

Entry-Level Technical Writing Skills: Managers' Expectations and Experiences

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Final Applied Research Project for Completion of the Master of Science in Scientific and
Technical Communication Program

IRB Exempt

University of Minnesota

May 5, 2017

Abstract

In response to calls for more collaboration between the industry and academic programs, this study looks at technical writing managers' experiences with new writers in order to help managers of new writers anticipate and address potential areas of weakness and to help academic programs better prepare students for the field. In this paper, the author discusses the findings of a course analysis of six U.S. undergraduate technical writing programs to determine the common required core competencies in current technical writing programs. The author also reports on the findings of a survey of technical writing managers to determine managerial expectations of entry-level technical writers' proficiency in technical writing core competencies and those managers' actual experiences with new technical writers' skills after they started working. The key findings of the study indicated that managers had the highest expectations for skills in editing and style and visual and information design and the lowest expectations for new writers' audience analysis skills. Managers also indicated that they wanted new employees to have soft skills including skills in collaboration, teamwork, problem solving, and critical thinking. Finally, the author discusses the implications of the findings, possible next steps for technical writing managers, and possible avenues for future research.

Introduction

Whether a new technical writer is breaking into the workforce for the first time after graduation or transitioning into technical communication from a different career, a technical writing manager can expect that the new hire will need to gain knowledge and experience before he or she is a fully functioning member of the team. As hiring managers write job descriptions for entry-level writers, interview their candidates, and ultimately onboard and train the successful candidate, these managers envision an ideal state for what they want this employee to know and do in the scope of the position after training and experience. Managers also have expectations for what entry-level writers should already be able to accomplish at the time they are hired and what skills and knowledge they should have already built from education or previous experience. In a recent issue of *Technical Communication*, Albers (2016) notes the inability of many academic programs to prepare technical communication students adequately for practice in the field, and he calls for better communication between practitioners and academics to move beyond this long-standing issue.

Each workplace is different, and each technical writing job requires slightly different knowledge, so there is not a one-size-fits-all set of skills that equips entry-level writers with the competencies they need to complete their work in any technical writing position. Based on university programs and industry standards, however, there are certain competencies that managers should expect their new writers to have when they start working. By looking at commonalities in the core curricula of technical writing undergraduate programs, technical writing managers can form reasonable expectations for what their new employees should know coming out of technical writing programs, and these commonalities can comprise an expected baseline knowledge for those just entering the field of technical writing.

One important question to ask is how this baseline knowledge in academic technical writing competencies compares with practitioners' experience. For example, do entry-level employees lack skills that are commonly excluded from undergraduate courses? Do they lack the skills that are included? To answer these questions, it is necessary to look to the field and ask technical writing managers what problems and successes they find with their new and less experienced employees. With this in mind, my research seeks to answer these questions:

1. What skills are entry-level writers expected to have at the time of hire?
 - a. What expectations do academic programs set?
 - b. What do managers expect?
2. Of these skills, what do managers find that their entry-level writers have or lack?

Based on the results of these research questions, I will offer recommendations and possible actions for technical writing managers to develop their entry-level employees.

Literature Review

Discussing technical writing core competencies is hardly a new topic in the technical writing academic community, and much has been written about the essential skills and knowledge areas of technical communication. Hayhoe (2002) defines the field's core competencies as knowledge management and creation, information design, proficient communication in various media, and involvement in a technical writing learning community. Several studies in the past have looked to technical writing managers and technical writing curricula to better understand what writers should know when they enter the field (Whiteside, 2003; Rainey, Turner, & Dayton, 2005; Kimball, 2015). Many of these discussions are directed at what academic programs need to do in order to make curricula fit the needs of managers.

Whiteside (2003) surveyed recent technical writing graduates and technical writing managers in order to understand from both perspectives in what ways new technical writers were not ready for the workplace. Both recent graduates and managers in Whiteside's (2003) study believed that recent graduates lacked understanding in business operations, project management, problem-solving skills, and scientific and technical knowledge. Over half of the managers in Whiteside's study indicated that their new writers had good foundational knowledge of written and oral communication as well as software knowledge, though the recent graduates believed their software skills were lacking.

