Communication in the Workplace Report 2013

Preface

This report grows out of one of the most successful assignments in NC State's professional communication courses. The assignment asks students to interview someone who has a job they would like to have in five years about the writing and speaking tasks associated with that job.

Students write up the results of their interviews, including quotations from the professionals about their on-the-job communication practices. Often, students are surprised to discover how much time technical and business professionals spend writing each week.

Most of what students discover in these interviews confirms national survey results from the past 30 years, and from our own survey results over the past 17 years. However, the impact of first-hand information from a role model is far greater than that from a teacher or published text.

We have harnessed the power of large numbers three times before, during the spring semesters of 1996 and 2001 and the fall semester of 2006. This fourth survey conducted during the spring semester of 2012 provides a follow-up study. In all four semesters, faculty in the English Department coordinated their assignments so that the results of many interviews could be compiled and compared.

This assignment is not only a successful teaching strategy; it can also be a valuable source of information for instructors and curriculum planners as they try to keep up with the changing practices and problems of the workplace. We have found that when many students gather the same kind of information at the same time, we acquire information that has statistical power as well as anecdotal richness.

Dr. David Covington

Professional Writing Program Director

Communication in the Workplace Report 2013

Introduction

Why did we do this study?

One of the most frequent comments that employers make about college graduates is that their communication skills aren't adequate for the workplace. Faculty and administrators in most technical programs at NC State (as well as nationwide) have heard this complaint from their advisory boards and other industry contacts. But it is hard for curriculum designers and instructors to know why these complaints are being made and what they mean. Exactly what kinds of communication tasks can graduates of NC State expect to do in the workplace? How are electronic technologies and global economies affecting these tasks? What affects the quality and results of their communication—both oral and written? And how important is this component of their overall work responsibilities—and why?

The three courses in the English Department's Professional Writing Program (ENG 331, 332, and 333, which focus, respectively, on technical, business, and scientific communication) are a primary means of curricular response to the concerns of employers. Thus, those of us in the program realize the need to gather information about communication tasks in the workplaces to which students in these courses will go.

In 1996, 2001, and 2006 we did surveys very similar to this one, which began to answer these questions (The previous three reports are available at http://courses.ncsu.edu/eng331/common/resources/survey/index.htm

http://courses.ncsu.edu/eng331/common/resources/ciw2002/index.html

http://courses.ncsu.edu/eng331/common/resources/ciw2007/index.html).

These prior reports have proven very useful in our teaching and course planning. With each iteration, the results indicate that communication practices in the workplace change very quickly. Therefore, in 2012, we thought it would be worthwhile to conduct a new survey to see if we could track any changes and add to the prior database that we have created. These new results, as the 2006 results also did, confirm the importance of communication skills for another generation of students.

We hope this report will be useful to the NC State community. It can help us to understand the communication tasks students will face as they enter the workplace; it can also help us to address students' responsibilities not only to engage effectively in those tasks but also to improve workplace practices.

How did we do this study?

During the spring semester of 2012, faculty members and students in 27 sections of NC State's courses in technical, business, and scientific communication (ENG 331, ENG 332, and ENG 333) conducted a coordinated series of 625 interviews with working professionals that 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 (for both students and faculty) by asking students to interview someone with a job they would like to have in about five years. The data set was reduced for the quantitative analysis to 541 since we only included six fields, which are listed in the "Who responded to the survey?" section in this report.

The professionals responded to a structured questionnaire and commented informally about their workplace experience. A copy of the questionnaire is included in Appendix A. 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 on their interviews, providing us not only with the responses to the questionnaire but also with accounts of their discussion, which often included interesting verbatim quotations from those interviewed.

This report presents the quantitative results from the questionnaire and explores the implications of the discussions in the student reports. In Appendix B we explain the coding system used for compiling this qualitative information. We report means for the quantitative data in Appendix C. We also subjected the responses to a factor analysis and an analysis of variance to test for correlation and comparisons among items based on size of organizations and professionals' titles. These results are given in Appendix D. Finally, a list of the employers of all those interviewed is given in Appendix E.

What do professionals tell us about writing and speaking on the job?

Who responded to the survey?

(Questions 1-5)

We received 625 student reports of interviews for the qualitative data analysis. We reduced our database to 541 for the quantitative analysis since the focus for the data analysis was based on the following professions based on the respondents' job titles and descriptions of their workplace descriptions:

Education	51
Engineering	159
Finance, Accounting, and Banking	93
Management	86
Marketing and Sales	65
Programming	47
Research	40

This database is large enough for us to draw significant conclusions about differences in communication practices between professionals based on the quantitative data analysis that we conducted.

The majority of these professionals work for organizations with over 500 employees (57%), while 24% work for companies that employ fewer than 50 people, and 19% work for companies with 50–500 employees. Appendix E provides a complete list of the employers represented in our sample.

Thirty-one percent of the interviewees received their undergraduate degrees from NC State. The average year of graduation for this group was 2000.

What are the differing communication patterns seen in various sizes of organizations?

In the factor analysis (see Appendix D), no differences were seen between communication patterns of employees in companies with 51-500 employees, so we analyzed the data based on the following organization sizes:

- Fewer than 50
- 51-500
- More than 500

The percentage of the 541 professionals working in various sizes of organizations has not changed significantly from the study conducted in 2006. We found that overall, 24% of the professionals worked in companies with less than 50 employees, 19% worked in companies with 51-100 employees, and 57% worked in companies over 500 employees. This is consistent with the prior study conducted six years ago, with 20% of the professionals who worked in small companies, 21% who worked in companies with 51-500 employees, and 60% who worked in companies with over 500 employees.

Through the analysis of variance that we conducted (see Appendix D), we found that employees who work in organizations with more than 500 employees do less collaboration with other employees in writing and planning documents than employees in mid-sized companies (51-500).

One other significant finding is 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.

Information about professionals' communication practices in differing sizes of organizations is noted in the following sections of this report.

How do they spend their time writing at work?

We found that professionals spend 39% of their time writing on the job. This is a slight increase from six years ago when the mean was 34%. Figure 1 shows the time spent writing by differing professions. This indicates that workers still spend about a third of their work time writing, planning, reviewing, and revising documents. When asked what percentage of your time is spent working with others to plan and write documents, one professional noted,

"A lot… I have to work with other employees to determine what needs to be discussed."

The professionals as a group reported that 20% of their time on the job is spent collaborating with others to plan and write documents. This percentage is higher than the 15% from six years ago but it is the same as the percentage from 10 years ago.

From the statistical analysis, we found that writing long formal documents correlated significantly with professionals writing in collaboration, as well as the creation of external, short documents (see Appendix D). This also correlated with the time spent writing on the job.

One interesting finding was that professionals spend 39% of their time writing email, which has not changed significantly from six years ago (38%). Email is the most frequent form of written communication used. Other forms of hard copy documents are formal documents (24%), memos (16%), and letters (14%).

In the survey (see Appendix A), we asked professionals how much time they spent composing chat/IM/text messages, as well as blogs. Overall, professionals stated they spend 11% using Chat to communication with their peers. 4% stated that they use Blogs for professional communication. Since this data for these two categories

was skewed by some professionals entering 100% of their time in these fields, we cannot make any significant conclusions from these percentages.

Many of the respondents discussed the process of their writing on the job. Peer reviews were mentioned frequently. One engineer stated,

"…all work is peer reviewed. If it is going to a client, then it is peer reviewed several times."

In addition in the time spent for peer review, adapting to the expectations of the workplace was discussed as another part of the writing process. An engineer noted

"The class (ENG 331) was a good starting point, but from there you learn on the job and adapt."

One engineer shared,

"A lot of my time is spent condensing writing so that an employee can get the important information fast."

The impact of technology on the writing process was a topic that cropped up in the interviews across all professions. The positive effects of saving time and money are encapsulated in the following quote from a finance professional,

"Technology has completely revolutionized the way business is done, especially in my industry. Previously all documentation and contracts were done on paper. Due to the rapid progression of technology, contracts are now done online. Documents are signed, scanned, and sent. It is amazing to see a whole entire industry change the way business is done in a relatively short period of time... It is also easier to speed up the process of business with signed documents via PDF. There has been a concomitant explosion in available information and research resources through the use advanced searches, blogs, and easier access to experts. This has increased efficiency and productivity."

