google drive to co-draft presentation materials while on the go. Referring to the ability to write together, the participant reflected, "If you have the right app, you can do this on your phone while you're in the field away from your computer. It's a game changer" (ENG 331).

For some respondents, notably those who are self-employed or working at small companies, the writing process is much more individualized. In one example, a participant discussed drafting as an individual act that takes place after team research processes. In this participant's words, "I write to communicate my progress and the findings of my research team. Other people in the company read my work in order to collaborate with my teams work. Our findings help them move forward with their work and vice versa. Our customers read what we write in order to effectively use our products." (ENG 331)

As far as locating information goes, several respondents note that they are on the internet several hours a day, locating information. For some respondents, that internet time is spent on the Web, while for others, that internet time may be spent on the technologies mentioned above, or company intranet pages. Still, what is important is that respondents are using technology and information to locate information to help them plan and draft documents.

Review, Editing, and Feedback

Participants in our research suggest that review is important. However, procedures for review vary significantly across projects and organizations. One participant suggested, for example, "Big reports will be peer reviewed, and go through some level of management review, more for content than structure itself. For the bulk of the work that I do, I am the sole reviewer, particularly when it's within the company" (ENG 331). Similarly, another respondent stated that "all formal documents that get shown to customers are drafted by the engineers and passed onto a technical writing group for finalizing" (ENG 331). Clearly, peer review/feedback and editing before eventual delivery are important to employees so that they present a good product to clients.

Review was particularly important to participants from the scientific community, who understood review to be built into the collaborative structure that prepares them for publishing their results to the scientific community. As one respondent put it, "All of our writing goes to intensive peer review of everyone at the lab because the company is so small. We have to check over ourselves or we can be scrutinized by the science community if anything is off." (ENG 331)

What does collaboration look like?

For many respondents, writing and work are indeed collaborative, again for some more than others, but in general, most respondents claimed they spent some time collaborating. As with the above discussions, that collaboration could take place in two places: internal (between colleagues and supervisors) working environments, and external (between business and client) working environments.

In addition, how that collaboration happens depends on the environment; some internal collaboration will take place in the office, while external collaboration may take place in the office or in some kind of electronic format. Nearly all global collaboration will need to take place over some kind of electronic format because of time zone/workday constraints.

The reasons for this collaboration vary with the product/service and whether or not the collaboration is internal or external. For example, internal collaboration at a gaming company may take place in order to complete programming on a game, while at another business, such as a civil engineering firm, external collaboration with the client would be necessary to develop the kind of wastewater treatment plan the client needs.

Internal Collaboration
We must communicate with our colleagues to work on projects; that's the nature of work. Many respondents noted that they spent a lot of time collaborating with coworkers or colleagues to get writing or projects done. In fact, many described the processes through which they collaborate with these internal audiences.

As one respondent described, "Certain ideas do not communicate via email very well. Especially for like creative solutions or things like that. We need the immediacy of feedback. You need to be able to look into somebodies [sic] eyes and you can tell right away, "Wow that person thinks that that was a really stupid idea." So it just depends on what we're trying to do. If we're trying to hammer down a set of requirements, that'll be a good mix of both because we need to collaborate it, brainstorming back and forth. But at the same time, if it's not written down no one's going to remember it 20 minutes later. So we want it to be as creative as possible and complete as possible." (ENG 331)

Another respondent described the collaboration process this way: "The whole team checks over all of our stuff, so it's very collaborative. Even the best writer(s) on the team send their content out to everyone else, because it's important that people with no context look over the writing to make sure it makes sense, since most of the consumers of the final content will be coming to it with no context…Ultimately, the writing is assessed by the people who are consuming the content, but we don't have any sort of formal assessment system – it's either working (i.e. being successful at achieving the goals we have for growing revenue and getting leads) or it's not." (ENG 331)

Still another respondent highlighted the importance of effective communication for effective collaboration: "Ineffective writers can be very damaging to your team...both the dynamics of your team as well as the operational efficiency. When thoughts are not conveyed clearly, it may take additional back and forth exchanges to get clarity, this process takes time. In the engineering world where each engineering headcount is making \$50+ an hour, this continued back and forth exchange to try and decipher the meaning becomes quite costly and inefficient. At the same time, frustrations can develop as things are lost in translation which ultimately hinders team morale and collaboration." (ENG 331)

For some, their entire job depends on their communication, and much of that collaborative, as one respondent noted in the interview: "Honestly, probably 85-90% [is spent communicating]. Most of what I do is communicating, so we use email and Slack, which is essentially an instant messaging chat system with teams that are broken down by channel and/or subject. We have a different channel for each of our clients, and we also use Slack to communicate at work within our office. We chat throughout the day constantly, and we also communicate with clients through that platform. (ENG 331)

For others, as well, those internal audiences go up the "chain of command." As one respondent describes, "The most import documentation that I write is the process engineering flow chart.

From that the entire business process is revised to fit the model. Workers need training on the model so that their actions can fit the requirements so the training documents are the next most important. And then follows the progress reports to executives and recommendations for further improvements – which the executives would argue are the most important." (ENG 331)

And last, but not least, some respondents collaborate because they are in a supervisory capacity: "My role as a software product manager is a blend of engineering and management trade so it's a bit different than the traditional full-time engineer who would allocate a good portion of their time writing code. One of the core focuses of my role is to identify what features to build into the product, justify the business case to the engineering team and collaborate with them to build out the solution design. I spend at least 40% of my time writing, [which is] split up into sending emails, reviewing designs, writing specs for our engineering team to implement. Another 50% of my week is spent communicating with others in design meetings, delivering presentations, gathering requirements with our customers, and other miscellaneous meetings." (ENG 331) So for some respondents, they must collaborate not only with clients, but also with employees they are managing.

External Collaboration

A number of respondents suggest that the client or customer is directly involved in the process of producing what it is the client wants, and by extension, use the external collaboration process. For example, as the "team" worker from above continued, "Honestly, our clients are the ones who have final approval of the content, so it's assessed by team members first and then clients second. We do all kinds of data and tracking, too (click-through rates, blog post views, email open rates, how the call-to-actions are performing on the blog posts, etc.), so that data is usually pretty indicative of how well the blog posts are being written and whether or not they're doing their job and communicating the point we're trying to get across." (ENG 331).

Similarly, another respondent shared the importance of client interaction: "Design documents are read for two reasons primarily. Firstly, it's read by the developers to determine how the project is meant to be built. It will be updated occasionally, so the developers need to make sure that they're meeting the requirements, and following the design to work as an effective team. The other reason it's read is by the client, who needs to make sure that there's a good understanding of the project, and that the requirements will be met. The client will usually show up with a document of their own, stating what questions to ask, and what requirements they have, and then he will help write up a document describing how they'll do it, so the client can review, and make sure it does what they want." (ENG 331)

In addition, a gaming employee states that "seeing people, hearing people, and experiencing their reactions to our games is a vital component of my job." (ENG 331) So, for some companies, external audiences help them create product.

Similarly, clients drive product sales, so they are indeed an important audience. As one respondent notes, "When working in groups or on teams, we would produce a proposal almost daily. If you are working individually, you're expected to produce about one per week. Potential customers would read the bid responses and based on that they decide whether they are going to buy your product so these are very important in terms of keeping the company going and making sales." (ENG 331)

In short, for some respondents, the client is an important audience and just as much a part of the feedback loop as coworkers.

Global Collaboration

As we know, our world is globalizing, and communication and collaboration are no different. Several respondents noted that they had to collaborate with others around the globe to do their jobs, whether it be internal or external collaboration. As above, the internal collaboration happens to get an internal project done, while the external collaboration may happen with a foreign client.

For example, one respondent shared: "In technology we do something called "chasing the sun". So we'll work on code 24 hours a day. We'll have a base here, a base on the west coast, a base in Japan, a group in India, a group in Europe. We'll literally work on code and just pass it off to the next group around the clock. It depends on what the problem is and what you're trying to do. Sometimes it's a web-ex calls, skype calls, sometimes it's just a phone call. Sometimes it's just an email. It just depends how important it is, how much feedback you need while doing it, is it a collaborative thing you're talking about or is it a trouble-shooting thing. With trouble-shooting, we really preferred email for a lot of that because it gives us a good trail and we can work our way back through it. If its collaboration and design, it'll be a mix of a couple different modes. We don't use fax machines anymore." (ENG 331) In this case, the company uses internal collaboration modes and technology to keep the project moving.

Another respondent says that a major portion of the day is dependent upon global collaboration: "A lot. About 75% of each day is filled with talking to others. I do a lot of the smaller parts of bigger goal, so my work requires collaboration from other people across the globe." (ENG 331). One might note here that the global collaboration in this example may or may not be direct writing collaboration, meaning that the global counterparts may not be providing direct feedback about writing. However, the end result is still the same—the finished work depends on the global collaboration to be built.

How does collaboration intersect/overlap?

What is perhaps most interesting about all of this collaboration—internal, external, and global, is that they overlap. In short, a document may need feedback or input from all of these audiences or writers to become "finished." For example, as one respondent notes, "My writing is generally in the form of correspondence with clients and employees. My clients read what I write because any change in our designs or questions I may have regarding their preferences and specifications directly affects their lives, especially since the majority of my designs are houses that people live in every day. My employees read my writing for a similar reason, in that if I felt the need to contact them, or draft a correspondence, instead of meeting in person, it generally concerns something important about a current project, design, or client. Basically, people read my writing because if they don't, we can't do our jobs right, if at all." (ENG 331). In this case, like the manager above, there is a feedback loop that is created among a client, a manager, and the employees. All three must work together (though presumably not always at the same time) in order to achieve the goal.