Kimball (2015) asked what technical writers need in terms of education, training, and credentials before they are hired and how their skills can be developed further once they are in the workplace. Kimball (2015) found that the skills managers most valued were content development, writing, critical thinking, audience analysis, and communication strategy. Similar to Whiteside (2003), Kimball found that in addition to more traditional writing skills, technical communication managers valued business and project management skills.

In addition to consulting technical writing managers, Rainey, Turner, and Dayton (2005) analyzed the core requirements of ten technical writing undergraduate programs and used their findings to form questions for technical writing managers. From their close look at the programs, they found that the most significant skills from managers' perspectives were the ability to collaborate, to write for a specific audience and purpose, to learn technology, and take initiative in work. Rainey, Turner, and Dayton found that the secondary skills managers desired included "skills in using technology to accomplish documentation work in various media and the ability to write, edit, and test various technical communication documents" (p. 323, 2005).

These sources conclude that much of, though not all of, previous research indicates that managers see a need for new technical writers need to develop skills and business expertise in project management and teamwork. One of the aims of my work is to provide an updated response to the questions posed by previous researchers. As the field continues to grow and change with technology, it will be essential for researchers to continue to study managers' experiences so that technical writing programs can also grow to meet the needs of students and their future employers.

Research Methods

Undergraduate Course Evaluation

In order to determine academic expectations for entry-level writers, I reviewed the required core coursework for a sample group of six technical writing undergraduate programs. I used the Council for Programs in Technical and Scientific Communication website (<http://www.cptsc.org/programlist.html>) to review a listing of academic programs with ties to technical writing certificates and undergraduate and graduate degrees. Some programs were entirely focused on technical writing, and others included technical writing as a possible emphasis or track within an English or professional writing degree. From this list, I selected a small sampling from the undergraduate programs that offered a Bachelor of Arts or Bachelor of Science degree that included either "technical communication" or "technical writing" in the name of the degree. I used these criteria and reviewed the degree requirements in order to eliminate certificate programs and other degrees like English or engineering that had a technical communication track or emphasis but were not primarily dedicated to study in technical communication. I also limited my selection to programs in the United States. The programs reviewed for this study include University of Minnesota, Metro State University, Missouri

University of Science and Technology, University of North Texas, Minnesota State University Mankato, and University of Arkansas Little Rock.

After I selected these six schools, I reviewed the degree requirements listed on the programs' websites and narrowed my focus to the core classes for the degree that all students in the programs were required to complete. While six schools is not a comprehensive list of programs that would meet the criteria for the study, the recurring courses indicated that it was a sufficient sample size. I did not evaluate the elective technical writing courses for these programs, though they included additional competency areas for technical communicators that the core courses of the programs did not address. I placed my focus on what universities identify as essential technical writing skills and did not evaluate the courses that were optional.

I recorded information about the required core courses in a spreadsheet that listed the name, number of credits, and description of each core course. I reviewed information from the course catalog or the course description on the program's website to understand what kind of content was included in the core courses. After I created a list of the courses and their descriptions, I looked for common themes among the programs' courses. I labeled each course with one or more of the following categories: editing and style, visual and information design, audience analysis, research, web writing, policy and procedure writing, genre writing (for example specific document types such as technical reports, technical descriptions, memos, and so on), usability, rhetoric and writing theory, internships, capstones, and topics courses. I categorized topics courses as specialized courses that were unique to one program and did not fit another category, such as instructional design, persuasive writing, and linguistics. Table 1 shows an example of one program to demonstrate how each program's required core courses were reviewed and assigned one or more competency categories.