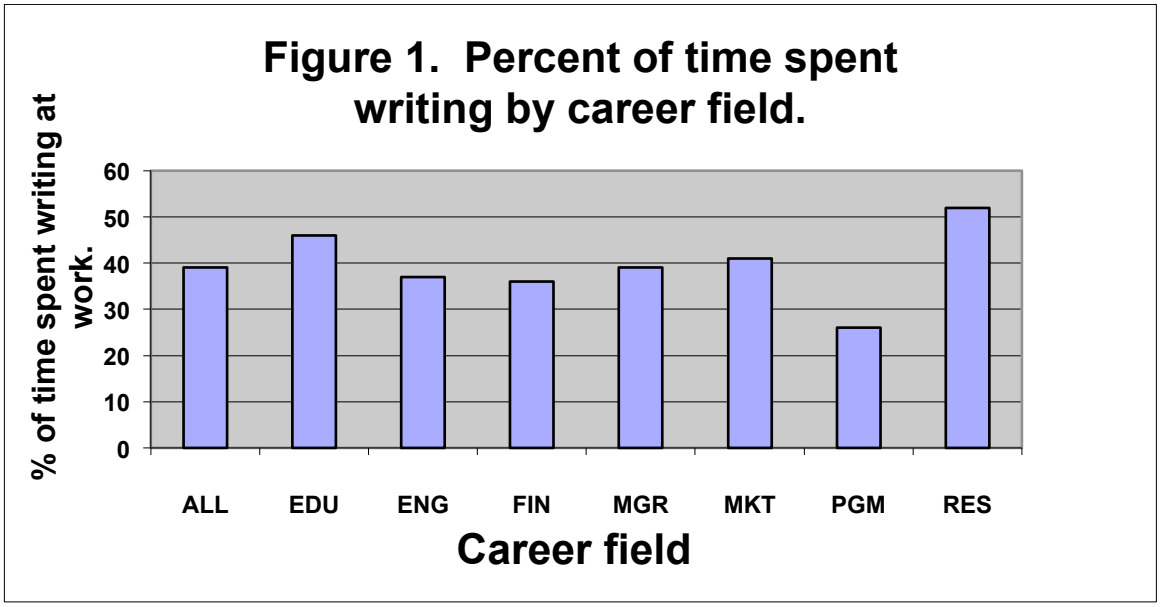
A manager added,

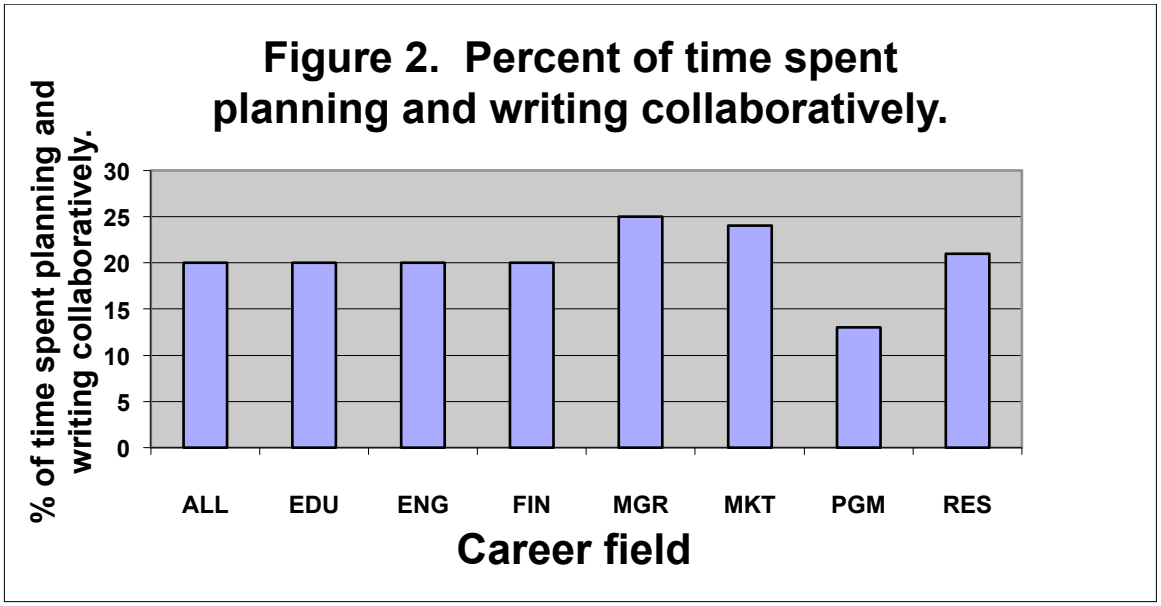
"The primary benefit from technology over the past five years is aiding in streamlining the process of my day-to-day tasks."

With the increasing use of email, instant messaging, and teleconferences within the home office and in the workplace, negative effects were also reported. One researcher said it best,

"I now have my cell phone and laptop with me constantly, so I am more available to communicate with work. This can be good and bad, since I no longer leave work at work."

Because writing itself is so important on the job, we compiled the following statistics and figures quantifying the significant amount of time that professionals spend writing on the job.:

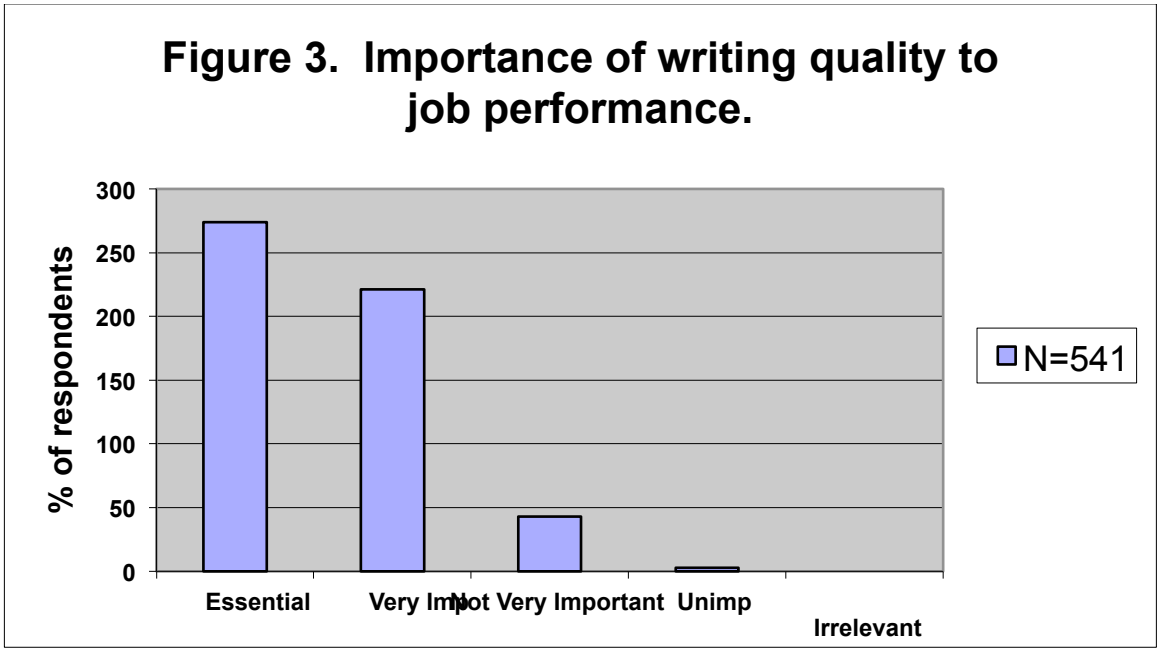




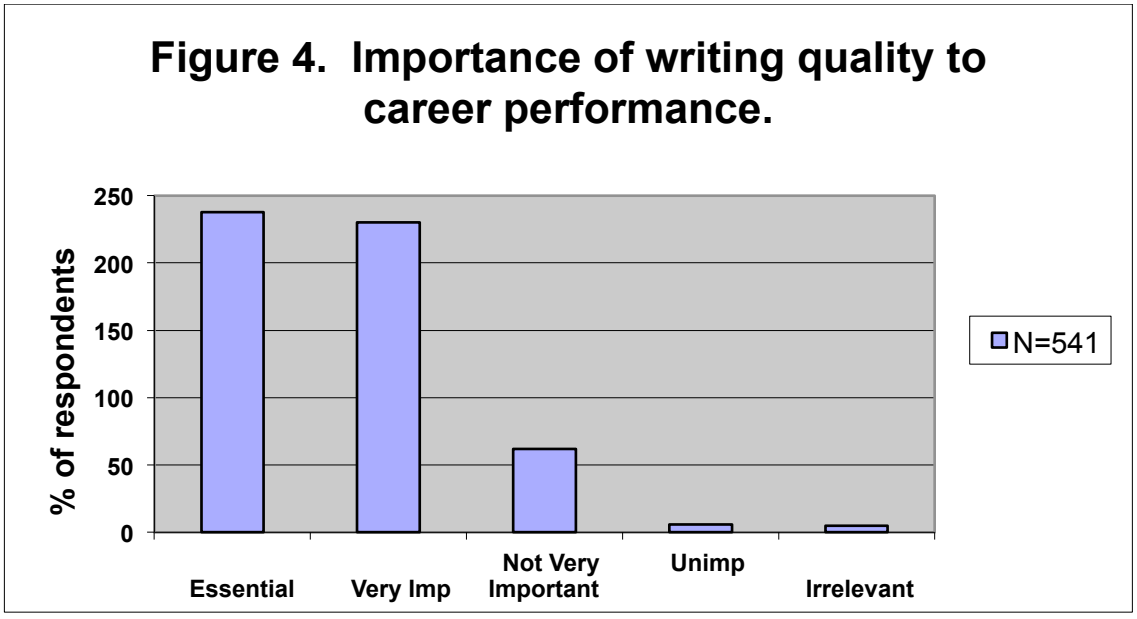
How important is their writing?

The majority of professionals interviewed (89%) indicated that oral and written communication were a part of their performance appraisals. When asked how important the quality of their writing is for the performance of their jobs, the respondents said it was either essential (51%) or very important (41%). These

percentages total 92% and are almost identical to six years ago with 93% of the professionals stating that writing quality was essential or very important for the evaluation of their job performance. Figure 3 shows the importance of writing quality to job performance overall, and by profession.



Professionals rated the importance of their writing to career performance as essential (44%), or very important (43%), and only a few (1%) said that it was irrelevant. Figure 4 shows this data.



When discussing the importance of writing, one finance professional noted,

"A [concisely written document] is vital for success, not only in my position, but throughout my entire company."

A marketing professional added,

"The intense pace of business in the retail industry leaves little time for mistakes. Therefore, clear and concise communication (formal or informal) ultimately makes things work more smoothly in this dynamic environment."

A scientist offered,

"It is important to be an effective writer in fisheries science because results and advice must be correctly conveyed in order for proper resource management to take place."

An engineer summed it up,

If you can't explain yourself professionally on paper, you won't get very far."

Do they communicate with people of other nations and cultures?

Seventy percent of the professionals surveyed indicated that they spend some percentage of their time communicating on the job with people from other countries. This is a little higher than six years ago with 64% of professionals saying that they communicate internationally with their peers and customers.

The analysis of variance of the survey data revealed that employees in companies with over 500 employees engage in significantly more international communication than employees in companies with fewer than 50 employees.

International communication also correlated with the use of Chat/IM/Text messages. These two variables were also significantly related in the study and factor analysis conducted six years ago.

Many professionals commented on the impact of technology on communication in the workplace and especially as it relates to global communication. One engineer expressed this change well,

"Teleconferencing has made international collaborations much easier."

When discussing international communication, many mentioned email as the primary form of international correspondence. An engineer stated,

"We work as a global team so there are a lot of emails about customers and what they want from our products."

While technology has made international communication easier, some respondents noted complications

"We get [international] emails… that are poorly translated and we kinda have to fill in the blanks sometimes as to what they mean. This can lead to a lot of miscommunication."

The global workplace offers advantages but also challenges. One engineer discussed the impact of the increasingly global workplace.