In addition, another respondent shares that the feedback loop involves all three groups: "Ineffective writing in my organization means that I'm not doing my job. It is imperative to have clear and concise communication between me and my coworkers because they rely heavily on my interpretation of the data and feedback we receive from testers." (ENG 331).

Clearly, for most respondents, the writing process usually involves some sort of collaboration. Not everyone may be writing a collective report or proposal, but everyone will need to depend on information from another individual to complete the small task at hand to keep the big project running smoothly. For some companies, keeping the project running smoothly involves a lot of writing via email or documents, while for others, it might involve more casual technologies like Slack or hipchat. Still others may use different feedback loops that work for their companies. In short, collaboration happens at all stages, it seems, from planning and researching to drafting/editing to publication/final delivery; in fact, it seems that collaboration is almost expected and a part of the business workday.

Scenario: Collaborating at Work

Claire works for a gaming development company as a project manager. She supervises a team of game coders, another team of game beta testers, as well as works with a marketing professional with focus groups. She also reports to the Vice President of Game Development for her company.

For Claire, collaboration starts with the game itself. She must work with her team to brainstorm ideas about how the game should work, and about how the game code should be written and documented. As the team works on an initial/alpha version, Claire might work on code herself, or might be available via a company intranet chat like Slack in order to answer questions her coders might have. In addition, she may have to use either the company intranet pages or the internet/Web to find information to help the coders make the game more realistic. (Case in point: if the game is a FPS game, she might need to do research about a particular gun. However, she may also delegate some of that research to the coders).

In addition, Claire would need to work with the marketing manager to schedule focus group testing and questions for feedback. A third activity she would need to do would be to prepare progress reports for the Vice President. Still another activity might be correspondence with any clients who want the game produced at a certain time, or with a certain feature.

As Claire works on these activities, she is in a continual feedback loop. She must take in information from the client, the VP, the marketing manager, and her team to keep the project running. As she gets information about what the game needs to do, when it needs to do it, etc., she will have to provide feedback for the team. They will then have to implement her notes or suggestions, or provide reasons why those cannot be done. She will likely have to go through at least some of the coding documentation as well. If the suggestion/request cannot be met, she will then have to go back to the client or VP and explain why, and possibly get new suggestions/features.

Once the game is in a more finished state, the collaboration doesn't stop. From here, Claire must release the game to beta testers. Sure, they probably did some debugging early on, but beta testers do a full run of the product the way it is to work out any other small bugs. In addition, these beta testers can be anywhere in the world, so Claire will have multiple reports to process. Once she has these reports from the beta testers, she will have to get that information back to the team so the code can be fixed. She'll also have to do more progress reports to the VP, and perhaps work with the marketing manager on the focus group and questions if there have been significant tweaks to the game.

Then, once the game has reached its semi-release version, Claire will need to work closely with the marketing manager who does the focus group testing. Once those results are in, the team will need to go back and re-write any majorly problematic code. Once that is done, Claire will then need to work with the marketing manager to schedule the game release.

8. Conclusion

What did we learn from this study?

As with previous studies (beginning in 1996 and most recently in 2013), communication is clearly essential to daily operations at most businesses. Written and spoken communication is a crucial part of the workplace for many of our respondents, as 94% of our respondents said that writing was at least moderately important for their jobs, while 75% labeled writing as Very and Extremely Important. 83% of respondents stated that writing was important for their performance appraisals. In short, communication, both written and verbal, continues to be an important part of any graduate's job.

Written communication can happen between coworkers, between an employee and a boss, between a company and a customer, and any combination of those groups. In its most generalizable form, written communication serves a transactional function by supplying information or perspective that addresses problems of knowledge or action across domains of professional practice. The culture of the organization does set what written and spoken communication looks like; for example, a programming business might use Slack or hipchat for quick updates among employees, while an engineering business may rely on proposals for clients. Spoken communication in the form of presentations can be used for customers/clients or for other employees. Still other writing can happen in a collaborative environment, and that collaboration can happen between coworkers, between coworkers and supervisors, and between the company and the client.

Similarities and Differences between 2013 data and 2017 data

A lot of the data points between the 2013 report and the 2017 data are similar; most of respondents are in the engineering or "other" category (often times, "other" means they fulfill two or more roles at the company). Also, a hefty percentage of our respondents, almost 62%, work for companies with more than 500 employees; that is up from 57% working for companies with more than 500 employees in the 2013 data. Also similar was that approximately 62% of respondents indicated that a technical, business, or science writing course was taken in college, up only slightly from 60% in the 2013 report.

A notable difference was that the technical, business, or science writing course being required went up from 51% in 2013 to 87% in the 2017 data. Another notable difference is the metric about writing being important to a job. In 2013, 91% of respondents said that writing was either "very important" or "essential" to their job. In 2017, though, only 75% indicated that writing was "extremely" or "very important." Some of this variance could be that the 2013 metric gave the options "Essential," "Very Important," "Not Very Important," "Unimportant," and "Irrelevant." However, in 2017, the metric options were "Extremely Important," "Very Important," "Moderately Important," "Slightly Important," or "Not at all Important." While that's a slight shift in language, the change from "Not Very" to "Moderate" opened a new avenue. In this respect, 94% of 2017 respondents indicated that writing was at least moderately important to their job, which is much closer to the 91% reported for the 2013 study. In short, what we can take from each of these studies is that writing/written communication continues to be important in technical, business, and scientific contexts.

In a related topic, 86.5% of respondents in 2013 said that their writing was important to their career advancement in 2013, while 91% of the 2017 respondents said that writing was at least

moderately important to their career advancement. As in the previous example, the metric options were different, but we can still draw the conclusion that writing and the quality of writing is indeed important to career advancement.

One trend that continues from the 2013 report is that employees tend not to use social media for communication for supervisors, coworkers, clients/customers, and other stakeholders. We would surmise that this lack of social media use stems from the fact that most respondents are not working in Public Relations for their companies; some larger companies have a separate department for PR, while the engineers, programmers, researchers, etc work on the products. Chat and text usage vary, as in some companies those platforms can be used in certain circumstances. For example, as outlined above, programmers may be more likely to use an IM service like Slack to communicate with team members, while other respondents might use text to chat with employees and even customers. Again, though, that usage is company-specific, as each company determines its culture and device usage.

As for device usage, a desktop and/or a laptop are still most used/privileged devices at high percentages (80-100%), though phone and other handhelds hold a high spot in the lower frequencies (0-20%). Some of that may stem from the fact that employees might use a work desktop or laptop while at work, and use the phone or other handheld while at home on nights and weekends, and responding there is still deemed "work." Tablets seem to not be preferred, but again, that is likely company and employee specific.

In conclusion, though there are some slight differences in the numbers in the 2013 and 2017 studies, both bear out that written communication is indeed important on the job. Professionals in any field may be expected to use some sort of written communication to either get their job done, and many of them can expect to have their writing used as part of their performance appraisals. In this respect, helping our students practice the kinds of documents they will be writing in the future is good practice.

Suggestions for Further Research

Like most ends of projects, we are left with avenues to explore in addition to the results we have found. One avenue is to explore younger workers. Some respondents indicated that younger workers seem less comfortable with in-person communication. In the next study, we could review the relationship between age and various communication preferences. Another question about communication preferences could consider how and when professionals use other devices for work, even when they are not at the workplace. Professionals indicated a trend toward more incorporating phones and other handheld devices into workplaces, and we also wonder about how these devices are shaping processes of invention, review, and revision. The mere presence of tablets, phones, and other handheld devices as mediators of writing practice point to interesting input/output issues regarding readability and usability of documents as well as the challenges of writing (thumb typing, swiping, writing as managing componentized content).

In addition, with the ever-developing social media platforms, we could explore more in depth how businesses and employees are (or are not) using social media in their jobs, as several respondents mentioned using social media. It would be interesting to see if social media usage goes up in the next few years. As social media and other short-form writing platforms proliferate, we also wonder about how perceptions about what counts as writing are changing. Programmers, for example, indicated the lowest percentage of time spent writing; however, our qualitative data

and experience with the industry suggests to us that programmers write nearly constantly. The most used platforms and genres, however, are untraditional as compared to reports, memos, and other expected professional writing genres.

Another avenue for exploration is how businesses use collaboration. As noted above, a lot of workers collaborate with other workers to produce the final document, but collaboration is not a separate, focused question on the survey. Future iterations of the survey could ask about the nature of collaboration more specifically, such as when collaboration happens, or what kinds of projects collaboration happens with, etc.

Yet other avenues to explore are global communication and technology's impact on communication. While some respondents use global communication and technology heavily, others may not rely on global communication. The 2013 study posited that "employees in large companies with over 500 employees engage more in international communication than employees with fewer than 50 employees. This was consistent with the findings from the study conducted six years ago" (D. Covington, CIW report, 2013, pg. 6). It would be interesting to see if this statistic changes as the business world becomes more interconnected.

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Appendix A: Professional Fields: Data and Comparisons

In the sections that follow, we report mean scores among the fields for which we had sizable subgroups: education, engineering, finance, management, marketing, programming, and research. We will also discuss differences between the fields pertaining to the following survey questions:

- What percentage of your work week do you spend writing (e.g., planning, drafting, revising)?

- What percentage of your work week do you spend working with others to plan and write documents?

- What percentage of your work week do you spend working communicating with people from other countries?

- What percentage of your work week do you spend communicating with the following devices: Desktop, Laptop, Tablet, Phone, Other Handheld Devices? For this question, we have cleaned the data to omit responses from participants who chose "0% to 5% of the time," since this category could indicate use and nonuse.