Table 1: University of Minnesota required core technical writing competencies

Course	Number of Credits	Description from course catalog	Competency category
Introduction to Technical Writing and Communication	3	Research origins/history. Technical communication. Audience, purpose, ethics, global communication, collaboration, usability, digital writing technologies. Journal articles, student/professional organizations, guest presentations, interviews, digital portfolio. Oral presentations, research.	Audience analysis Usability Research
Communication Modes and Methods	3	Theories and practices of interpersonal, small group, organizational, and scientific and technical communication. Lecture, discussion, simulations, small group work.	Rhetoric/writing theory
Editing, Critique, and Style	3	Editing for style, correctness, and content. Grammar/punctuation, Copyediting/proofreading. Working with a writer to develop, organize, write, and polish a document. Editing technical/scientific information. Paper/electronic assignments.	Editing and style
Technical and Professional Writing	4	Written/oral communication in professional settings, gathering research, analyzing audience, assessing/practicing multiple genres. Draft, test, revise present findings in oral presentation.	Audience analysis Research Genre writing
Visual Rhetoric and Document Design	3	Rhetorical principles applied to visual displays of information/data in print/online documents. Analyze/create examples of visual communication/design for selected documents combined with various writing strategies.	Rhetoric/writing theory Visual and information design
Rhetorical Theory for Writing Studies	3	Principles/history of rhetorical theory/criticism. Classical theories. Aristotle's Rhetoric applied to examples of contemporary communication. Relationship of classical theory to scientific discourse, technical communication.	Rhetoric/writing theory
Usability and Human Factors in Technical Communication (Students may choose between this course and Writing with Digital Technologies.)	3	Principles/concepts of human factors/usability testing. Developing objectives, criteria, and measures. Conducting tests in lab, field, and virtual environments. Using software programs to analyze qualitative/quantitative data.	Usability
Writing with Digital Technologies (Students may choose between this course and Usability and Human Factors in Technical Communication.)	3	WRIT 4662W is an advanced level Writing Studies course that explores various digital writing technologies and provides multiple opportunities to assess writing situations and make appropriate decisions about digital form and production. Students will learn the basic building blocks of writing in Internet environments (text, sound, images, video) as well as the vocabularies, functionalities, and organizing structures of Web 2.0 environments, how these impact understanding and use of information, and how to produce these environments (i.e., multimedia internet documents) for interactivity and use. This course includes design projects and practice with apps, markup language, content management systems, video, and social media.	Web writing

Surveying Technical Writing Managers

In order to gather information about what technical writing managers experience in the field, I determined that a survey would be the best method because it would allow me the convenience of posting a link to an online technical writing forum or group and gather responses.

I believed that a survey would allow me to collect more responses because it would require less of a time commitment from my respondents than a more traditional face-to-face or phone interview. Additionally, I selected a survey format because it allowed me to collect quantitative data about certain skill sets as well as more specific qualitative data that respondents entered into open text fields to elaborate on their responses. My qualifications were that respondents must be managers who directly supervise the work of entry-level technical communicators. These requirements were listed on the introductory page of the survey in order to allow potential respondents to opt out if they did not fit the criteria. Because the survey was anonymous, respondents self identified, and I was not able to verify their background or work experience. For the purposes of my research, I defined “entry-level” as an employee with 0-2 years of previous work experience in technical communication.

I created my survey using Qualtrics (Qualtrics, Provo UT), an online survey program. After I created the survey, I recruited respondents by getting referrals from acquaintances who knew technical writing managers. I also posted my survey link to technical writing groups on LinkedIn and Reddit in order to gather more responses.

In order to understand the expectations of technical writing managers with their entry-level employees, the survey asked technical writing managers what common technical writing skills they expected entry-level employees to have coming into the job and the level of proficiency they expected. In the first section of the survey, managers selected the proficiency level they thought new writers should have in a given skill in one of the nine competency areas. The possible proficiency levels were no skill, some familiarity, a working knowledge, and fully proficient. Managers also had the option to indicate when they did not think a competency was applicable. In the second section of the survey, I asked managers to describe their experiences

with new writers' skills in each of the nine competency areas. Managers were asked to elaborate on the skills that they commonly found that these less experienced employees had or lacked.

Findings

Course Evaluation

Of the six undergraduate programs, the number of required semester core credits ranged from 19 to 39. Based on the course catalog descriptions for each program, there was a total of nine core competencies in the six programs: research, editing and style, visual and information design, web writing, usability, audience analysis, writing and rhetoric theory, policy and procedure writing, and genre writing. In addition to these categories, four of the programs required capstones, and two required internships. Three programs also had topics courses that did not fit into the other competency categories and did not correspond to other programs' courses within this sampling. For example, this included courses about linguistics, instructional design, and other topics.