"When I was in school, we were competing with they guy down the street; now you are competing with the guy down the street and the guy overseas."

What forms of oral communication do these professionals use?

On the questionnaire, we asked the professionals to specify what percentage of their time was spent orally communicating either one-on-one or in group meetings. One-on-one communication included 36% in person and 25% on the phone. Group meetings consumed about a third of their work time (30%), and group teleconferences took 14% of their work time.

One interesting finding that is statistically significant showed that in companies with less than 50 employees that Managers communicate more one-on-one in person than other professionals, and Programmers communicate less than all of the other professions.

The factor analysis (see Appendix D) showed a strong correlation between oral communication on the phone, group teleconferences, and email. This finding matched what we found the study conducted six years ago. This suggests that both strong oral and written skills are used in conjunction, and that they are important for effective communication on the job.

Consistent with prior research and data, oral communication in group meetings and one-on-one in person correlates with the use of email.

From the interview responses, we can see a direct relationship between oral and written communication in the workplace. One engineer stated,

"The ability to verbally communicate is a vital skill. It is of equal importance as written communication. Often I am asked to produce a written document, then present it verbally."

Despite the ease of other forms of communication, oral communication is still highly valued. One manager reported,

"I will regularly talk to my boss over the phone a few times a week to keep him updated on what we're doing. The workers we have will also let me know if something is going on by calling me."

A researcher emphasized the importance of oral communication by saying,

"Without oral communication, I wouldn't have a job."

How is technology affecting the communication patterns of professionals?

We found that professionals use a variety of communication technologies including desktop computers, laptop computers, tablets, and the phone. It is not surprising that professionals significantly correlated the use of desktop and laptop computers. Professionals indicated that they spend 39% using a desktop computer and 36% using a laptop.

Only 6% indicated the use of a tablet for professional communication, but this data was skewed in the analysis of variance so further research needs to be conducted concerning the use of this technology for professional communication. We did not collect data concerning the use of tablets in the study conducted six years ago.

Twenty-nine percent of all professionals indicated that they spend time using the phone, which was a little higher than from six years ago with 22% indicating the time spent using the phone for professional communication.

Professionals shared their impressions of the benefits of technology in the workplace. An engineer stated**,**

"Smart phones have revolutionized field work. Being able to reference a document saved out in cyber space can really save you when you forget the print out at the office."

A manager described the changes in technology over time,

"We used to handwrite or type on a manual typewriter orders and mail them via USPS to vendors. We would handwrite or type on a manual typewriter formal letters to customers and mail them via USPS to customers. Then, when fax machines became all the rage, we began to fax orders to the vendors and letters to customers. Now, we email almost everything, except when we want to make a big impression."

Communication abilities of increasingly smarter 'smart phones' and other devices were noted by professionals as shown in these two quotes by two different managers,

"Well, I would say over the past five years, texting has become a lot more prevalent, and for me, my smartphone has only been for the past year and a half. I'm more up-to-date on emails, it seems like I'm always ready to help someone that needs it immediately. A lot of people call if they need to, but often they'll text."

"Instead of waiting on the mailing process we can now jump on a tablet, laptop, or smart phone and talk to one another face to face."

A researcher went so far as to proclaim,

"The iPhone has changed my life."

Although many noted positive changes with technology, drawbacks and limitations do exists. An educator stated,

"Technology allows you to do things more easily, but the hard work, putting together sentences to convey the work, hasn't really changed."

As one engineer noted,

"Sometimes it is better to deliver a message face to face because you cannot include facial expressions on an email or IM."

Another drawback of email is the volume of messages sent and received. The multitude of emails was mentioned as an issue. One finance professional stated,

"I write hundreds of emails per week. That said, I read hundreds each week, too, and that is a make-or-break thing for me. Good emails look good, bad emails look really bad."

In addition,

"Everyone is overworked. More than half of the emails around here are never more than skimmed, if that. The ability to take a daunting amount of important information and condense it down to the most important and relevant information is not only critical, but expected."

How did they learn to write at work?

Sixty percent of the respondents indicated that they completed a college course designed to prepare them for workplace communication, which is consistent from six years ago when 62% indicated that they completed a professional and writing course as undergraduates. Fifty-one percent said this class was required.

When asked how they learned to do the kinds of writing they do at work, respondents indicated that a combination of school and on-the-job training prepared them for effective professional communication. One researcher stated,

"I learned writing skills in high school and college composition classes, as well as through my experience on the job. One of the most useful aspects of my training was learning a variety of writing styles."

An engineer added that,

"…classes like this [ENG 331] can expose you to different types of writing, in reality the business world will have its own set of rules and expectations that you will have to adapt to."

Without discounting formal writing training, a manager identified the importance of learning communication conventions within organizations and specific fields.

"You really learn to write to your specific audience when you are on the job."

Whether the skills are learned in the classroom or on the job, the perception is that professional communication skills are an important part of preparation for the workplace. One manager stated,

"It sometimes shocks me how prepared most engineers are coming out of schools these days, but one of the things they are missing might be the most important thing… professionalism, whether it be verbal or written."

Were there significant differences among professional fields?

Education

This group comprises 9% of our database and consists primarily of professionals with teaching responsibilities.

Although these percentages did not stand out as significant in difference from the other professions, it is interesting to note that educators spend 20% of their time collaborating with others when planning and writing documents. They also spend 29% of their time producing formal documents, which is more time than they spend producing memos and letters.

Educators spend the least amount of time communicating on the phone (16%), as well as the least amount of time communicating in group teleconferences (8%).

From the qualitative data and educators' quotes, the respondents emphasized increased collaboration through technology.

"Using Google Docs, I and a colleague in a different state can look and edit the same document in real time and see the changes at both ends, and with Skype we can talk and see each other as we talk about the document."

Another theme is the importance of peer review in the field of education. These quotes from two different educators mention the importance of peer review.

"Peer-reviews are vital to success."

"It was extremely painful having someone take [everything I had worked on] apart, but I would rather have my peers tear me to shreds than the review committee."

When giving advice to future educators, one educator said,

"Read good papers to learn how others write, keep writing, and keep getting feedback."

Some respondents noted the link between their field and research funding. One educator stated,

"If you don't sell your idea, it won't get funded."

Another wrote,

"Publications are currency."

Educators' audiences and documents are related to their research and classroom responsibilities.

Audiences
Students
Peers
Managers
Editors
Funding approvers

Documents
Bi-annual progress reports
Education and grant proposals
Emails
PowerPoint
Proposals
Recommendation letters
Research papers
Teaching materials
Technical reports
Textbooks

Engineering

Twenty-nine percent of the professionals in our survey were engineers. They also indicated they spend 37% of their time writing, which is a little higher than reported six years ago (32%).

Interestingly, engineers reported that writing quality was essential to their job performance and career performance, which was more than any other professional group. They indicated that they work in organizations with over 500 employees (77%), which was also the highest percentage of all the professional groups except for researchers.

The balance of their writing time is divided into producing the following documents: emails (36%), letters (12%), memos (15%), and instant messaging (9%). The time that they spend writing formal documents remained the same from six years ago (23%). The results did indicate that engineers use blogs less than the other professionals.

Engineers were close to the mean of all of the professions in the time they communicate orally on the job: one-on-one in person (36%), one-on-one on the phone (23%), group meetings (29%), group teleconferences (16%).

Concerning international communication, engineers reported spending 10% of their time communicating with those from other nations, which is the same amount as the mean for all professions.

The engineers in our survey were clear about the hazards of poor communication skills. One engineer noted that,

"Ineffective writing in our work can lead to cost over runs, delays in construction, poor installation, improper equipment and a system that does not operate properly."

These quotes from other respondents also emphasize how an engineer's writing skills affect the company's bottom line:

"A project that is completed on time and budget is largely due to the [specifications document] being understandable."

"An ineffective document may result in a faulty installation or not meeting regulatory requirement, which can potentially have significant consequences."

"Effective writing gets money; poor writing does not."

"In the long run, a series of ineffective writing will lead to slower production which is expensive."

The engineers' comments also underscored the variety of communication technologies used in their workplaces: wikis, mobile phones, smart phones, video conferences, email, chat, text, and instant messaging. One engineer reflected on choice of technology used to communicate in place of oral communication,

"Emails are extremely dangerous. Many people rely on them way too often. Also a lot of times they can be misconstrued and create conflict due to an interpreted offensive or attacking tone of voice that's not meant to be portrayed. Sometimes its much better to just talk in person or on the phone."

Audiences
Suppliers
Managers
Senior executives
Clients
Corporate board members
Occupational Safety and Health Administration (OSHA)
Environmental Protection Agency (EPA)

Documents

Adverse conditions investigations
Audits
Blogs
Business letters
Conference papers
Design proposals
Test cases
Email
Employee reviews
Evaluations
Exposure assessment reports
Functional specifications
Install instructions
Journals
Post mortem reports
PowerPoint
Procedures
Product requirement specifications
Proposals
Reports
RFP
Safety manuals
Scheduling
Software requirements specifications
Technical manuals
Technical papers for publication
Test reports
Tweets
White papers
Wikis

Finance

This group represents 17% of our database. Most finance professionals work in organizations with over 500 employees (66%).

These professionals spend over a third of their time writing (36%), which is the amount reported in our study six years ago. Of that writing time, 41% is spent composing emails. The rest of their writing time is divided between formal documents (21%), memos (18%), instant messaging (12%), and blogs (3%). As for letter writing, finance professionals report spending 14% of their time these documents, which matches the overall mean for all of the professions.

Finance professionals spend the following percentage of their time communicating orally on the job: one-on-one in person (37%), one-on-one on the phone (28%), group meetings (31%), group teleconferences (19%).

They also reported spending 11% of their time communicating with those from other nations.

In their comments and quotes, finance professionals emphasized the importance of writing to their jobs. One finance professional said this,

"Team members who do not communicate effectively and efficiently through email, reports, or updates generally will not succeed in this industry."

Another added,

"Creating a communication a client can understand is paramount to success."

The next four quotes emphasize the cost of ineffective communication in finance,

"Ineffective writing is noticed, and when the documents requested have incorrect wording/ineffective writing, it is difficult to report those documents to examiners. In some instances, it causes the audit department to question the ability of the person's work, if their writing is not ideal."