Education

This group consists primarily of professionals with teaching responsibilities, as well as curriculum development.

It is interesting to note that educators spend 30% of their time writing on-the-job, which is just a little below the mean of 31% for all professionals, and equal to Researchers.

Educators report spending 15% of their time collaborating with others when planning and writing documents, which is again below the mean for all professionals. This percentage is a little lower, but still consistent, with the prior data collected for this group, which indicated that educators spend 18% of their time engaged in communication activities requiring collaboration.

Educators spend the least amount of time communicating internationally with peers (8%) than the other professionals who responded to the survey, and this figure is consistent with past data.
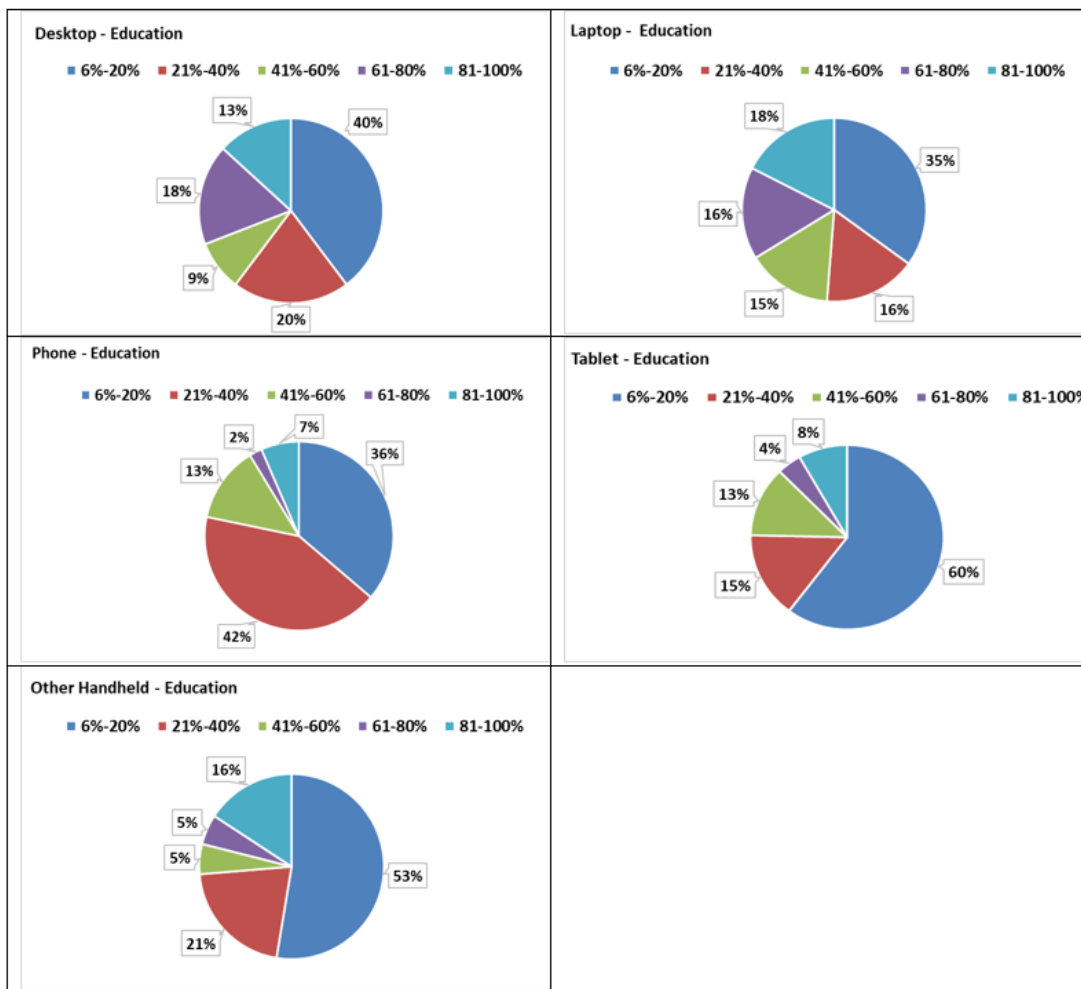
Educators tend to use desktops a little more frequently than laptops, and 60% indicate that they use tablets 6-20% of the their time communicating on-the-job.
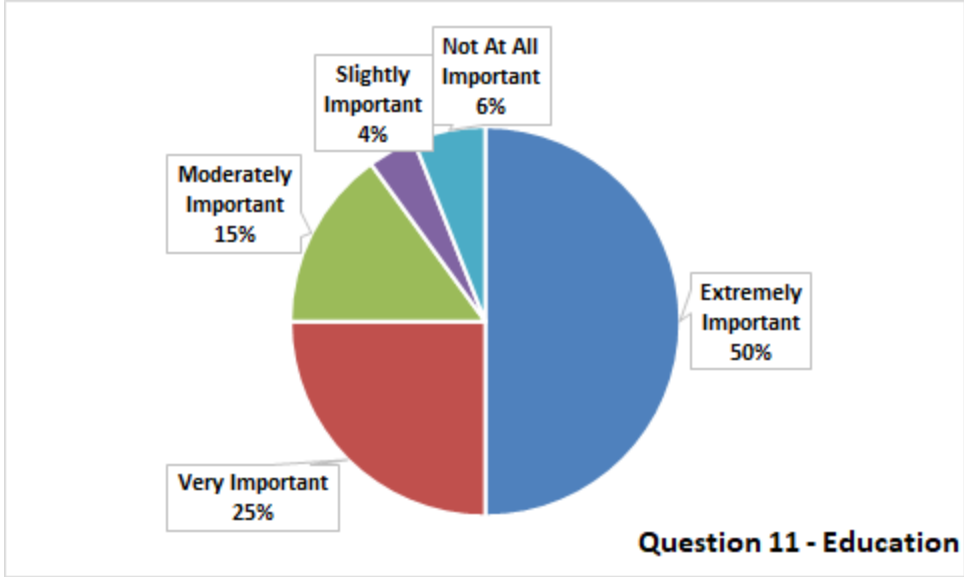
Appendix A: Figure 1. Writing quality and job performance - Educators
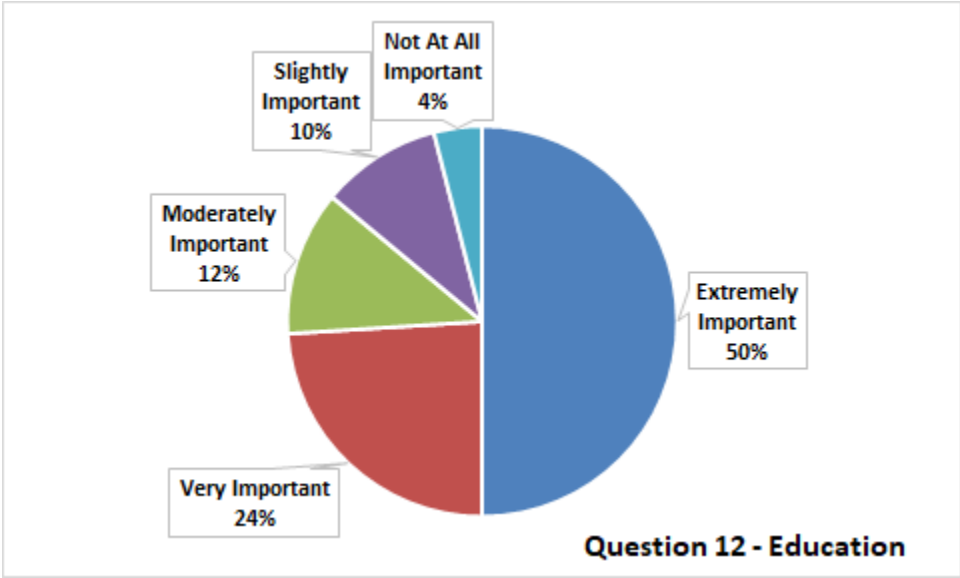
Appendix A: Figure 2. Writing and career advancement - Educators

Desktop - Education
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
13% | 40% | 18% | 9% | 20%

Laptop - Education
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
18% | 35% | 16% | 15% | 16%

Phone - Education
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
2% | 7% | 36% | 13% | 42%

Tablet - Education
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
8% | 4% | 13% | 60% | 15%

Other Handheld - Education
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
16% | 5% | 5% | 53% | 21%

Appendix A: Figure 3. Percentage of work week spent communicating with devices - Educators

Engineering

This group consists of engineers from various disciplines that include mechanical, civil, industrial, textile, and aerospace engineering.

Engineers spend 35% of their time writing on-the-job, which is consistent and equal to the average of the findings over the past 10 years (i.e., 32% in 2007 and 37% in 2013).