Of all of the core competencies, courses that either focused on or included elements of genre writing appeared most frequently in this sampling, each program having at least one course that taught elements of genre writing. Genre writing, based on the course descriptions reviewed in this study includes teaching students to write specific types of documents such as technical descriptions, technical instructions, specifications, proposals, reports, and memos. After this category, the two core competencies that appeared most frequently editing and style and visual and information design, each required for five of the six programs surveyed. Competencies in audience analysis, research and web writing were all included in four of the programs, while usability and writing and rhetoric theory were included in three. Policy and procedure writing was the lowest ranked competency in the sample, being included in two programs.

Table 2 – Programs including each core competency

Core competency	Programs with core competency
Genre writing	6
Editing and style	5
Visual and information design	5
Audience analysis	4
Research	4
Web writing	4
Usability	3
Writing and rhetoric theory	3
Policy and procedure writing	2

Survey Results

A total of 11 technical writing managers responded to the survey, but not all 11 respondents answered each question. The survey asked for two main types of responses. In the first half of the survey, respondents were asked to define their expectations for entry-level writers' skill level in certain competencies at the time of hire. All 11 respondents rated the competencies expected at the time of hire. 8-10 respondents answered the questions with open text fields. Each competency was broken into two or more subcategories to allow respondents to be more specific about their expectations for a variety of skills within the competency. For each skill, respondents were asked to rate their expectations on a Likert scale, selecting one of the following proficiency levels:

- No skill
- Some familiarity; needs training
- Working knowledge; minimal guidance needed
- Full proficiency; works independently
- N/A; this skill is not necessary

The second half of the survey asked managers about what they typically found entry-level writers' skill level to be for the broader areas of the nine competencies. Respondents were able to type short answers to provide specific descriptions of their experiences. Additionally, one question of the survey asked respondents to elaborate on skills that were not addressed in the survey that they believed were necessary for new technical writers to have.

The highest expectations for full proficiency in a competency area were for editing and style. Most managers expected full proficiency or a working knowledge in appropriate grammar use. Within this category, respondents also had higher expectations for editing and proofreading skills, with 9 of 11 respondents expecting either full proficiency or a working knowledge. Additionally, this competency area was one of two in the survey to which all respondents expected employees to have at least some skill, the other being visual and information design.

Table 3: Manager expectations for editing and style competencies

Editing and style competency	No skill	Some familiarity	Working knowledge	Full proficiency	N/A
Ability to edit and proofread	0	2	3	6	0
Ability to use grammar appropriately	0	0	3	8	0
Ability to effectively use voice and style	0	4	3	4	0
Ability to apply style guidelines appropriately	0	2	5	4	0

Most managers indicated that the employees that they hire do have at least some editing skills at the time of hire. Eight of nine respondents to this question said that their writers had these skills, and one indicated that it varied by person. One unique thing about this competency is that it is something that managers can screen in a more objective way than some of the other skill areas. Some respondents said that they screen for editing skills or review writing samples during the hiring process that can help them to assess some skills in this area before they make a decision to hire. In this light, perhaps the ability know more about applicants in this competency area also accounts for managers' higher expectations.

Managers' expectations were also high in the competency area of visual and information design. For the categories of using styles and formatting, using headings, lists and white space, and logically organizing information, most managers expected a working knowledge if not full proficiency. Effectively presenting visual data was the skill in this category that was consistently rated lower by respondents with seven of 11 saying that they expected only some familiarity with this skill.