"Investors do not want to leave their hard-earned money with a hedge fund manager who constantly writes incoherently, sometimes even regardless of the returns he or she may produce."

"Vague and confusing documents could cause partners to make poor investment choices."

"You never know who will receive the email; it could eventually reach the head of my department."

Finance professionals had much to say, too, about the impact of technology on their organizations and work habits. Most lauded the speed and efficiency that technologies like email, smart phones, and web cams have brought to workplace communication.

"Timing is everything when waiting on a signature and a document and now it's done the same day, making transaction turnaround time much less than in the past. The new cell phones, like the iPhone, have made communicating at work and responding to emails a breeze whether at the desk or on the road."

Another finance professional specifically pointed to the advantage of using email communication.

"I probably email my leading analyst over ten times everyday, and his cube couldn't be more than 30 feet from my office…its just easier that way; everything is saved and easy to pull up when you need it again. You just don't have that luxury through verbal conversation."

However, others noted the problems these technologies bring. One respondent stated,

"The most frustrating part of communicating through email is trying not to be offended by tone and grammatical errors."

Audiences
Clients
Internal Revenue Service
Subordinates
Managers
Senior-level executives
Financial institutions
Accountants
Coworkers

Documents
Annual reports
Asset acquisition reports
Budget projections
Business reviews
Contracts
Directions
Audit memos and opinions
Memos
Letters to clients, vendors, and regulatory agencies
Financial analysis reports
Auditor's report letters
Policies
Testing procedures, objectives, results, and conclusions
Loan comments and commitment letters
Interview and case reports
Employee evaluations
Email
Expense reports and forecasts
IM
KPI
Performance appraisals
PowerPoint
Profit and Loss reports
Project plan
Proposals
Text messages

Management

Managers comprised 16% of our sample. They were more equally distributed than the other professionals working in differing sizes of organizations: Twenty-nine percent in organizations with fewer than 50 employees, 12% in organizations with 51-500 employees, and 59% in those with over 500 employees.

In this survey, managers reported spending 39% of their time writing on the job. They indicated the highest percentage of writing collaboratively than all of the other professionals (25%).

Their time spent writing memos (21%) and letters (18%) was more than the other professionals' time spent writing these documents. They spend 21% of their time writing formal documents, as well as 13% instant messaging, and 4% using blogs. From the statistical analysis, we found that managers communicate significantly more using email than researchers and engineers (46%).

Managers spend more time communicating orally than the mean amount of time for all of the other professions, except for group meetings in person where marketing professionals indicated the highest percentage.

Oral Communication Type	Managers' Percentage of Time	Mean for All Professions
One-on-one in person	46%	36%
One-on-one by phone	38%	25%
Group meetings in person	35%	30%
Teleconferences	18%	14%

From the analysis of variance, we found that managers and marketing professionals communicate significantly more using the phone than all of the other professions.

Managers matched the mean of all professions (10%) for the time they indicated that they spend communicating with people from other nations.

Good communication skills, written and oral, are critical to being a successful manager, according to the comments from those professionals in our survey. One manager said that communication between employees and clients are crucial for meeting deadlines. Ineffective writing is cited as costing money or credibility. One manager said,

"Generally ineffective communication causes many problems very fast; those problems generally lead to more substantial problems. Ineffective communication is probably one of the top three reasons for termination."

Another manager stated,

"When employees read and follow the notes I provide, it helps ensure better quality service, a safer work environment, and all around easier task management."

Another manager expressed,

"You can have the best project in the world, but if you can't illustrate it to the right people, it may never happen."

Managers also emphasized the importance of effective oral communication, from PowerPoint presentations for senior management to conversations (face to face and virtual) with colleagues. One manager said,

"Instead of waiting on the mailing process, we can now jump on a tablet, laptop, or smartphone and talk to one another face to face."

Another issue the managers discussed was how email and other communication technologies have transformed their working lives.

"It is much easier to IM or email an individual due to advances in technology than to miss a phone call or to try to track the individual down."

While managers appreciate the efficiency technology brings to communication, one manager commented that poorly written emails were ***"very distracting"*** and that they can ***"affect her ability to work with the person and her impression of them."***

Audiences

Clients
Senior executives
Lenders
Account executives
Other managers
Subordinates
Builders
Governmental agencies

Documents

Advertisements
Agenda
Annual reports
Audit finding reports
Benefit plan descriptions
Bid packages
Blogs
Brochures
Business plans
Capital funding requests
Contact trip reports
Contracts
Departmental policies
Email blasts
Emails
Employee evaluations
Explanation of purchase orders
Financial requests to county government
Formal letters
Grant reports
IM
Investment recommendations
Invoices
Job descriptions
Job schedules
Justifications of promotion
Letters of intent
Manuals
Market analyses
Marketing plans
Newsletters
Portfolio reviews
PowerPoint
PR
Procedural notes
Process documents
Product assessments
Project plans
Proposals
Proposals (internal and external)
Purchase order
Quarterly analysis Reports
Reviews
RFPs
RFQs
Risk management reports
Speeches
Spreadsheets
Statement of confidentiality
Status reports
Technical reports
Termination paperwork
Test plans
Texts
User specifications
Valuation reports
Web copy
Work plans

Marketing

The marketing and sales professionals in our survey composed 12% of our database. More marketing professionals work in organizations with fewer than 50 employees than all of the other professions (38%).

Marketers reported spending 41% of their time writing on the job. In addition, marketers spend more time writing email (52%) then the other professionals, which was the same finding from the study we conducted six years ago.

Marketing professionals also spend the most time text messaging (16%) and using blogs (9%) than all of the other professionals. They spend the following amount of their time writing the following documents: memos (20%), letters (18%), and formal documents (20%).

They spend the most time communicating orally in group meetings (38%), and the following amount of time communicating orally on the job: one-on-one in person (39%), one-on-one on the phone (33%), and group teleconferences (16%).

Marketing professionals spend the least amount of time communicating with people from other countries (7%) than all of the other professionals.

Throughout their comments, these marketing and sales professionals stressed the importance of writing skills, saying they were central to success in the field. As one respondent put it,

"Effective communication will keep projects on time."

One respondent emphasized the value of communication with this comment,

"If your see an email that is unprofessional, you don't even want to deal with that person."

Another marketing professional echoed the idea that in marketing and sales, poor writing carries a high cost,

"Typos make you less credible. Once mistakes are made, people tend not to care or come back."

One marketing director summed it all up with this comment,

"The intense pace of business in the retail industry leaves little time for mistakes. Therefore, clear and concise communication (formal or informal) ultimately makes things work more smoothly in this dynamic environment."

Oral communication skills were emphasized, too,

"Face to face communication provides you with the opportunity to more about your audience by their body language (and) inflection in the voice… they can see that you are actually listening to their point as well."

Like the other professions, marketing professionals appreciate the speed and efficiency that email, instant messaging, and other communication technologies bring. Said one respondent,

"The best way for them to communicate with me is through instant message or email."

Another marketing professional said,

"[Text messages] ***convey quick messages that need little context."***

Audiences
Managers
Clients
Prospects
General public
Senior executives

Documents
Action plans
Agendas
Brochures
Proposals
Contracts
Creative briefs
Flyers
Letters of interest
Licensing Proposals
Meeting minutes
Memos
Monthly newsletters
Newsletters
PowerPoint
Presentations
Press releases
Prospecting letter
Qualifications packages
Research reports
RFPs
Status reports
Technical reports
Weekly/Monthly sales forecast

Programming

Programmers represent 9% of our database. They primarily work in organizations with over than 500 employees (68%). Only 2% work in companies with 51-500 employees, which is the lowest percentage of all of the other professions. Programmers indicated the lowest percentage of writing quality being important to

their job performance (3%) and career advancement (3%) compared to the other professionals.

According to the survey, programmers spend 26% of their time writing, which was also lower than all of the other professions. They collaborate less than the other professionals (13%) for writing and planning documents.

Most of their time is spent writing electronically through emails (37%). They spend 14% instant messaging, as well as 4% using blogs. They spend the least amount of time writing memos (10%) and letters (7%) than the other professionals. Our results indicate that programmers spend 15% of their time writing formal documents.

Programmers, as well as researchers, spend less of their time communicating orally on the job: one-on-one in person (27%), one-on-one on the phone (19%), group meetings in person (25%), and group teleconferences (11%).

Programmers indicated that they only spend 8% of their time communicating with people from other countries. This finding differs from the finding six years ago where programmers significantly communicated internationally more than all other professionals (20%). However, the respondents still indicated the importance of technology for communicating internationally when needed.

"Talks on a chat system can take place between employees who can be located merely across the cubicle or a participant of the conversation could even be located in Russia."

Programmers talked about the importance of good communication skills.

"The quality of my writing directly impacts the quality of the products we produce."

"Poor writing has led to many being confused on how to perform certain tasks and results in the users waiting to hear from the creators for clarification, which slows down the projects."

The programmers in our survey use a variety of technologies as well as emails and instant messaging to communicate with colleagues. Said one programmer,

"I [couldn't] think of the last time I received an important paper document."

Another programmer said,

"I made contact with so many employees online, yet I have only seen a fraction of them face to face."

Audiences
Other programmers
Managers
CEO
Marketing
Clients
Users

Documents
Agendas
Bug descriptions
Chat room messages
Code document
Contracts
Design documents
Design proposals
Emails
Grant proposals
IM
Installation instructions and other user documentation
Memos
PowerPoint
Presentations
Process documents
Product change requests and design change requests
Program specifications
Progress reports
Release notes
RFIs
RFPs
Solution summary document
Standard operating procedures
Statement of work
Status reports
Technical design
Test plans
Test plans and cases
Threat modeling documents
Wikis

Research

The research professionals in our sample work in private, public, and academic laboratories, where their primary responsibilities involve research. Researchers represent 7% of our database. They primarily work in large organizations with over 500 employees, and very few work in companies with less than 50 employees (5%).

Of all the groups, researchers spend the most time writing on the job (52%), which is different from six year ago where they indicated that they spent the least amount of time writing on the job (29%). Researchers spend the least amount of time writing emails (24%), and instant messaging (5%) compared to all of the other professionals. They spend 5% of their time using blogs, which is slightly above the mean average.