Engineers have indicated on average that they collaborate 19% of their time communicating with others in their writing and speaking tasks, which is a little above the overall average for all professionals. 14% communicate internationally with other professionals, which is more than the average, and an increase from five years ago from 8% indicating involvement with global communication.
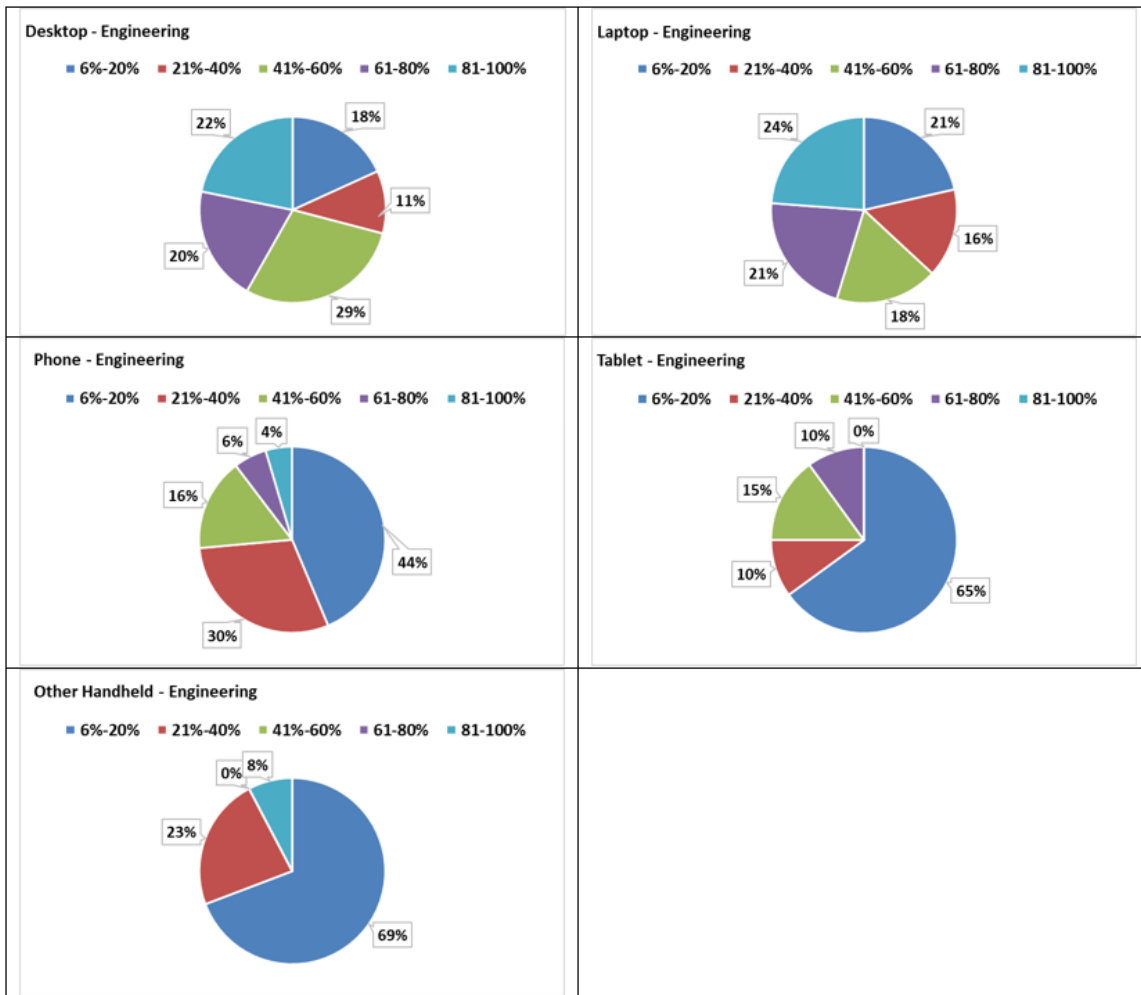
Engineers indicate that they use desktops more frequently than laptops or tablets. 44% indicate they they use phones 6-20% of the the time on-the-job.
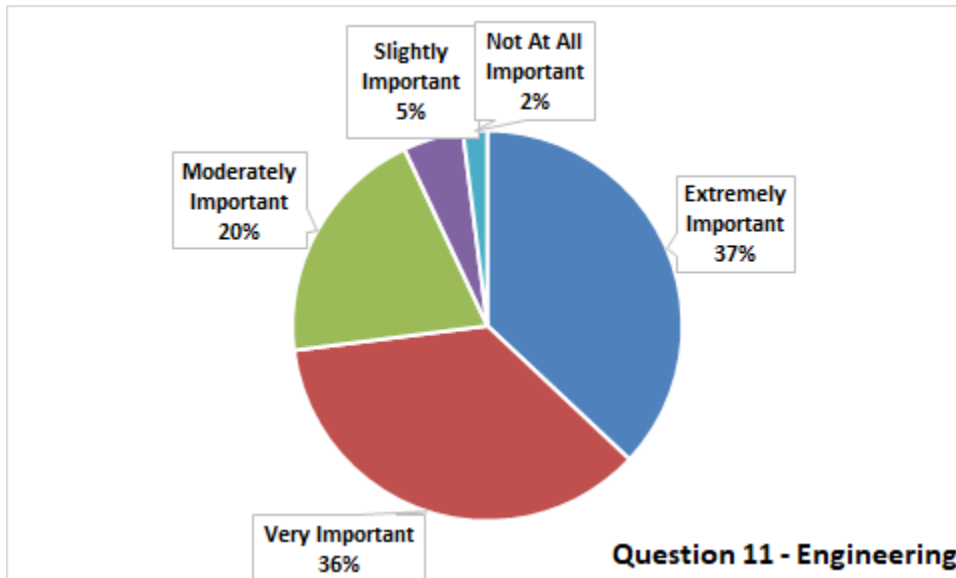
Appendix A: Figure 4. Writing quality and job performance - Engineers
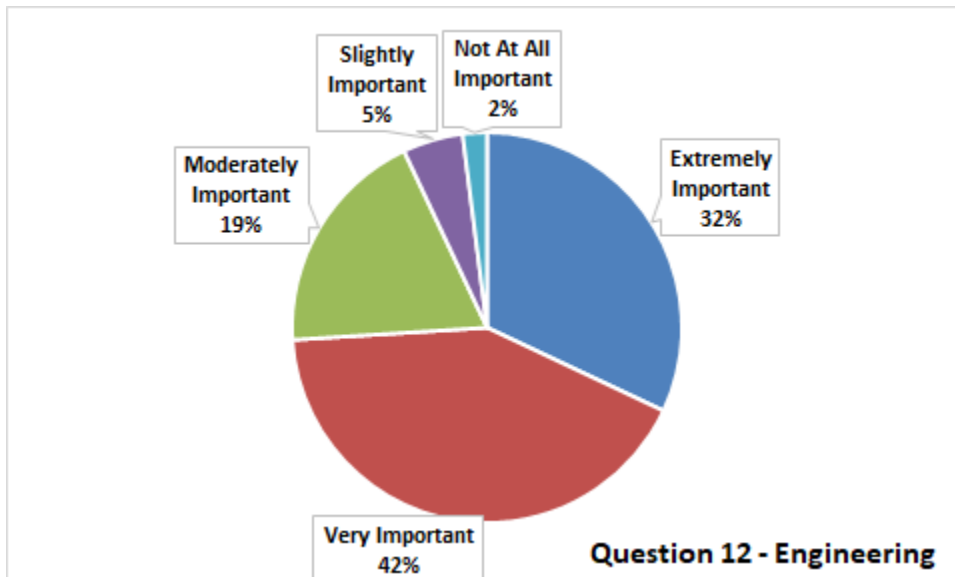
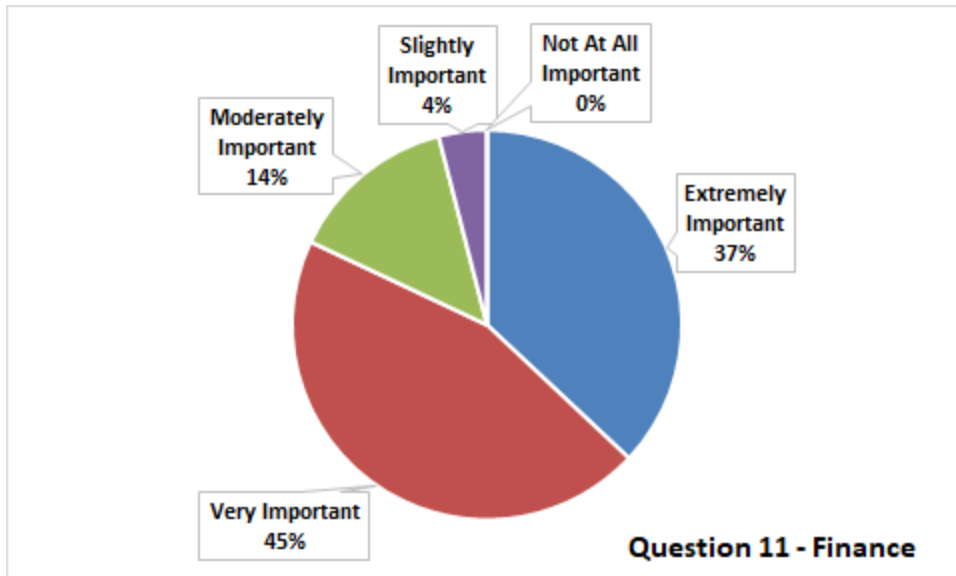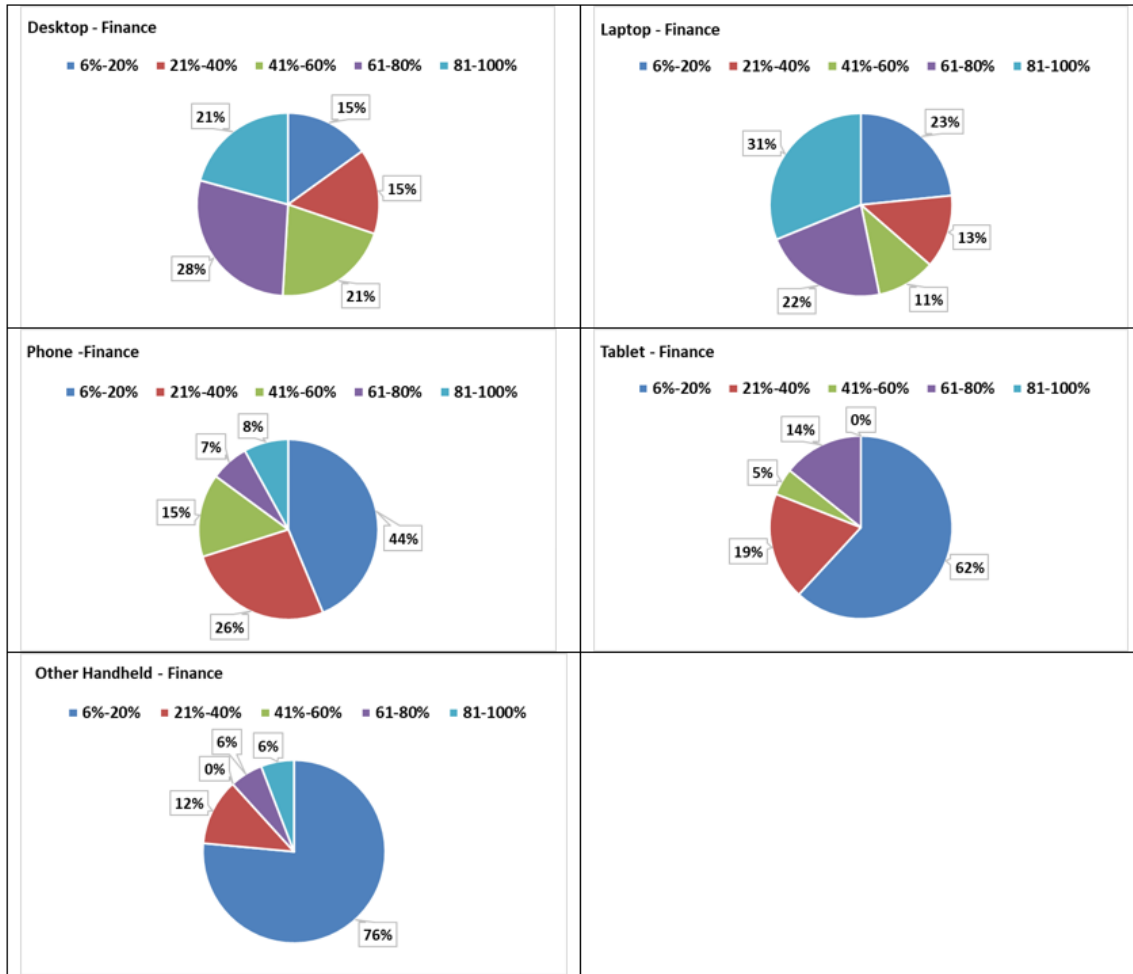*Appendix A: Figure 5. Writing and career advancement - Engineers*