Table 4: Manager expectations for visual and information design competencies

Visual/information design competency	No skill	Some familiarity	Working knowledge	Full proficiency	N/A
Ability to use document styles and formatting	0	2	7	2	0
Ability to use headings, lists, and white space effectively	0	1	8	2	0
Ability to logically organize information	0	2	6	3	0
Ability to effectively present data visually	0	7	2	2	0

Compared with managers' expectations for skills in visual and information design, relatively few believed that their employees actually had these skills at the time of hire. Three respondents indicated that employees generally had these skills, four respondents indicated that employees lack these skills, and three responded that they could not generalize or that these skills were not necessary for certain reasons. For example, one respondent said that employees used templates to achieve visual design or that a user experience or graphic design specialist would be more likely to address the visual aspects of documentation. Other respondents were more drawn to the information design side of the competency, one respondent saying that “[new employees often lack these skills] but they shouldn't. Organizing information is important to technical writing and you should have a basic knowledge of how to do this if a technical writer.” Another respondent indicated a positive experience with new writers' abilities to use basic tools: “Entry-level writers that I hire have basic familiarity with visual and information design skills, and I expect them to be able to create helpful graphics in Microsoft Visio and Microsoft PowerPoint.”

One competency that showed tension between program emphasis and manager expectation was audience analysis. Four out of the six programs reviewed included instruction in audience analysis as a required core competency, yet the three subcategories in this competency showed that the majority of respondents expected entry-level writers to have either no skill or only some familiarity with audience analysis. No respondents expected entry-level writers to be fully proficient in identifying the primary and secondary audiences of a document or in determining the appropriate level of detail to include in a document.

Table 5: Manager expectations for audience analysis competencies

Audience analysis competency	No skill	Some familiarity	Working knowledge	Full proficiency	N/A
Ability to use document styles and formatting	1	7	1	2	0
Ability to use headings, lists, and white space effectively	3	4	4	0	0
Ability to logically organize information	3	6	2	0	0

Out of 11 respondents, managers' responses were mixed when they were asked whether the entry-level employees that they hired typically had or lacked skills in audience analysis. One manager indicated that it was difficult to tell, while another indicated that this skill was not needed. Four managers indicated that employees had at least some skill in audience analysis, often from academic experience. Four other managers indicated that entry-level employees did not typically have skills in audience analysis, one respondent saying "Most have lacked [audience analysis skills] honestly, which isn't good. They should be able to understand their audience well and continue to understand their audience better at a good pace the longer they are with the company." One respondent who works in defense indicated that entry-level writers do not typically have previous exposure to writing for defense, so for this respondent, new employees' audience analysis skills either were not present at time of hire or did not transfer well to writing for the defense industry.

Managers had low expectations for the areas of usability, web writing, and policy and procedure writing. The table in the appendix lists specific results, but most respondents expected employees either to have no skill or just some familiarity in these competencies. Several respondents did not believe that these competencies were necessary for the employees that they hired.

An open-ended question immediately following the competency ratings portion of the survey accounted for areas that the survey did not address but were still of interest to managers. Respondents provided their thoughts about the following question: "What other skills or areas of knowledge not mentioned here do you expect entry-level writers to have or understand at the time of hire?" While the survey assessed the importance of hard writing skills, it was clear that the ability to work in a professional setting and employ soft office skills was also important to managers. Of the 11 respondents, eight indicated that they also expect entry-level employees to have some soft skills, including skills in collaboration, teamwork, problem solving, and critical thinking. One respondent identified as working in the spacecraft industry, and emphasized the importance of soft skills that technical writers need to find information and resolve issues that arise in their work:

I look for technical writers with excellent interpersonal skills, persistence, and trustworthiness. Technical writers at my company must gather information from various scientific/engineering personnel who often have many competing priorities. It is important for technical writers to feel confident asking for help, setting up meetings, adjudicating disagreements, etc. A lot of interesting yet challenging issues can arise when working on a spacecraft program, and technical writers must be persistent in order to see questions/problems through to solutions.

Another respondent also emphasized the importance of new writers' abilities to solve problems in the workplace: "I expect entry-level writers to have the ability to problem solve and to do it well. While many can and are able to problem solve, not everyone can do it well." Still another respondent reiterated the importance of skills specific to technical writing, also indicating that applicants would be required to prove these skills before being hired:

[Entry-level writers] need to be able to act somewhat professional, so previous experience interning in an office is helpful. They need to be virtuoso writers of the language used in technical communication. They must be able to review the work of others and suggest improvements. They should be able to create organized narratives. They must pass a writing test.