Not surprisingly, researchers spend the most of their time writing formal documents (42%). They spend 18% of their time writing memos, and 15% of their time writing letters.

Researchers indicated that they spend the least amount of time communicating orally than the other professionals one-on-one in person (26%), one-on-one on the phone (17%), and in group meetings (22%). They spend 12% of their time in group teleconferences, which is lower than the mean for all of the other professionals.

Researchers were very forthcoming about the importance of the need for good, writing skills on the job. As they pointed to the fact that effective writing builds credibility and results in the professionals being taken more seriously, one researcher commented,

"Poor writing leads to losing one's job and credibility."

Audience consideration was a primary theme in many of the researchers' comments as one researcher stated,

"The key here is to design the communication based on the audience's needs."

Another researcher stated,

"It is important to write each section of a laboratory report accurately, especially the methods sections, so that other researchers who are trying to repeat the experiment and are unfamiliar with the procedures can easily follow through."

Since funding and publishing research are such important aspects of these professionals' communication, one researcher illustrated how good communication skills are vital.

"People read what I write in order to understand my scientific research."

The following audiences and documents reflect the emphasis on communication with other researchers:

Audiences
Peers
Managers/Advisors
Funding Agencies
Regulatory Agencies
Clients
Media

Documents

Abstracts
Annual reports
Book and journal reviews
Book chapter
Clinical paperwork
Compliance contracts
Conference presentations
Email
Grant proposals
Grant proposals
IM
Journal articles
Journal papers
Lab operational reports and notebooks
Memos
Newsletter articles
Newspaper articles
Operating, quality, and safety procedures
PowerPoint
Quality manuals
Research articles
Press releases
SAP documents
Scientific articles and manuscripts
SOP
Spreadsheets
Technical bulletins and reports
Text
Web copy
White papers on internal research

What do professionals say about college instruction in writing and speaking?

The interviews with professionals produced many suggestions. Numerous professionals stated that college courses should prepare students for communication practices in the workplace. Notably, some respondents indicated that students should have an understanding of foundational communication; however, some also advocated integration of common and emerging communication technology.

"A lot more emphasis should be put on schools and colleges to teach students the qualities of an effective communicator."

Some of the competencies mentioned were: writing summaries; using proper spelling and grammar; adapting to different audiences; honing interpersonal skills; and creating formal document, emails, and letters.

In addition to the basics, respondents were often specific about the type of technology that they felt should be integrated in professional communication curriculum.

"Students should be taught to use current common programs like PPT and Excel to create dynamic and efficient presentations for executives."

Technology that was common in the last edition of the Communication in the Workplace report, including tools like email and programs like PowerPoint, were

again mentioned as important. Additionally, instruction about communication technologies such as IM, Facebook, Twitter, smartphones, and video was suggested. One student wrote,

"While learning how to draft long papers and memos should still be a component, some focus should be on how to draft short messages (such as emails) and how to professionally handle interpersonal communications such as Instant and Text Messages."

What did the student interviewers learn from the assignment?

In reading the student reports, we also gained some insight into how students reacted to the interview assignment. One called the interview results a "surprise" because they showed how much writing has to be done in the workplace. In this final set of quotations, we give the students the last words. We think these demonstrate the valuable lessons they learned:

"I also found it surprising as to how much time professionals spend writing. I expected that most engineering and pharmaceutical technicians would be working with the technicalities of their processes the entire time, but a high amount of time is dealt with in the documentation part."

"I learned from this interview that if you were not up to date with your communication skills, you might fall behind in your field."

"It was interesting to learn that he spends more time writing than doing hands-on research work, and the number of different types of writing that are used in this field surprised me."

"Writing is going to be much more important in my future career than I had thought."

What are the more important things we learn from this study?

Like the studies we have done since 1996, the data we report here from 2012 overwhelmingly affirm the central importance of communication in the workplace. Both the quantitative results of the questionnaire and the qualitative information from the student reports show that communication, both written and oral, is an integral part of the work of technical, business, and scientific professionals in fields that NC State students represent.

The importance of communication, both written and oral, is shown both in the amount of time it consumes on the job and in the central role it plays in getting work done. Its importance is also demonstrated by the fact that 89% of our respondents indicated that communication is part of their job performance appraisals.

Our study also provides us with a snapshot of the great diversity of communication tasks and patterns that are required in the workplace. The documents mentioned in the 2012 survey results include

- Abstracts
- Action plans
- Adverse conditions investigations
- Advertisements
- Advertisements
- Agendas
- Analysis
- Annual budgets
- Annual reports
- Articles
- Asset acquisition reports
- Audit finding reports
- Audit memos and opinions
- Audit proposals
- Benefit plan descriptions
- Bi-annual progress reports
- Bid packages
- Blogs
- Book and journal reviews
- Brochures
- Budget projections
- Bug descriptions
- Business letters
- Business plans
- Business reviews
- Capital funding requests
- Case briefs
- Chat
- Clinical paperwork
- Code document
- Compliance contracts
- Conference papers
- Conference presentations
- Contracts
- Creative briefs
- Departmental policies
- Design documents
- Design proposals
- Directions
- Education and grant proposals
- Email blasts
- Emails
- Employee evaluations
- Employee reviews
- Evaluations
- Executive Summary
- Expense reports and forecasts
- Explanation of purchase orders
- Exposure assessment reports
- Financial analysis reports
- Financial requests to county government
- Financial statements
- Flyers
- Formal letters
- Functional specifications
- Gantt charts
- Grant proposals
- Grant reports
- Help documentation
- IM
- Incident reports
- Install instructions
- Instructions
- Interview and case reports
- Investment recommendations
- Invoices
- Job descriptions
- Job schedules

- Journal articles
- Journal papers
- Justifications of promotion
- KPI
- Lab notebooks
- Lab operational reports
- Letter of intent
- Letters
- Letters of interest
- Letters of recommendation
- Licensing Proposals
- Loan comments and commitment letters
- Manuals
- Manuscripts
- Market analyses
- Marketing plans
- Meeting minutes
- Memos
- Monthly reports
- Newsletter articles
- Newsletters
- Newspaper articles
- Notes in CAD
- Operating, quality, and safety procedures
- Pamphlets
- Performance appraisals
- Personnel reports
- Policies
- Portfolio reviews
- Post mortem reports
- PowerPoint
- Presentations
- Press releases
- Procedural notes
- Procedures
- Process documents
- Product assessments
- Product change requests and design change requests
- Product comparisons
- Product features
- Product requirement specifications
- Profit and loss reports
- Program specifications
- Programming code documentation
- Progress reports
- Progress updates
- Project plan
- Proposals (internal and external)
- Prospecting letter
- Purchase order
- Qualifications packages
- Quality manuals
- Quality procedures
- Quarterly analysis reports
- Quick-step guides
- Recommendation letters
- Release notes
- Reports
- Research articles
- Research papers
- Research reports
- Reviews
- RFIs
- RFP
- RFQs
- Risk management reports
- Safety manuals
- Safety procedures
- Sales forecasts
- SAP documents
- Scheduling
- Schematics

- Scientific articles and manuscripts
- Scope of work
- Software requirements
- Solution summary document
- SOP
- Speeches
- Spreadsheets
- Statement of confidentiality
- Statement of work
- Status reports
- Status reports
- Status updates
- Study protocols
- Summaries
- Teaching materials
- Technical bulletins and reports
- Technical design
- Technical drawings
- Technical manual
- Technical papers for publication
- Technical reports
- Technical specifications
- Teleconference
- Termination paperwork
- Test cases
- Test documentation
- Test plans
- Test cases
- Test reports
- Text messages
- Textbooks
- Threat modeling documents
- Timelines
- Training documents
- Tweets
- User manual
- User specifications
- Valuation reports
- Verification specifications
- Web copy
- Weekly/Monthly sales forecast
- White papers
- Wikis
- Work orders
- Work plans
- Workarounds
- Year end performance reviews

These tasks and patterns constantly evolve, adapting to innovations in technology and changes in socio-economic conditions. Professionals in each major area of our survey can expect somewhat different challenges, but all of them must be prepared to be flexible and to continue learning.

Communication is not a separate task, tacked on to professional work; rather, it is part and parcel of that work. Collaborating, problem solving, evaluating, and managing change—all take place in and through communication.

Appendices

Appendix A Survey questionnaire

Professional Data

1. What is your job title?

2. What is your field?

- Education
- Engineering
- Finance, Accounting, Banking
- Management
- Marketing/Sales
- Programming
- Research
- Other

3. What is your company name?

4. How large is your company?

50 or fewer 50-100 100-500 Over 500

5. What degrees do you have?

B.A. B.S. M.A. M.S. M.B.A. J.D.

Ph.D/Ed.D/M.D.

6. List the degree(s), institution(s), and Year(s) of Graduation. For example: B.S. in Electrical Engineering, North Carolina State University, 1998 M.B.A, Duke University, 2005

7. 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

8. If yes, was the course required?

Yes No

Writing and Speaking on the Job

9. Are oral and written communication a part of your performance appraisal?

Yes No

10. How important is the quality of your writing for the performance of your job?

Essential Very Important Not Very important Unimportant Irrelevant

11. How important is your writing to your career advancement?

Essential Very Important Not Very important Unimportant Irrelevant

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

13. What percentage of your time is spent working with others to plan and write documents?

What percent of your **writing** time is spent **composing** the following (this does NOT have to add up to 100%):

14. Email

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

15. Chat/IM/Text messages

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

16. Blogs
    - 0-5%
    - 6-10%
    - 11-20%
    - 21-30%
    - 31-40%
    - 41-50%
    - 51-60%
    - 61-70%
    - 71-80%
    - 81-90%
    - 91-100%

17. Short, internal word-processed documents (e.g., memos)
    - 0-5%
    - 6-10%
    - 11-20%
    - 21-30%
    - 31-40%
    - 41-50%
    - 51-60%
    - 61-70%
    - 71-80%
    - 81-90%
    - 91-100%

18. Short, external word-processed documents (e.g., letters)
    - 0-5%
    - 6-10%
    - 11-20%
    - 21-30%
    - 31-40%
    - 41-50%
    - 51-60%
    - 61-70%
    - 71-80%
    - 81-90%
    - 91-100%

19. Long word-processed documents
    (e.g., reports and proposals)
    - 0-5%
    - 6-10%
    - 11-20%
    - 21-30%
    - 31-40%
    - 41-50%
    - 51-60%
    - 61-70%
    - 71-80%
    - 81-90%
    - 91-100%

What percentage of your time is spent orally communicating one-on-one?