Desktop - Engineering
6%-20% 21%-40% 41%-60% 61-80% 81-100%
18%, 11%, 29%, 20%, 22%

Laptop - Engineering
6%-20% 21%-40% 41%-60% 61-80% 81-100%
21%, 16%, 18%, 21%, 24%

Phone - Engineering
6%-20% 21%-40% 41%-60% 61-80% 81-100%
44%, 30%, 16%, 6%, 4%

Tablet - Engineering
6%-20% 21%-40% 41%-60% 61-80% 81-100%
65%, 10%, 15%, 10%, 0%

Other Handheld - Engineering
6%-20% 21%-40% 41%-60% 61-80% 81-100%
69%, 23%, 0%, 8%

Appendix A: Figure 6. Percentage of work week spent communicating with devices - Engineers

Finance

This group comprises 11% of our database, and includes professionals in the fields of banking and accounting. Finance professionals spend 32% of their time writing on the job, and they spend 17% of collaborating to produce documents.

Interestingly, finance professionals spend the least amount of time (9%) in comparison to other professional fields communicating internationally.

Appendix A: Figure 7. Writing quality and job performance - Finance Professionals
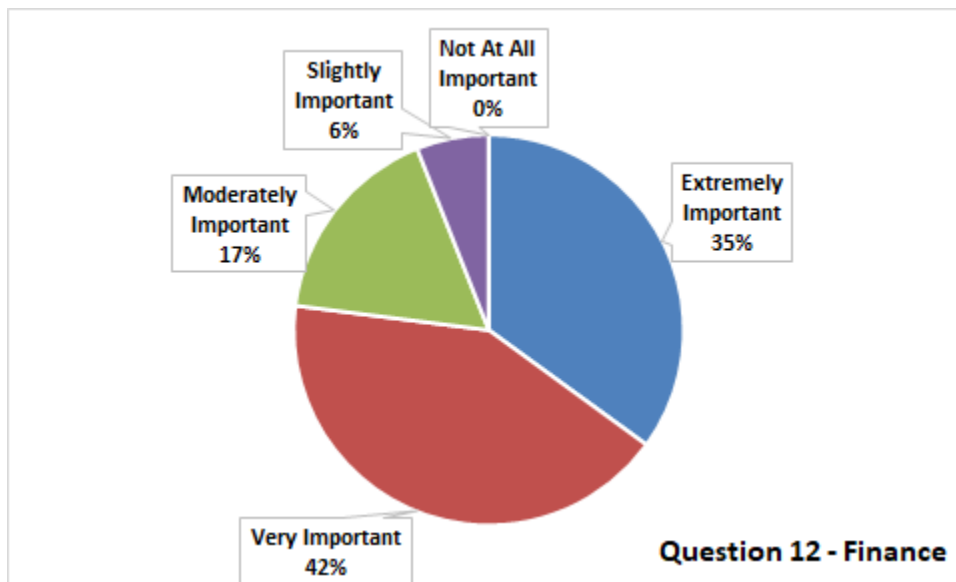
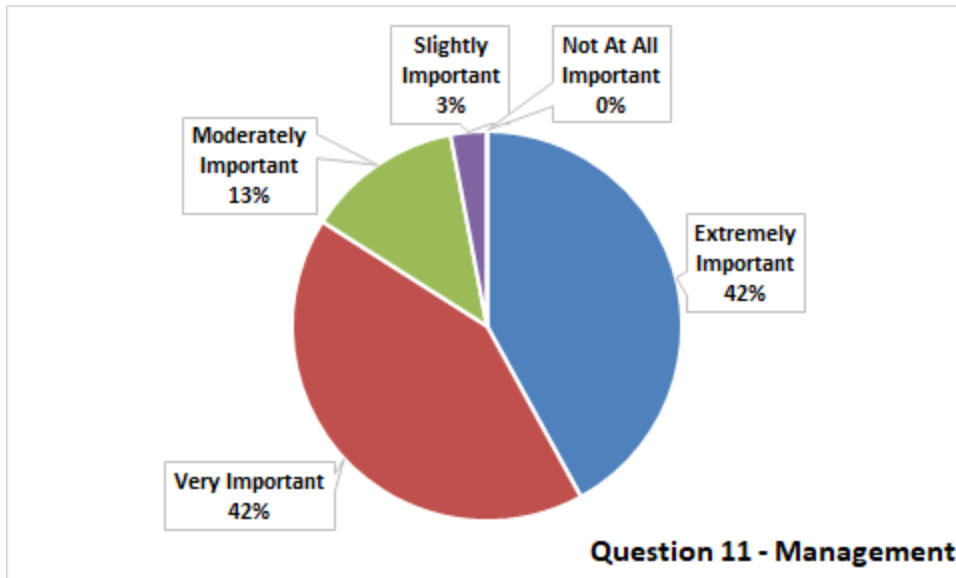*Appendix A: Figure 8. Writing and career advancement - Finance Professionals*

Desktop - Finance
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
21% | 15%
15%
21%
28%

Laptop - Finance
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
23%
31%
13%
22% | 11%

Phone -Finance
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
8%
7%
15%
44%
26%

Tablet - Finance
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
14% | 0%
5%
19%
62%

Other Handheld - Finance
■ 6%-20% ■ 21%-40% ■ 41%-60% ■ 61%-80% ■ 81-100%
6% | 6%
0%
12%
76%

Appendix A: Figure 9. Percentage of work week spent communicating with devices - Finance Professionals

Management

Managers make up 15% of the professionals surveyed. They spend 38% of their time writing, which is above the average for other professions.

Managers spend the most time collaborating to produce writing than the other fields (24%), and they are the second highest by field in time spent globally communicating 16%). This is an increase from 10% five years ago.