Aside from soft skills, respondents also noted that entry-level writers should have experience learning complex software applications and be able to critique to other employees' work, one respondent also noting that new employees should have to prove their grasp on hard writing skills by passing a test. Two respondents commented on the content of the writing, one saying that it was helpful for new writers to have taken courses in other disciplines and to have interests in the subject they write about in their job. The other respondent who discussed content advocated for specialization within technical writing: "They must have domain knowledge. Tech writing has become a cluster of specialized fields—we cannot, any longer, delude ourselves that our skills are so finely tuned that we could write for *any* domain. Pick one and stick with it."

Discussion

Audience analysis finding

To those who have worked in technical writing or studied technical writing, it may not be surprising to hear that managers expect the most in the areas of editing and style and visual and

information design because these areas affect virtually any document a writer produces. Perhaps the most surprising finding that came out of this study is managers' low expectations for new writers' skills in audience analysis, a skill that should also be employed throughout practically any documentation project. The fact that audience analysis is addressed in required core coursework for four of six programs in this study's sampling indicates its importance to these schools. Cargile Cook (2002) also discusses the importance of audience analysis and identifying the audience and purpose for a communication as part of students' rhetorical literacy. Kimball (2015) also found that audience analysis was one of the skills that managers valued the most highly, so while audience analysis is generally seen as a necessity, both by managers and academic programs, managers who participated in this study do not have faith in the skills of new writers.

The reason that managers do not have higher expectations for audience analysis is unclear. One limitation of this study is the number of respondents who were willing to provide feedback on their expectations for new writers. It is possible that these 11 respondents are not representative of technical writing managers in general and that most managers would have higher expectations in this area. Still, not all managers found their new employees lacking either, one indicating that new writers generally had "some exposure but not much practice" in this area. Another manager indicated that "Most of our writers come through either academia or tech comm programs, so [they] have a good grasp of audience analysis skills." Another respondent indicated that new writers lacked audience analysis skills due to a lack of experience in that respondent's particular industry. This response provides another possible reason for low manager expectations in this area. This respondent's comments about a lack of experience in the industry seem to indicate a lack of technical knowledge rather than the inability to analyze an audience in

general. Even writers who do not have extensive background knowledge on a subject should still be able to apply theoretical principles of audience analysis to research the topic and accomplish the writing goals of a specific audience.

Soft Office Skills

The data collected in this study is consistent in several ways with previous research on technical writing and other competencies managers want to see in employees. Managers in Whiteside's (2003) study noted that they found their entry-level employees lacking in soft office skills. My study's primary focus was writing skills, so respondents were not specifically asked whether their new employees had or lacked soft office skills. However, it is notable that multiple managers mentioned some type of soft office skill as an expectation for entry-level writers. Likewise, participants in Kimball's (2015) study actively volunteered desirable skills and qualities outside of the realm of writing including interpersonal communication, independence, and project management. The continued manager interest in soft office skills for new technical writers shows that it is important to continue to check the status of these skills in the technical writing field.

The need for soft office skills is not exclusive to entry-level technical writers. Clearly people in many professions need to know how to work as part of a team, solve problems, and manage projects, so manager interest in this area is not unique to technical writing. As a technical writing manager myself, I can understand why several managers in my survey desired to see employees with skills in project management, problem solving, critical thinking, and the like. These skills help employees to accomplish other writing-related tasks in their work. However, I would not expect entry-level technical writers to excel in these areas unless they had previously worked in an office environment for some time. Practicing skills like collaboration,

project management, or problem solving in a university setting may be a starting point, but how these skills are used in the context of the workplace may be very different. Entry-level employees with advanced office communication and project management skills may be more of a wish list item than a need. If entry-level writers (often recent college graduates) are able to naturally develop non-writing office skills after some time in a professional setting, I would argue that an experiential education is more appropriate than trying to incorporate skills into a technical writing program that do not belong there.