20. In person

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

21. Phone

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

What percentage of your time is spent orally communicating in group meetings?

22. In person

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

23. Teleconference

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

When you communicate at work, what percentage of the time do you use the following devices? (this does NOT have to add up to 100%)?

24. Desktop

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

25. Laptop

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

26. Tablet

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

27. Phone

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

28. Other hand-held device

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

Global Communication

29. What percentage of your time communicating on the job is with people from other countries?

Interview questions

1. What types of documents do you write?
   Please use the names you usually call them and describe their contents, length, format, how often you produce them, for whom, and their importance.
2. Why do people read what you write? What decisions or actions does your writing affect?
3. How did you learn to do the writing you have to do in your work - on the job, workplace training, college course, etc.? Of these, what were the most useful aspects of the training you have received in writing?
4. In what ways has technology changed the way you communicate at work, especially over the past five years?
5. Please describe any examples of the consequences of effective or ineffective writing within your organization.

*Collect direct quotes that can be used in your report.

Appendix B Qualitative analysis

Each of the student reports was read and coded for issues that had been identified in our 2007 research. As we read for this additional information, we also extracted and cross-referenced quotations from both the respondents and the students.

Socialization
- on-the-job training and mentoring
- sources of information for writing
- expectations versus reality
- consequences of effective and ineffective writing

Rhetorical situation
- audiences, internal and external
- purposes of writing
- types of documents

Pedagogy
- recommendations for instruction

Process
- drafts, number generated
- collaboration practices
- review and editing practices

Technology
- impact of word processing software
- impact of advances in hardware, including use of email
- impact of internet

International
- impacts of international audiences, internal and external
- issues that surface in companies with international audiences

Oral communication
- impacts and issues of oral communication on the job

Appendix C Descriptive statistics

Below are the mean responses to all questions for the whole group and for the major subgroups. Responses to questions 1, 2 and 3 on the survey form in Appendix A were used to create the subgroups (field) and the list of organizations in Appendix E (company name).

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	541	51	159	93	86	65	47	40

Question 4: Size of Organization

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
<50 employees	24%	18%	16%	30%	29%	38%	30%	5%
51-500	19%	10%	7%	4%	12%	8%	2%	18%
>500	57%	72%	77%	66%	59%	54%	68%	77%

Question 7: Technical writing course taken in college (Yes)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	60%	7%	36%	16%	15%	13%	8%	5%

Question 8: Technical writing course required

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	51%	6%	38%	16%	14%	12%	9%	5%

Question 9: Written and oral communication part of the performance appraisal

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	89%	10%	28%	17%	16%	13%	8%	8%

Question 10: Importance of writing quality to job performance

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
Essential	274	37	64	46	47	36	14	30
Very Important	221	9	80	40	35	24	23	10
Not Very Important	43	5	15	7	4	3	9	0
Unimportant	3	0	0	0	0	2	1	0
Irrelevant	0	0	0	0	0	0	0	0

Question 11: Importance of writing quality to career advancement

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
Essential	238	35	54	36	41	27	16	29
Very Important	230	12	84	45	32	25	23	9
Not Very Important	62	4	20	11	11	7	8	1
Unimportant	6	0	1	0	0	4	0	1
Irrelevant	5	0	0	1	2	2	0	0

Question 12: Percentage of time spent writing (planning, drafting, revising) (WRREQ)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	39%	46%	37%	36%	39%	41%	26%	52%

Question 13: Percentage of time spent planning and writing collaboratively (WRCOL)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	20%	20%	20%	20%	25%	24%	13%	21%

Question 14: Percentage of time spent writing emails (EMAIL)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	39%	35%	36%	41%	46%	52%	37%	24%

Question 15: Percentage of time spent writing Chat/IM/Text messages (CHAT)
NOTE: The following means are reported with their corresponding standard deviations because this data was skewed. This data will not be included in the statistical analysis in Appendix D, which contains the factor analysis and analysis of variance.

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	11%	7%	9%	12%	13%	16%	14%	5%
STANDARD DEVIATION		9.94	14.11	16.13	18.50	19.76	13.99	7.73

Question 16: Percentage of time spent writing blogs (BLOG)
NOTE: The following means are reported with their corresponding standard deviations because this data was skewed. This data will not be included in the statistical analysis in Appendix D, which contains the factor analysis and analysis of variance.

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	4%	4%	3%	4%	4%	9%	4%	5%
STANDARD DEVIATION		4.88	3.19	7.91	5.25	14.01	3.12	13.03

Question 17: Percentage of time spent writing internal company documents (MEMOS)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	16%	13%	15%	18%	21%	20%	10%	18%

Question 18: Percentage of time spent writing external company documents (LETTER)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	14%	13%	12%	14%	18%	18%	7%	15%

Question 19: Percentage of time spent writing formal documents (FORMAL)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	24%	29%	23%	21%	21%	20%	15%	42%

Question 20: Percentage of time spent orally communicating one-on-one in person (OPER)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	36%	39%	36%	37%	46%	39%	27%	26%

Question 21: Percentage of time spent orally communicating one-on-one on the phone (OPHO)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	25%	16%	23%	28%	38%	33%	19%	17%

Question 22: Percentage of time spent orally communicating in group meetings in person (GPER)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	30%	28%	29%	31%	35%	38%	25%	22%

Question 23: Percentage of time spent orally communicating in group teleconferences (GTELE)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	14%	8%	16%	19%	18%	16%	11%	12%

Question 24: Percentage of time spent using a desktop computer (DESKTOP)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	39%	30%	39%	43%	32%	48%	42%	39%

Question 25: Percentage of time spent using a laptop computer (LAPTOP)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	36%	45%	33%	32%	39%	32%	40%	37%

Question 26: Percentage of time spent using a tablet (TABLET)
NOTE: The following means are reported with their corresponding standard deviations because this data was skewed. This data will not be included in the statistical analysis in Appendix D, which contains the factor analysis and analysis of variance.

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	6%	6%	5%	7%	5%	7%	4%	7%
STANDARD DEVIATION		12.48	8.18	15.67	10.18	12.65	2.93	12.43

Question 27: Percentage of time using a phone (PHONE)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	29%	19%	27%	30%	42%	40%	20%	22%

Question 28: Percentage of time using other hand-held devices (OTHER)
NOTE: The following means are reported with their corresponding standard deviations because this data was skewed. This data will not be included in the statistical analysis in Appendix D, which contains the factor analysis and analysis of variance.

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	7%	7%	5%	8%	11%	8%	4%	10%
STANDARD DEVIATION		11.93	6.10	14.92	19.15	13.34	3.35	19.66

Question 29: Percentage of time spent communicating with people from other countries (INT)

	ALL	EDU	ENG	FIN	MGR	MKT	PGM	RES
TOTALS	10%	10%	10%	11%	10%	7%	8%	14%

Ranks by Variable and Title

The following table shows the rankings of the variables from highest (1) to lowest (18) based on the percentages of time spent writing, collaborating, and communicating for each title.

VARIABLE	EDU	ENG	FIN	MGR	MKT	PGM	RES
WRREQ	1	2	4	4	3	5	1
WRCOL	8	10	10	9	9	11	9
EMAIL	4	4	2	1	1	3	6
CHAT	15	15	14	14	14	10	17
BLOG	18	18	18	18	15	16	18
MEMOS	11	12	12	11	11	13	10
LETTER	12	13	13	12	12	15	12
FORMAL	6	8	9	10	10	9	2
OPER	3	3	3	2	5	4	5
OPHO	10	9	8	6	7	8	11
GPER	3	6	6	7	6	6	8
GTELE	14	11	11	13	13	12	14
DESKTOP	5	1	1	8	2	1	3
LAPTOP	2	5	5	5	8	2	4
TABLET	17	16	17	17	18	18	16
PHONE	9	7	7	3	4	7	7
OTHER	16	17	16	15	16	17	15
INT	13	14	15	16	17	14	13

The rankings are interesting since they show that time spent writing on the job is ranked from 1-5 across the professions. Email is also of high importance across professions with rankings from 1 to 6.

Time spent using BLOGS ranked last (18) for EDU, ENG, FIN, MGR and RES. Oral communication in person (OPER) also ranked profession with a range from 2 to 5.

Appendix D Statistical analysis

Fourteen survey questions involve similar variables related to professional's communication behavior (see Appendix A, questions 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 25, 27, and 29). These performance-based questions lend themselves to a factor analysis to construct summary scores for correlated activities. The rotated factor pattern revealed the following five factors with high loadings:

Factor 1:	Time spent writing on the job	.80
	Writing in collaboration with others	.75
	Writing long formal documents (e.g., reports, proposals)	.66
	Writing short external documents (e.g., letters)	.55
Factor 2:	Oral communication one-on-one on the phone	.81
	Time using a phone	.76
	Oral communication in group teleconferences	.67
Factor 3:	Oral communication in group meetings in person	.80
	Oral communication one-on-one in person	.78
	Email	.54
Factor 4:	International Communication	.47
	Chat	.45
Factor 5:	Laptop	.88
	Desktop	-.88

Factor 1 is consistent with prior data in that it shows that long, formal documents are created on the job in collaboration with others. An interesting new finding is that external, short documents are also related to required, collaborative writing on the job.

Factor 2 relates oral communication on the phone with group communication via teleconferences.

Factor 3 is consistent with prior data in that it relates oral communication with email.

Factor 4 shows that international communication and chat are related, but they are not strong enough to form a factor from which to draw conclusions. It is interesting to note that these two variables were a factor in the 2007 study.

Factor 5 is not surprising in that it links laptop and desktop usage. These questions (24 and 25) were not included in prior surveys.

What is interesting is that in the study that was conducted in 2007, chat and international communication were related. In this study, they are not.