Appendix A: Figure 10. Writing quality and job performance - Management Professionals
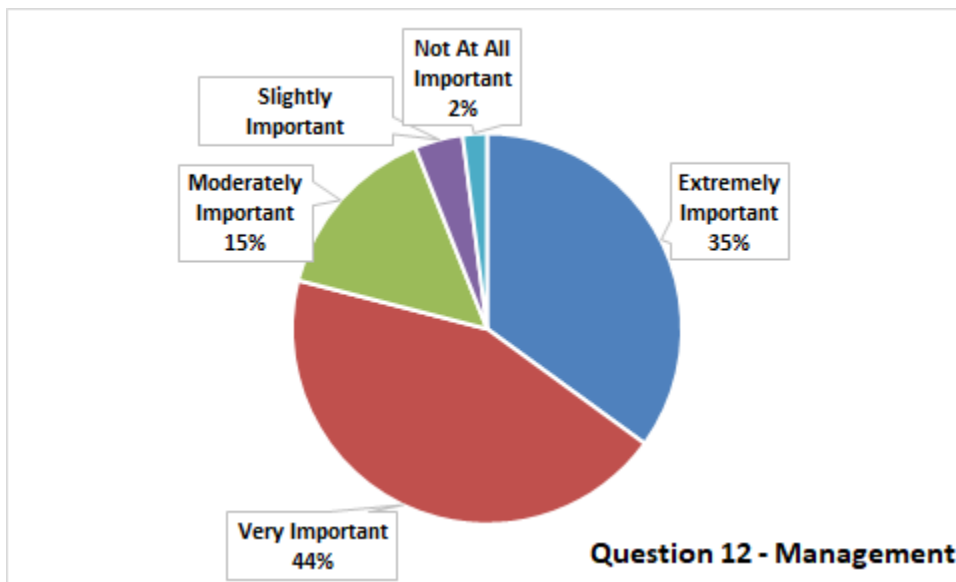
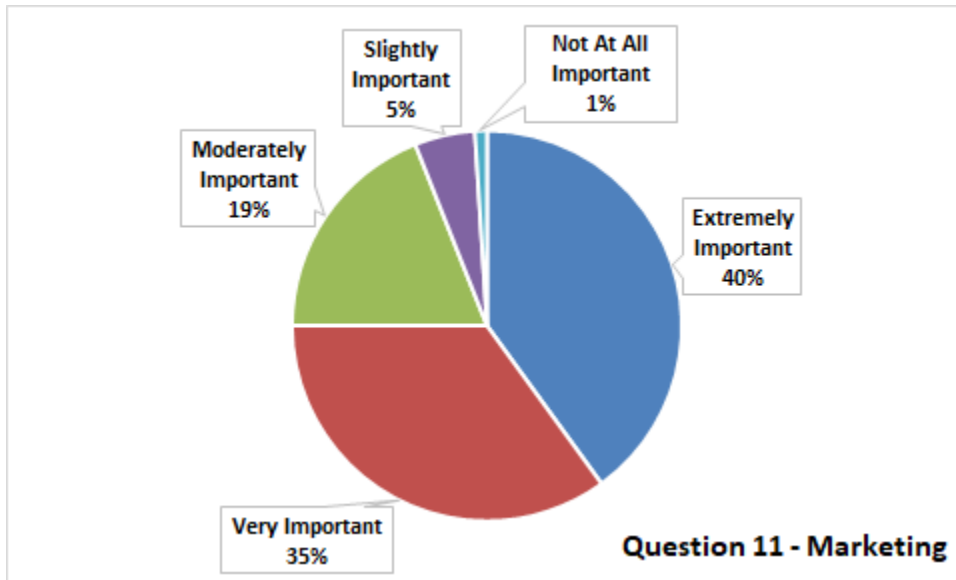*Appendix A: Figure 11. Writing and career advancement - Management Professionals*
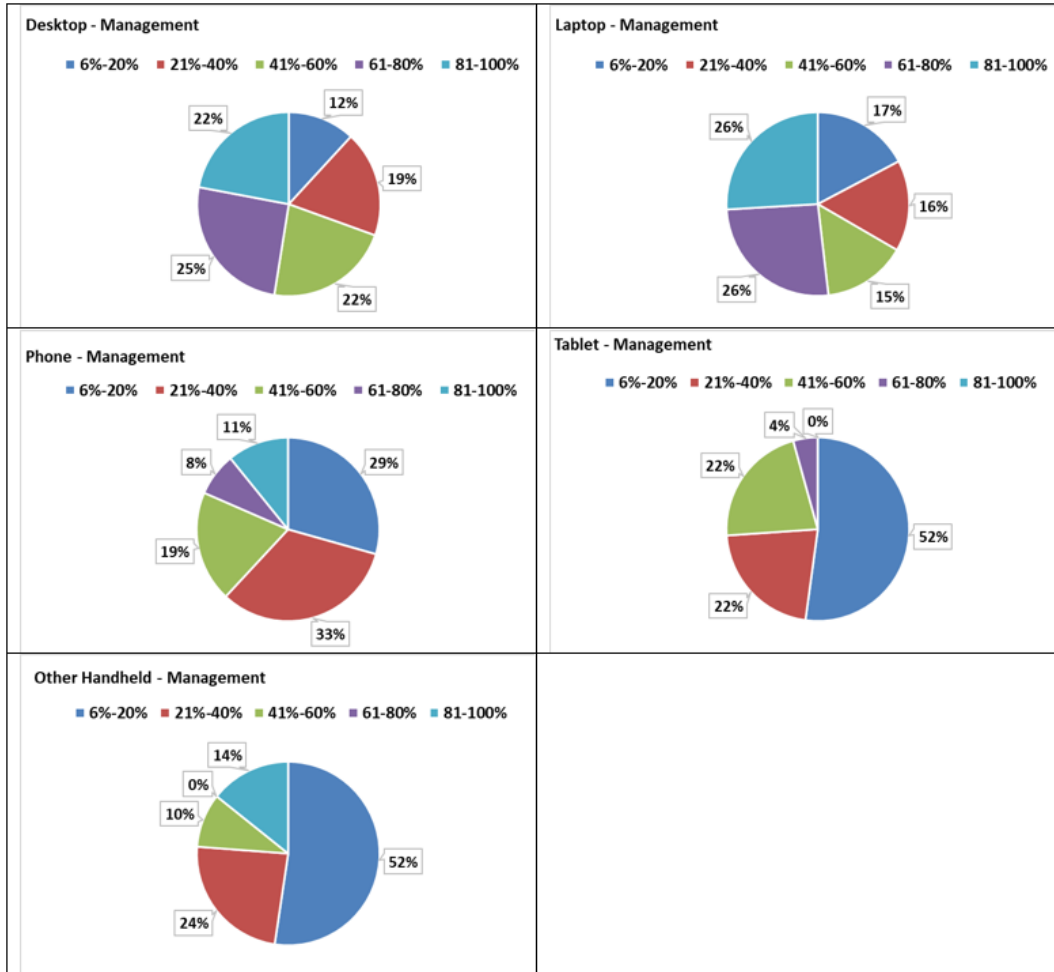
Appendix A: Figure 12. Percentage of work week spent communicating with devices - Management Professionals

Marketing/Sales

The marketing and sales professionals in our survey composed 11% of our database, and they spend the most time, 42%, writing on the job compared to other professionals.

Marketing and sales personnel collaborate 23% of their time writing, which is second to managers who collaborated the most out of all professionals.

International communication by marketing professionals is slightly lower than the overall average with 11% involved with global writing or speaking tasks. From past survey data, marketing professionals indicate an increasing trend in communicating globally from 6% ten years ago to 7% five years ago.