Future Research

As the field of technical communication continues to grow and evolve, it is important to keep looking at what academic programs have to offer and what skills technical writing managers want and expect to see in the candidates just coming out of technical writing programs. While the number of programs reviewed and managers surveyed for this study is too small a number to draw conclusions for the entire field, this information still provides a needed pulse check to the ongoing need for harmony between manager expectations and curricula. With this in mind, I propose several possibilities for further research.

1. Continue to evaluate technical writing curricula and survey managers about their experiences.

While this study's response to Albers (2016) attempts to improve lines of communication between the university and the field, these questions need to be asked on an ongoing basis. In order to know how technical writing programs need to grow, it is essential for program administrators and practitioners to continue to work together to make sure that technical writing students are prepared and knowledgeable in the appropriate competency areas before

entering the work force and that the competency areas that universities are requiring are relevant and beneficial.

2. Revisit the topic of audience analysis.

Another possible area for further research is to determine whether academic programs need to make adjustments in the ways that audience analysis is taught. Again, the low manager expectations in this area could be an anomaly due to the small sample size. However, this competency was included in the core coursework for five of the six programs surveyed, so it seems that most academic programs are already teaching this competency. Academic programs may benefit from managers' feedback about specifically how new writers are struggling in this area after they start working. If there are recurring issues in this area, program administrators may need to reevaluate how this competency is being taught to ensure that students are equipped to apply their learning in this area after they start working.

3. Discuss ways to prepare students with "soft office skills" while they are still in school.

"Soft office skills" is a broad and somewhat vague category, so an important first step would be to better define this category by finding out from managers what non-writing skills are an essential part of work for their new writers. Skills such as problem solving, interpersonal communication, and critical thinking that were mentioned in this study could be part of this, but in order for academic programs to think about addressing this area, research needs to be done to determine what specific non-writing skills are generally helpful for technical writers. Additionally, further research by way of a course evaluation could be conducted to determine whether technical writing programs are already teaching any of these soft skills. Although this study and previous research indicate that managers want employees with some office skills, another pertinent question to ask is whether it is appropriate for technical writing

programs to be teaching these skills or whether other departments have courses that address these competency areas. Another possible way to address the need for office skills would be to make sure that technical writing students have actual office experience before they graduate. Only two of the six program surveyed required internships for technical writing students. Additional study on the usefulness of internships to prepare technical writing students for work would also be relevant in answering this question.

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<http://www.qualtrics.com>

Appendix A: Technical Writing Manager Survey

Dear participant,

My name is Kristin Roberts, and I am an M.S. student at the University of Minnesota in the Scientific and Technical Communication program. As part of a professional practice research course (WRIT 8505), I am seeking to understand the levels of writing competencies that technical writing managers expect entry-level employees to have at the time when they are hired. I also hope to learn what entry-level employees' skill levels are actually found to be after they start working. To this end, I am inviting managers of entry-level technical writers to participate in a survey.

Who can respond to this survey?

If you currently supervise or have supervised (in the last five years) the work of one or more entry-level technical writers, you are eligible to participate. For the purposes of this survey, an entry-level writer is an employee with 0-2 years of previous technical writing work experience at the time of hire. This survey will ask you to rate skills and provide short answers about your experiences managing entry-level technical writers. It should take no longer than 15-20 minutes to complete. The survey will not ask for any identifying information (your name, your employer, etc.). Please do not provide any information of this nature in the survey.

Your participation will provide valuable data that will help identify ways to bridge the gap between technical writing academics and practice. If you would like to receive a copy of my paper, which will discuss the survey results, please email me at robe1348@umn.edu. Thank you for your time and consideration.

Kristin Roberts

The following questions describe several skills that are taught as core competencies in a sampling of technical writing undergraduate programs. Please rate your expectations for the skills of entry-level employees (0-2 years experience) at the time of hire.