Analysis of Variance

The table below shows the P-values for variables showing significant differences between professionals based on job title, size of organization, or both (bold p-values are significant at <0.05). No correlation was found between chat, tablet, blog, or other hand-held device usage. This data was skewed so in the following analysis of variance, these variables are excluded.

Dependent Variable	Job Title	Size of Organization	Size and Title
WRREQ	0.1061	0.1067	0.3556
WRCOL	**0.0441**	**0.0269**	0.5523
EMAIL	**<.0001**	0.4068	0.7664
MEMOS	**0.0465**	0.2178	0.9499
LETTER	**0.0051**	0.1242	0.1974
FORMAL	0.1662	0.2192	0.4858
OPER	**<.0001**	0.2609	**0.0095**
OPHO	**<.0001**	0.2456	0.7513
GPER	**0.0398**	0.5457	0.9508
GTELE	**0.0442**	0.0697	0.2454
DESKTOP	0.1459	0.1520	0.2556
LAPTOP	0.1669	0.4143	0.1657
PHONE	**<.0001**	0.1269	0.4557
INT	0.3712	**0.0473**	0.3808

The analysis of variance (ANOVA) shows significant differences between variables that had no interaction with job title or size of organization. Only OPER (oral communication one-on-one in person) had an interaction so that variable is analyzed separately.

ANOVA by Size of Organization

For this study, an additional data analysis was run using the Arc Sine Transformation. The arc sine transformed LSMEANS are listed in parentheses. The CODES are listed to show significant differences, and in most cases those items with the same letter are not significantly different. However, because of the variable number of responses for each title and size of organization the standard errors are different and not all differences are shown with the letters. In the conclusions for each variable, the additional pairs that are significantly different will be noted.

Time Spent Planning and Writing Collaboratively (WRCOL)

Size of Organization	LSMEAN (Arc Sine)	CODE
51-500	22.92 (0.49)	A
Less than 50	17.50 (0.43)	AB
More than 500	16.04 (0.41)	B

Conclusion: Employees in organizations with more than 500 employees do less collaboration with other employees in writing and planning documents than employees in mid-sized companies (51-500).

Time spent communicating with people from other countries (INT)

Size of Organization	LSMEAN (Arc Sine)	CODE
51-500	7.12 (0.27)	A
More than 500	6.94 (0.27)	A
Less than 50	3.08 (0.18)	A

Conclusion: The CODE column does not reflect all significant comparisons because of the unbalanced nature of this data. Based on the Tukey Multiple Comparisons Tests, employees in companies with over 500 employees engage in significantly more international communication than employees in companies with less than 50 employees.

ANOVA by Title

Title LSMEANS are listed in order from highest and lowest for each variable. The arc sine LSMEANS are shown in parentheses. The CODES are listed, and in most cases those items with the same letter are not significantly different. However, because of the unequal sample sizes, the CODES display might not display all significant comparisons. In the conclusions for each variable, the additional pairs that are significantly different will be noted.

Time spent planning and writing collaboratively (WRCOL)

Title	LSMEAN (Arc Sine)	CODE
Managers (MGR)	22.55 (0.49)	A
Researchers (RES)	22.13 (0.49)	AB
Marketing (MKT)	21.96 (0.49)	AB
Finance (FIN)	19.49 (0.46)	AB
Educators (EDU)	18.81 (0.45)	AB
Engineers (ENG)	17.44 (0.43)	AB
Programmers (PGM)	10.15 (0.32)	B

Conclusion: Programmers spend less time communicating collaboratively than do Managers.

Time spent writing email (EMAIL)

Title	LSMEAN (Arc Sine)	CODE
Marketing (MKT)	52.77 (0.81)	A
Managers (MGR)	46.99 (0.76)	AB
Finance (FIN)	39.42 (0.68)	ABC
Engineers (ENG)	34.20 (0.62)	BC
Educators (EDU)	32.48 (0.61)	BC
Programmers (PGM)	30.91 (0.59)	BC
Researchers (RES)	19.35 (0.46)	C

Conclusion: Marketing professionals communicate more using email than Engineers, Educators, Programmers, and Researchers. Managers communicate more using email than Researchers. In addition to the difference shown above, the Tukey Multiple Comparison Tests indicated that Managers communicate using email more than Engineers.

Time spent writing internal company documents (MEMOS)

Title	LSMEAN (Arc Sine)	CODE
Managers (MGR)	18.76 (0.45)	A
Finance (FIN)	16.67 (0.42)	A
Marketing (MKT)	16.66 (0.42)	A
Educators (EDU)	13.31 (0.37)	A
Engineers (ENG)	12.57 (0.36)	A
Researchers (RES)	12.23 (0.36)	A
Programmers (PGM)	9.04 (0.31)	A

Conclusion: Even though the p-value=(.0465) for MEMOS, the Tukey Multiple Comparison Tests indicated no statistically significant differences in the amount of time professionals spend communicating using memos.

Time spent writing external company documents (LETTER)

Title	LSMEAN (Arc Sine)	CODE
Managers (MGR)	16.58 (0.42)	A
Marketing (MKT)	14.41 (0.39)	AB
Finance (FIN)	14.10 (0.38)	AB
Researchers (RES)	10.32 (0.33)	AB
Engineers (ENG)	9.90 (0.32)	AB
Educators (EDU)	9.80 (0.32)	AB
Programmers (PGM)	7.63 (0.28)	B

Conclusion: Programmers spend less time writing external company documents than do Managers. In addition to the differences shown above, the Tukey Multiple Comparison Tests indicate that there is a significant difference between Managers and Engineers, with Managers communicating more using LETTERS than do Engineers.

Time spent orally communicating one-on-one on the phone (OPHO)

Title	LSMEAN (Arc Sine)	CODE
Managers (MGR)	37.58 (0.66)	A
Marketing (MKT)	31.09 (0.59)	AB
Finance (FIN)	25.82 (0.53)	ABC
Engineers (ENG)	21.23 (0.48)	BC
Programmers (PGM)	18.55 (0.45)	BC
Educators (EDU)	14.70 (0.39)	C
Researchers (RES)	11.29 (0.34)	C

Conclusion: Managers communicate more orally using the phone than do Engineers, Programmers, Educators, and Researchers. Marketing professionals communicate more orally using the phone than do Educators and Researchers.

Time spent orally communicating in group meetings in person (GPER)

Title	LSMEAN (Arc Sine)	CODE
Marketing (MKT)	36.67 (0.65)	A
Managers (MGR)	33.70 (0.62)	A
Finance (FIN)	28.14 (0.56)	A
Educators (EDU)	26.72 (0.54)	A
Engineers (ENG)	26.17 (0.54)	A
Programmers (PGM)	22.49 (0.49)	A
Researchers (RES)	15.03 (0.40)	A

Conclusion: Even though the p-value for this variable is .0398, which indicates significant differences, the Tukey Multiple Comparison Tests do not show any differences in order to draw conclusions.

Time spent orally communicating in group teleconferences (GTELE)

Title	LSMEAN (Arc Sine)	CODE
Managers (MGR)	14.78 (0.39)	A
Marketing (MKT)	13.05 (0.37)	AB
Finance (FIN)	12.86 (0.37)	AB
Engineers (ENG)	11.75 (0.35)	AB
Researchers (RES)	8.36 (0.29)	AB
Programmers (PGM)	8.14 (0.29)	AB
Educators (EDU)	5.76 (0.24)	B

Conclusion: Managers spend more time communicating in group teleconferences than do Educators.

Time spent using a phone (PHONE)

Title	LSMEAN (Arc Sine)	CODE
Managers (MGR)	42.98 (0.72)	A
Marketing (MKT)	38.14 (0.67)	AB
Finance (FIN)	27.19 (0.55)	B
Engineers (ENG)	25.88 (0.53)	B
Educators (EDU)	22.30 (0.49)	B
Programmers (PGM)	18.11 (0.44)	B
Researchers (RES)	15.37 (0.40)	B

Conclusion: Managers communicate more using the phone than all other professionals except for Marketing professionals.

Analysis of Variable with Interaction

Time spent orally communicating one-on-one in person (OPER)

Oral communication one-on-one person (OPER) was the only variable to have a significant interaction between size of organization and title, so the interaction LSMEANS are shown for each combination of size and title.

	<less than 50	51-500	More than 500
Managers (MGR)	51.30 (0.80)	59.32 (0.88)	37.88 (0.66)
Finance (FIN)	31.67 (0.60)	33.32 (0.62)	38.10 (0.67)
Marketing (MKT)	32.10 (0.60)	34.57 (0.63)	48.60 (0.77)
Educators (EDU)	54.74 (0.83)	63.52 (0.92)	27.75 (0.55)
Engineers (ENG)	31.79 (0.60)	39.00 (0.67)	33.86 (0.62)
Researchers (RES)	15.00 (0.40)	25.09 (0.52)	23.76 (0.51)
Programmers (PGM)	16.22 (0.41)	23.67 (0.51)	28.20 (0.56)

Conclusion: Based on the Tukey Multiple Comparison Tests, the only significant result is that in companies with less than 50 employees, Managers communicate one-on-one in person more than Programmers.

Appendix E Employers of survey respondents

3-C Institute for Social Development
5AM Solutions
A Medical Product Company
AAR Cargo Systems
ABB Automation and Power (2)
Academic Support Program for Student-Athletes - NC State
Accurate Electronics, Inc.
ACS Benefit Services Inc. (2)
Advanced Energy (2)
Adzerk
Ajinomoto North America, INC.
Alamance Regional Medical Center
Alcatel-Lucent
Alesco Advisors LLC
Altec Industries
Amazon
American Kennel Club
Analog Devices (2)
Anchor Auto Sales
Ann Inc.
Applied Automation
Arkansas State Highway & Transportation Department
Art By Me
Arvest Bank Operations
ASPE, Inc. (2)
AT&T (3)
Athen Drive High School
ATI Industrial Automation (2)
AudioCodes, Inc.
Aveda Institute Chapel Hill
B/E Aerospace
Baldor Electric Company
Balfour Beatty Construction
Bandwidth.com
Bank of America (6)
Barnes Paving Co.