Appendix A: Figure 13. Writing quality and job performance - Marketing Professionals
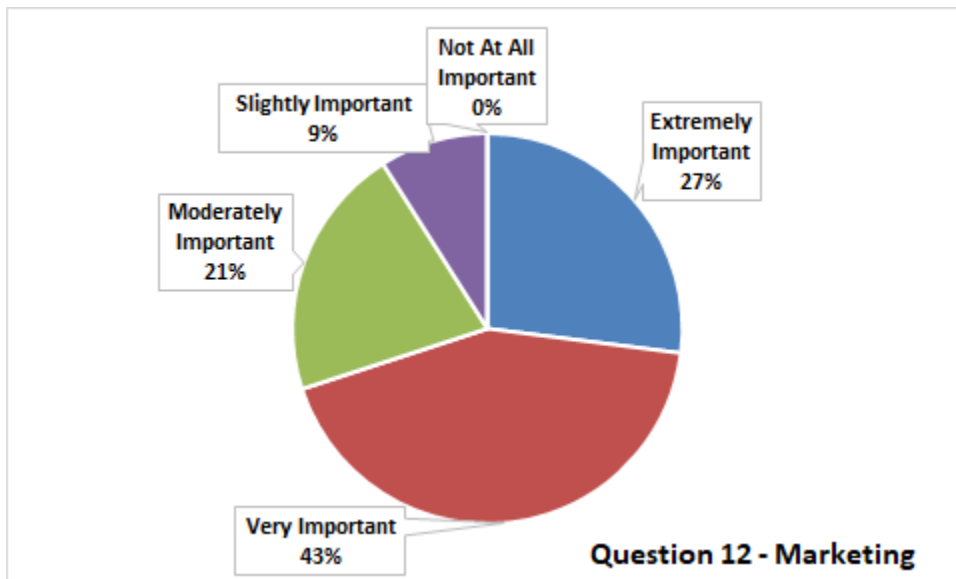
Appendix A: Figure 14. Writing and career advancement - Marketing Professionals
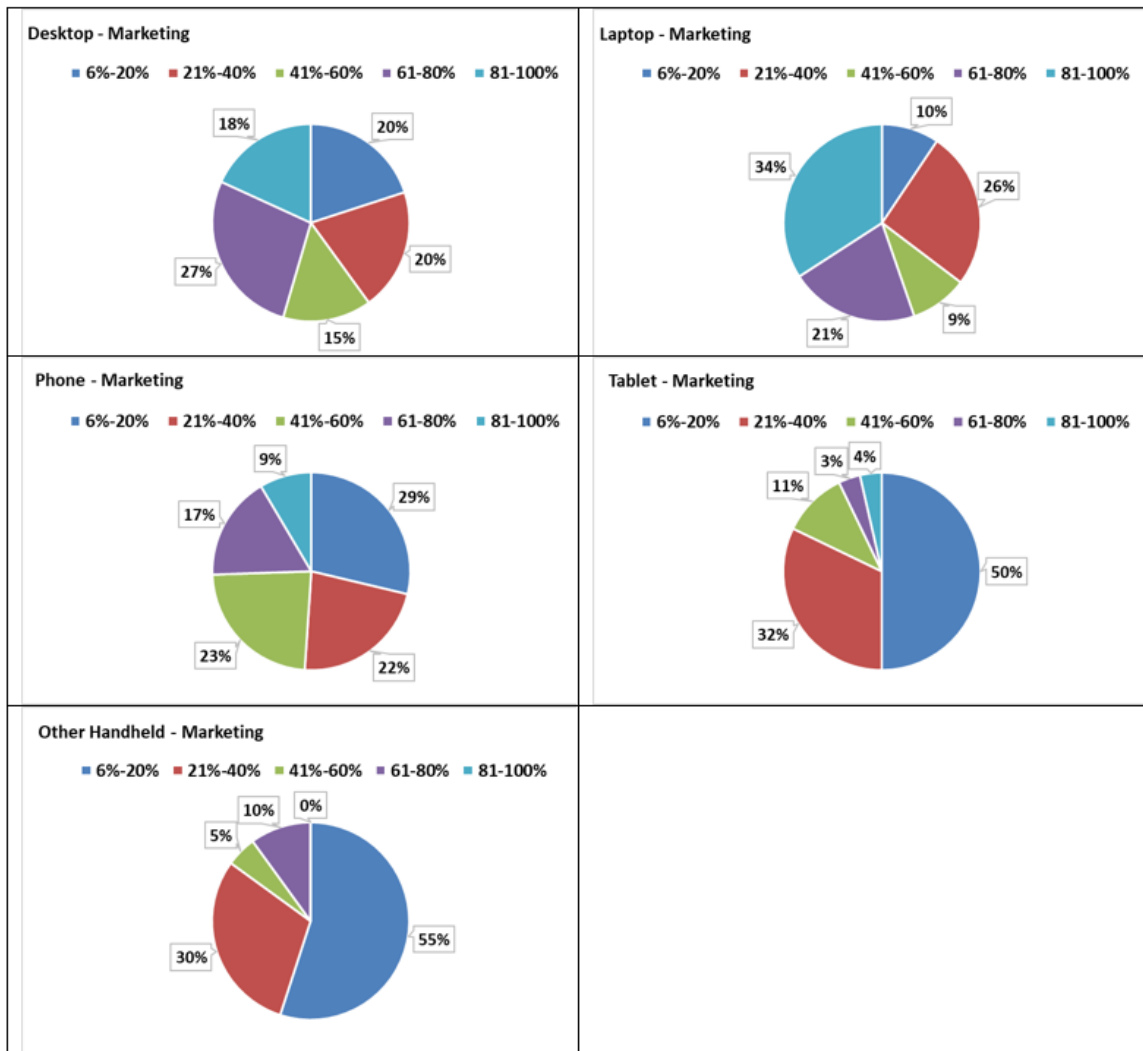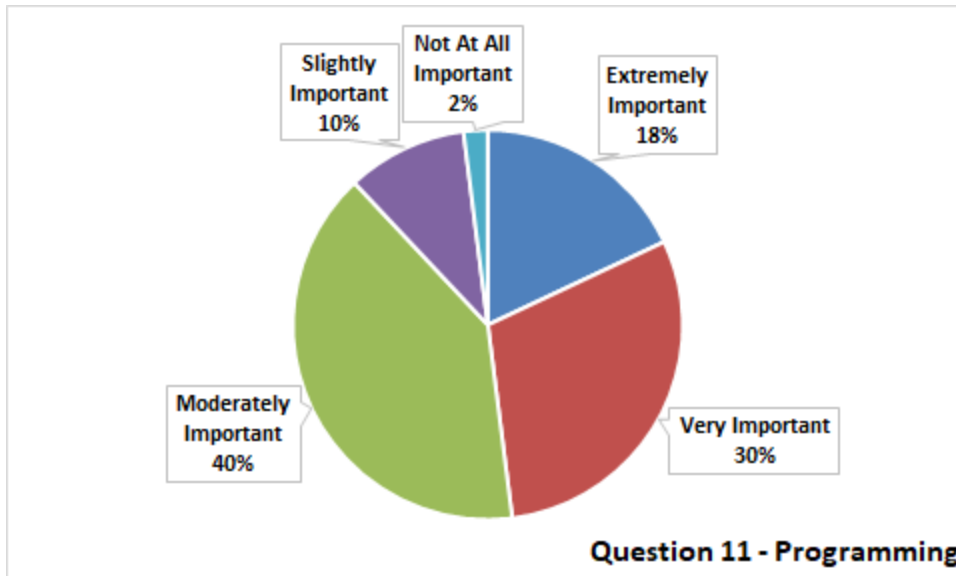
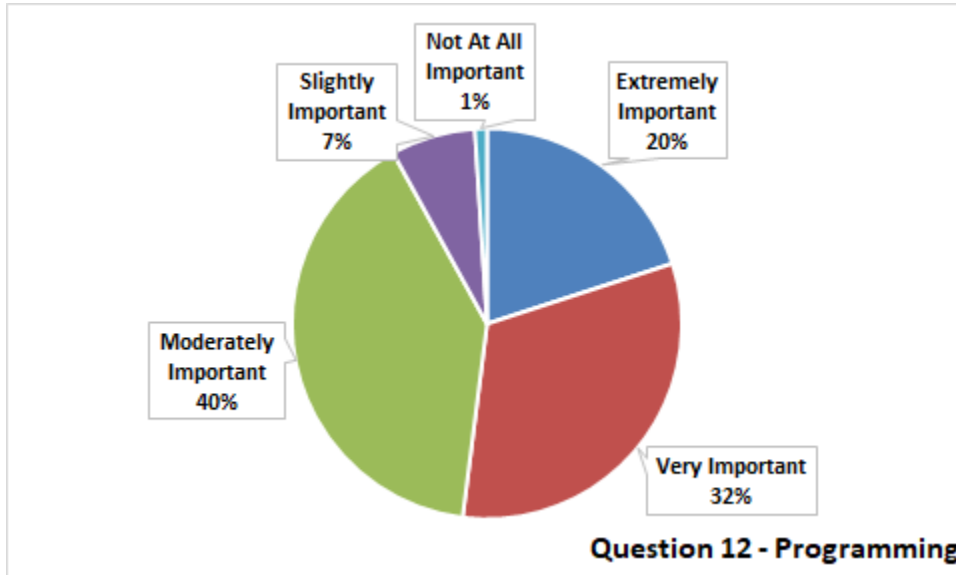*Appendix A: Figure 15. Percentage of work week spent communicating with devices - Marketing Professionals*

Programming

Programmers represent 7% of our database, and on average they spend the least amount to time writing on the job (26%). Programmers also engage in collaborative writing less frequently than other professions with 12%, which is below the average of 18.42%.
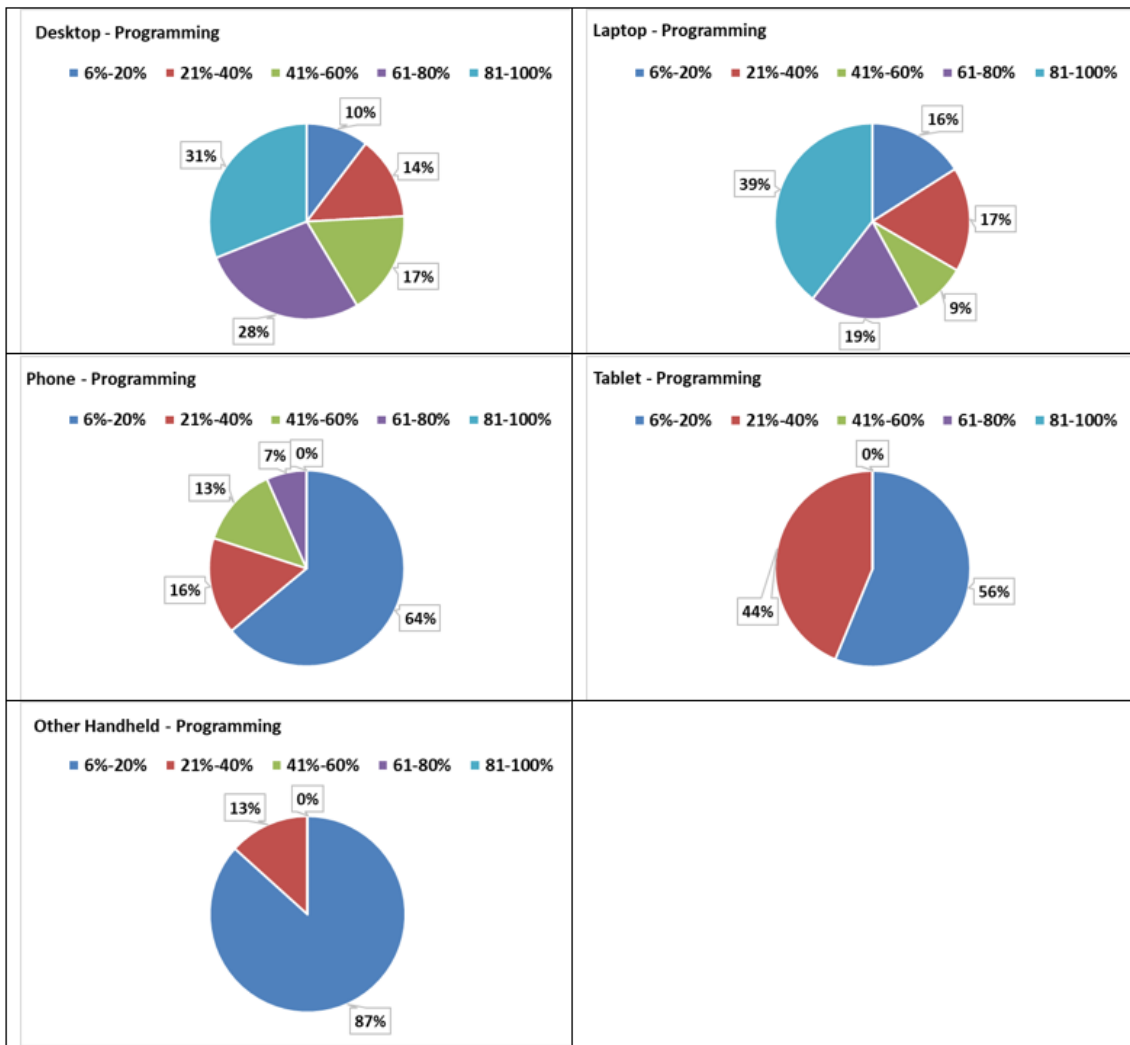
Of all the professions, programmers communicate the most internationally. 18% indicate that they engage in global communication, and this is a marked increase from five years ago with programmers indicating 8% of their time communicating internationally.