Q1 What are your expectations for employees' skills in audience analysis?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to analyze the purpose of a document	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to identify primary and secondary audience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to determine how much or little information to include	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2 What are your expectations for employees' skills in research?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to interview subject matter experts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to locate needed information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to work with hardware or software in order to document it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3 What are your expectations for employees' skills in writing in specific genres?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to write technical descriptions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to write technical instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to write specifications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to write proposals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to write reports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to write memos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 What are your expectations for employees' skills in editing and style?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to edit and proofread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to use grammar appropriately	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to effectively use voice and style	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to apply style guidelines appropriately	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 What are your expectations for employees' skills in visual and information design?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to use document styles and formatting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to use headings, lists, and white space effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to logically organize information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to effectively present data visually	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6 What are your expectations for employees' skills in usability?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to understand principles of user experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to conduct usability tests of documentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 What are your expectations for employees' skills in web writing?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to write and manage web content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to design basic web pages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to code in CSS and HTML	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8 What are your expectations for employees' skills in policy and procedure writing?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Ability to create software user documentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to create hardware user documentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to create employee handbooks and work instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 What are your expectations for employees' theoretical knowledge?

	No skill (1)	Some familiarity; needs training (2)	Working knowledge; needs only minimal guidance (3)	Full proficiency; works independently (4)	N/A; this skill is not necessary (5)
Understand principles of writing theory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understand principles of rhetorical theory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10 What other skills or areas of knowledge not mentioned here do you expect entry-level writers to have or understand at the time of hire? Please elaborate.

Q11 Do entry-level writers that you hire typically have or lack audience analysis skills at the time of hire? Please explain.

Q12 Do entry-level writers that you hire typically have or lack research skills at the time of hire? Please explain.

Q13 Do entry-level writers that you hire typically have or lack genre writing skills at the time of hire? Please explain.

Q14 Do entry-level writers that you hire typically have or lack editing and style skills at the time of hire? Please explain.

Q15 Do entry-level writers that you hire typically have or lack visual and information design skills at the time of hire? Please explain.

Q16 Do entry-level writers that you hire typically have or lack usability skills at the time of hire? Please explain.

Q17 Do entry-level writers that you hire typically have or lack web writing skills at the time of hire? Please explain.

Q18 Do entry-level writers that you hire typically have or lack policy and procedure writing skills at the time of hire? Please explain.

Q19 Do entry-level writers that you hire typically have or lack rhetoric and writing theoretical knowledge at the time of hire? Please explain.

Appendix B: Survey Responses for Skill Proficiency Levels

Expected skill level	No skill	Some familiarity	Working knowledge	Full proficiency	N/A
Audience analysis					
Ability to analyze the purpose of a document	1	7	1	2	0
Ability to identify primary and secondary audience	3	4	4	0	0
Ability to determine how much or little information to include	3	6	2	0	0
Research					
Ability to interview subject matter experts	0	3	7	1	0
Ability to locate needed information	2	3	6	0	0
Ability to work with hardware and software in order to document it	2	3	4	2	0
Genre writing					
Ability to write technical descriptions	0	5	5	1	0
Ability to write technical instructions	0	2	7	2	0
Ability to write specifications	4	1	4	1	1
Ability to write proposals	4	5	0	0	2
Ability to write reports	1	4	4	1	1
Ability to write memos	2	3	1	4	1
Editing and style					
Ability to edit and proofread	0	2	3	6	0
Ability to use grammar appropriately	0	0	3	8	0
Ability to effectively use voice and style	0	4	3	4	0
Ability to apply style guidelines appropriately	0	2	5	4	0
Visual and information design					
Ability to use document styles and formatting	0	2	7	2	0
Ability to use headings, lists, and white space effectively	0	1	8	2	0
Ability to logically organize information	0	2	6	3	0
Ability to effectively present data visually	0	7	2	2	0
Usability					
Ability to understand principles of user experience	2	7	2	0	0
Ability to conduct usability tests of documentation	4	4	2	0	1
Web writing					
Ability to write and manage web content	2	3	2	1	3
Ability to design basic web pages	2	6	0	0	3
Ability to code in CSS and HTML	2	4	0	0	5
Policy and procedure writing					
Ability to create software user documentation	1	6	2	1	1
Ability to create hardware user documentation	3	5	1	1	1
Ability to create employee handbooks and work instructions	3	5	2	1	0
Theoretical knowledge					
Understand principles of writing theory	0	4	3	3	1
Understand principles of rhetorical theory	3	5	2	0	1