Barnhill Contracting Company
BASF Corporation (2)
BB&T (3)
BBL Transport
BCBGMax Azria
BDO
Becton, Dickinson and Company (BD)
Belk
Benda-Lutz Corporation
Bernhardt Design
Best Import Motors Inc.
Biogen Idec
Black & Veatch
Blue Cross Blue Shield of NC
Bluetech Computing
BMW manufacturing
Boggs Paving, Inc.
Booz Allen Hamilton
Brasfield & Gorrie
Breathing Space Institute
Bronto Software
BSH Home Appliances
BSL Telephony Services
BTU-Consultants
Burlington Royals
Burr Pilger Mayer
Campus Crossings
Campus Edge- Tribridge Residential
Capital Investment Brokerage
Carolina Graphic Press, Inc.
Carter, P.C.
Cary Foot and Ankle Specialists
Casa Esperanza Montessori Charter School
Caterpillar (4)
CENREP
Center for Environmental Farming Systems
Charlotte Russe
Circle B Ranch

Cisco Systems (3)
Citrix Systems, Inc.
City of Greensboro Parks & Recreation
City of High Point
Clark Nexsen
Clarkston Consulting
Clio Funds Management, LLC
Cognizant
Compass Group
Connexion Technologies
Converse College
Cook Medical (Endoscopy Division)
Core Sound Imaging
Council on Education in Management
Covidien
Credit Suisse (4)
Cree, Inc. (3)
CRENSHAW CONSULTING ENGINEERS, INC.
Cummins
D. S. Simmons Inc. (2)
D.P. Dough
Danaher Controls
Defense Contract Audit Agency
Deloitte
Department of Anesthesiology
Deutsche Bank Global Technology (2)
Diosynth
Dixon-Hughes Goodman
Dockery Design
Domtar
Doosan Infracore
Draft FCB- Healthcare
Du Pont
Duke Energy (3)
Duke University Medical Center (2)
E+ technology
East Carolina University
Eaton Corporation (5)

ECLS
Electro-Motive Diesel
Elster Solutions
EMC Corporation (2)
Engine Systems Inc.
Engineered Sintered Components
English Sow Farm
Enhanced Equity Funds
Envry Corporation
ERM, Inc.
Ernst & Young (2)
ESCC
Eva Perry Regional Library
FDH Engineering
Financial management of Park (2)
Flaunt
Flexcell International Corporation
Flextronics
Frank A. Elmore, CPA, P.A.
Franklin City Public Schools
G.R Little Agency
GE Hitachi Nuclear Energy
Genealogy Boutique & Formals
General Electric (3)
General Motors Co
Genworth Financial (3)
Geographic Technologies Group
Gilero Biomedical
GlaxoSmithKline
Glenn Lumber Co. Inc.
Global Knowledge
Glover Construction
Grant Thornton, LLP
Greenhorne & O'Mara, Inc.
GSK (GlaxoSmithKline)
Hafele America Co.
Hanesbrands, Inc
Hardy Farm's, Inc.

Harris
Harrispark Properties
Hazen and Sawyer
HD Supply
Hibernian Company, Inc
Hollister Co
HomeTowne Realty
Honda of Concord
Honeywell International, Inc.
Huesker inc.
Hull Capital Management
Hyman and Robey, PC
IBM (6)
INDUSTRIAL ACOUSTICS
Innosoul
Intellimedia Group, Department of Computer Science, North Carolina State University
International Paper (2)
International Textile Group, Inc.
Islanders Surf and Sport
IT Broadcasting
ITT Exelis
J.B. Watson & Co., PLLC
JFK Consulting and Marketing
John Deere
Johns Hopkins Applied Physics Lab
Johnson Lambert and Co
Johnston County Government
Juki Automation Systems
Kadro Solutions
Kayser-Roth Corporation (3)
Kelly MarCom (2)
Kilian Engineering, Inc
KMI
Kuwana North Senior High School
L3 Communications Crestview Aerospace
Landmark Properties
Lend Lease Americas

Lewis Financial Management LLC. (2)
Lizzie Lu's
LKQ
Lockheed Martin (2)
Lonesource
Lonnie Poole Golf Course at NC State University
Lord corporation
Lorillard Tobacco Company
M/I Homes
Maddison & Caison
Make-A-Wish Foundation of Eastern NC (2)
Marine Corps
Marquee Cinemas
McKay Consulting - Consult for Progress Energy
McMillan Pate
Medicago USA, Inc
Medimmune, LLC
Merrill Lynch (2)
Michael Baker Engineering
Mighty Rabbit Studios
Moog Components Group
More Space Place
MSwaniger Business Services
Myriad Supply
Navy Federal Credit Union
NC Cooperative Extension
NC Farm Bureau
NC State University (73)
NCDOT
nContact Surgical
NCSSM
Net32
NetApp
NICCA USA
Norhtrop Grumman
North Carolina Department of Commerce
North Carolina Department of Transportation (2)
North Carolina Division of Air Qulity

North Carolina Housing Finance Agency
North Carolina State Bureau of Investgation
Northrop Grumman
Northwestern Mutual Financial Network (3)
Nova Energy Consultants, Inc.
Nowlen, Holt & Miner, P.A.
Ockham Development Group
OnWire Consulting Group
Open Silicon
PC knowledge llc
PDA, Inc.
Pegasystems Inc.
Perdue Farms, Mizelle Farms
Perfect FIt Industries
Personify
Pfizer
Pharr Technologies (2)
Pitt County Memorial Hospital
Pittard, Perry, & Crone Inc.
Planet Fitness
Plexus
Poole College of Management, N.C. State University
Premier Athletics
Premier Magazine
Premiere Global Sports
Press Pass, Inc.
PricewaterhouseCoopers LLP (2)
Professional Mail Services, Inc.
Professional Project Services
Progress Energy (9)
Pwc (2)
RAD Trust-trust within the NC Department of Insurance
Ralph Lauren
Ramey Kemp & Associates
Randall Miller & Associates
Red Hat Inc.
Red House Group, Inc
Red Storm Entertainment

RedPrairie
Redwood Software
Regatta, Inc.
Research In Motion
Ricoh
River Enterprises
Rivers and Associates
RKK
Robert Bosch, LLC
Roll X Pro Shop
Royal Bank of Canada
Royal Parking
RTI International (2)
Sageworks Inc.
Samet Corporation
SAS Institute, Inc. (13)
Schneider Electric (2)
SchoolDude.com
Sears Holdings Co.
Sedation Dental Care
Shaw Group
Shawlsmith London
Shepherd's Way Day School
Sheraton Raleigh Hotel
Shodor
Siemens Energy, Inc. (2)
Siemens Healthcare Diagnostics (2)
Sign Worx
Simon Property Group/Concord Mills
Small Business Development Center
Smith & Nephew
Sorin Group USA
Sound Financial Management Inc.
Sparqware
Special Service Plastic
St. Michael's Episcopal Church
Stage Stores/Peebles (2)
State Employees' Credit Union

SteelFab
Sterling Events Group
Stop Hunger Now
SunTrust
Swaim, Inc. (3)
SWEPCO
T A Loving Company
TAE, Inc
Targacept, Inc.
TD Bank N.A.
Tech Systems (2)
Tekelec (4)
Tencarva Machinery Company
The Cato Corporation
The Charlotte Checkers
The East Carolina Bank
The Education Center
the former US West or Qwest (originally part of AT&T)
The Fred Smith Company
The LPA Group Inc. (A Unit of Michael Baker Corporation)
The Pantry, Inc
The Sherwin-Williams Company
Thomas Built Buses
TimBar
Timco Aerosystems
Timken Company
Tonestar ProduCKtionz
Tower Engineering Professionals
Town Of Cary
Town of Clayton, N.C.
Tracy Locke
Tree Improvement Program, Dept. of Forestry, NCSU
TriTek Fire & Security, LLC
Tuckers Air Conditioning & Heating
Two Toasters
UNC School of Dentistry
Union Square Computers
Uni-Select USA

United Rentals
United States Air Force (2)
United States Air Force
University of North Carolina at Greensboro
University of North Carolina School of Medicine
UPS
US Army Corps of Engineers
US Army Research Laboratory - Human Research and Engineering Directorate
US Patent Office
USDA Forest Service (Southern Research Station - RTP)
USGS
Uvo Luxury (2)
Vector Marketing
Verizon Wireless (2)
Versiant
Vertical Solutions, Inc.
Veterinary Specialty Hospital of the Carolinas
Virginia Capitol Police
Virginia Tech-Wake Forest University Center for Injury Biomechanics
Volt Workforce Solutions
Volvo Trucks North America
Wagoner Consulting Engineers
Wake County Public Schools
Wake Forest Health Sciences
Wake Technical Community College
WakeMed Health and Hospitals
Walmart
Waterborne Environmental inc.
Wells Fargo (3)
West Consultants, PLLC
Whitney Wealth Management Group
Williams Sonoma/Sutter Street
Wise Recycling LLC
Withers & Ravenel
Yolo Solutions
Yukon Medical

Acknowledgements

The following teachers supervised and coordinated the work of students enrolled in 27 sections of ENG 331, 332, and 333 classes during the spring 2012 semester:
Etta Barksdale
Christine Cranford
Daun Daemon
Sarah Egan Warren
Sarah Glova
Julia Helo
Ashley Kelly
Jamie Larsen
Nancy Penrose
Beryl Pittman
Jamie Sue Reed
Stephanie Trunzo

The questionnaire, revised and updated from the one used in 2006, was prepared by David Covington, Sarah Egan Warren, and Jamie Larsen.

Once again, the data analysis could not have been completed without the help and advice from Joy Smith, Business and Technology Application Specialist in the NC State Statistics Department. Joy conducted the factor analysis and analysis of variance, and provided invaluable advice about interpreting the survey data. Etta Barksdale, Christine Cranford, Sarah Egan-Warren, Sarah Glova, Julia Helo, and Jamie Larsen coded the qualitative data, which provides some of the most interesting information in the report. Thanks to Hayden Russell who also assisted in the preparation of the report.

Special thanks is also given to Dr. Carolyn Miller for her guidance in conducting prior research in 1997 and in 2001, which provides a solid foundation for analyzing this current set of data. Dr. David Covington, Director of the Professional Writing Program, provided insight and encouragement from the initial idea of conducting this research to the publication of the final results.