Question 11 - Programming

- Not At All Important 2%
- Slightly Important 10%
- Extremely Important 18%
- Very Important 30%
- Moderately Important 40%

Appendix A: Figure 16. Writing quality and job performance - Programmers

Question 12 - Programming

- Not At All Important 1%
- Slightly Important 7%
- Extremely Important 20%
- Very Important 32%
- Moderately Important 40%

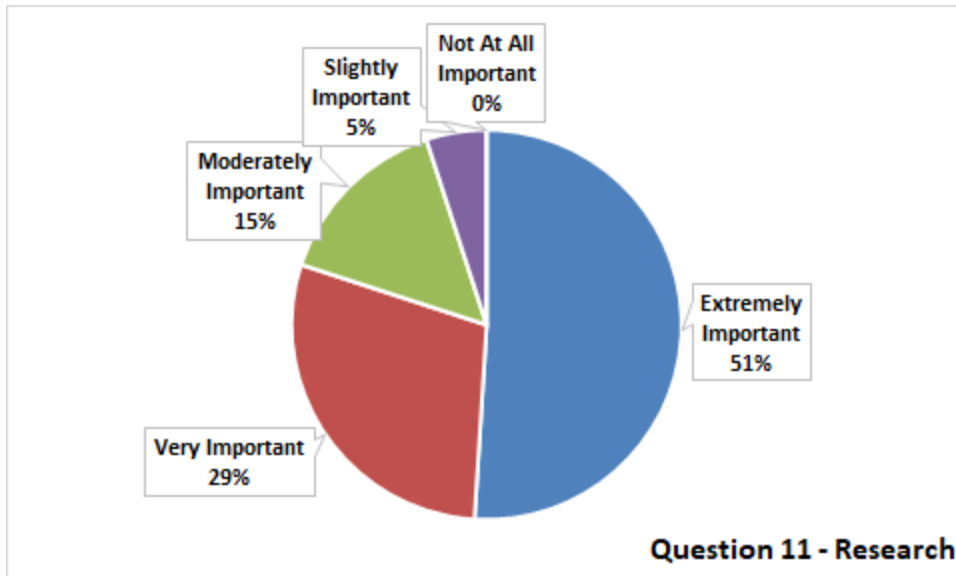*Appendix A: Figure 17. Writing and career advancement - Programmers*

Appendix A: Figure 18. Percentage of work week spent communicating with devices - Programmers
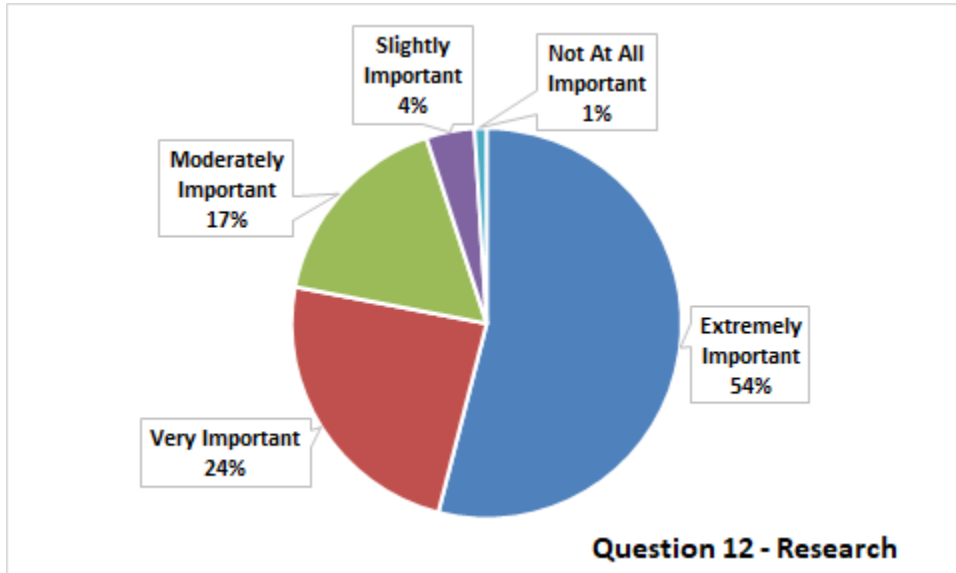
Research

The research professionals in our sample work in private, public, and academic laboratories, where their primary responsibilities involve research. Researchers represent 25% of our database.

On average, researchers indicate they spend 30% of their time writing on the job, which is slightly lower than the overall average. However, they indicate a slightly higher average for collaborative writing (19%) and international communication (14%), and this is consistent with the findings from five years ago.

Appendix A: Figure 19. Writing quality and job performance - Researchers

Appendix A: Figure 20. Writing and career advancement - Researchers

Desktop - Research
- 6%-20%: 23%
- 21%-40%: 23%
- 41%-60%: 16%
- 61%-80%: 23%
- 81-100%: 15%

Laptop - Research
- 6%-20%: 12%
- 21%-40%: 22%
- 41%-60%: 20%
- 61%-80%: 21%
- 81-100%: 25%

Phone - Research
- 6%-20%: 54%
- 21%-40%: 25%
- 41%-60%: 10%
- 61%-80%: 9%
- 81-100%: 2%

Tablet - Research
- 6%-20%: 82%
- 21%-40%: 18%
- 41%-60%: 0%

Other Handheld - Research
- 6%-20%: 88%
- 21%-40%: 0%
- 41%-60%: 12%

Appendix A: Figure 21. Percentage of work week spent communicating with devices - Researchers

Appendix B Survey Questionnaire & Interview Questions

Communication in the Workplace Questionnaire

Communication in the Workplace Questionnaire: Thank you for participating in this Communication in the Workplace survey. Your answers will help the administrators and faculty of the North Carolina State University Professional Writing Program assess and revise their curriculum. The survey consists of 19 questions and should take approximately 10-15 minutes to complete.

Q1 What is your job title?

Q2 What is your field?
- Education
- Engineering
- Finance, Accounting, Banking
- Management
- Marketing/Sales
- Programming
- Research
- Other

Q3 What is your company name?

Q4 How large is your company?
- Less than 50
- 50-100
- 101-500
- More than 500

Q5 Which best describes your company?
- Private organization
- Public organization

Q6 What degrees do you have?
- B.A.
- B.S.
- M.A.
- M.S.
- M.B.A.
- J.D.
- Ph.D/Ed.D/M.D.

Q7 List the degree(s), institution(s), and year(s) of graduation

Q8 Did you take a college course in technical, business, or scientific writing that was designed to prepare you for writing on the job?
- Yes
- No

Q9 Was the course required?
- Yes
- No

Q10 Are oral and written communication parts of your performance appraisal?
- Yes
- No

Q11 How important is the quality of your writing for the performance of your job?
- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q12 How important is your writing to your career advancement?
- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q14 What percentage of your work week do you spend writing (e.g., planning drafting, revising)?

Q15 What percentage of your work week do you spend working with others to plan and write documents?

Q16 What percentage of your work week do you spend working communicating with people from other countries?

Q17 Which forms of written communication do you use for the following purpose?

	Written communication with supervisors	Written communication with coworkers	Written communication with clients/ customers	Written communication with other stakeholders

	Pre-ferred	Accept-able	Not Used	Pre-ferred	Accept-able	Not Used	Pre-ferred	Accept-able	Not Used	Pre-ferred	Accept-able	Not Used
Email												
Social media												
Chat/IM /Text messages												
Short internal word-process-ed docs (e.g., memos)												
Short external word-process-ed docs (e.g., letters)												
Long word-process-ed docs (e.g., reports, pro-posals)												

Q18 Which forms of oral communication do you use for the following purpose?

	Oral communication with supervisors			Oral communication with coworkers			Oral communication with clients/ customers			Oral communication with other stakeholders		
	Pre-ferred	Accept-able	Not Used	Pre-ferred	Accept-able	Not Used	Pre-ferred	Accept-able	Not Used	Pre-ferred	Accept-able	Not Used
In Person												
Phone												
Telecon-ferences												

Q19 What percentage of your work week do you spend communicating with the following devices? Your values need not add up to 100%:

	Desktop	Laptop	Tablet	Phone	Other Handheld
0-5%					
6-10%					
11-20%					
21-30%					
31-40%					
41-50%					
51-60%					
61-70%					
71-80%					
81-90%					
91-100%					

Acknowledgements