SUMMARY

◆ **Provides a framework of experiences and skills employers call for in job postings**

◆ **Shows that potential employers are seeking very technical or domain-specific knowledge from technical writers**

◆ **Shows that specific technology tool skills are less important to employers than more basic technical writing skills**

Analysis of the Skills Called for by Technical Communication Employers in Recruitment Postings

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INTRODUCTION

Technical communication educators are constantly pursuing information to help them better serve their students. These pursuits manifest themselves in different ways. For example, there are special issues of the leading journals in the field dedicated to subjects such as assessment (Hundleby, Hovde, and Allen 2003) or education (Barnum 2006). There are organizations and conferences devoted to the understanding of how to educate technical communicators more effectively (Association of Teachers of Technical Writing and the Council for Programs in Technical and Scientific Communication, which both sponsor conferences on educating technical communicators). There are sessions focusing on this topic held during the conferences of each of the major trade/professional organizations (Society for Technical Communication and IEEE Professional Communication Society). Clearly, the subject of educating technical communicators is not exhausted.

Of particular importance is better understanding what technical communication students need to learn. What skills will they need to gain employment, to excel in their positions, and to make sensible, rhetorical, and ethical decisions?

Gaining such knowledge is not an easy task. For example, often scholars are divided about what even counts as fundamentally important education for technical writing students. Some suggest we should teach applied practical concepts, such as the latest software or methodologies. Countering this approach are those who believe that students should be taught important rhetorical theories as a foundation on which workplace skills can later be built (probably in the workplace). Perhaps stemming from different beliefs regarding the primary job of the academy (for a comprehensive discussion, see Kim and Tolley 2004), these two points of view are equally important.

Epistemology aside, all educators are aware that more information is needed; thus, many studies have been conducted to better understand the necessary elements for becoming a successful technical writer. Such studies have been conducted by surveying students, curriculum, and/or professionals and employers in the field (Conklin 2007; Giammona 2004; Hart and Conklin 2006; Kim and Tolley 2004; Rainey, Turner, and Dayton 2005; Whiteside 2003; Wilson and Ford 2003).

These studies have resulted in a wealth of rich detail about the skills needed by technical communicators according to those practitioners (new and experienced), employers, and programs. They have subsequently contributed much to the shaping of technical communication curricula in many other education programs.

However, when researching the needed skill sets for technical communicators, these studies primarily used surveys, interviews, or focus groups (or a combination). As with any research area, it is important to seek new avenues from which to draw data to, at the very least, check the accuracy of previous findings conducted with different methodologies.

At the same time, it is also important to attain a greater number of participants than were previously studied. While prior research gained a rich amount of detail from smaller groups of participants, a larger number may increase the confidence in the findings.

However, regardless of the size of previous studies or their similar methodologies, what is striking is how closely their findings align. Of note is that each of them point out similar skills needed by technical communicators. Below lists the skills that were discussed by the findings of at least two studies published since 2000.

Experience: Wilson and Ford (2003) point out the importance of workplace experience (through either internships or real-world assignments), as do Whiteside (2003) and Kim and Tolley (2004).

Specialized or technical knowledge domains: pointed out by Whiteside (2003), Kim and Tolley (2004), and Giammona (2004) as helping new technical communicators either find and gain employment or helping them both

understand the subject matter and the information gained by talking to subject matter experts.

Technical writing-specific knowledge: Kim and Tolley (2004) and Rainey, Turner, and Dayton (2005) both discuss the importance of understanding and writing to a specific audience. Giammona (2004) lists understanding readers and being user-oriented as important.

Technology tools knowledge or skills: although Kim and Tolley (2004) make it a point to state that there is no specific technology needed, they do highlight the importance of generally knowing the types of technology used and the ability to learn needed technology quickly. This finding is further echoed by both Giammona (2004) and Rainey, Turner, and Dayton (2005).

Project management skills: interpersonal, collaborative, and team situations (Conklin 2007; Giammona 2004; Hart and Conklin 2006; Kim and Tolley 2004; Rainey, Turner, and Dayton 2005; Whiteside 2003), general business knowledge (Conklin 2007; Giammona 2004; Whiteside 2003; Wilson and Ford 2003), and being independent and a self-starter (Giammona 2004; Kim and Tolley 2004; Rainey, Turner, and Dayton 2005).

The fact that more than one study posted the same finding increases confidence that educators should be focusing on that particular skill. However, it is still important to understand how widespread the above results really are before making curriculum changes. Furthermore, as suggested by Whiteside (2003), constantly researching the needs of students is important and necessary. This study attempts to better understand how widespread the above skills are by looking at the skills and requirements listed in a set of Internet employment ads. The next section discusses the method used and specifically discusses job ads as a source of data.

RESEARCH AND METHODOLOGY

This study uses the information found in the skills/qualifications sections of job postings soliciting technical writers. The use of job posting presents an ideal solution to the problem pointed out by Rainey, Turner, and Dayton (2005) with regard to conducting research dependent on technical communication professionals. In their study, they invited 587 listserv subscribers to participate in their research. However, they were only able to get 67 to fully complete the survey. By using job postings, I was able to analyze the contents of 327 job ads in total, thus providing a larger data set that takes into account the opinions of those in the professional sector. The next section discusses the use of job postings as a data source.

Internet employment postings as sources of information

Internet employment postings on employment sites such as Monster.com are becoming an increasingly pervasive method for recruiting. According to a 2002 study (already considered out of date by some), 90% of Fortune 500 companies used some type of Internet recruiting method, whereas the fees spent on newspaper and traditional forms of recruiting dropped 20% (Feldman and Klass 2002). The convenience of accessing hundreds or thousands of postings, and the rapid increase of online recruiting practices by employers, make Internet employment postings a rich and meaningful source of information for research to inform program design.

Although rich in data, some may question the reliability of such ads. Where do they come from and how are the details within them defined? One may imagine a potential supervisor or human resources manager creating an arbitrary list of job skills to be possessed by the employee, thereby making a "wish list" of sorts for their ideal candidate. In fact, however, there is a large body of research dedicated to understanding the skills required for performing different jobs. Within the human resources discipline, job analysis research is recognized for its importance in identifying the various facets of occupations (such as descriptions of the job and its duties and what is needed to carry them out). Various job analysis techniques exist, such as functional job analysis or threshold trait analysis (Levine and others 1983).

These job analyses are used to identify the skills required to perform a particular job. The results of such analyses are used to create "selection schemes, training programs, or performance evaluation systems" (Landy and Vassey 1991, 27). The first of these, "selection schemes," is of concern here. In other words, before a job ad's content is created, a job analysis is performed to create both a description of the job and the skills required. These in turn are used to measure potential applicants.

Many techniques are used in job analysis, but common to most of them are methods that include subject matter experts (SMEs). These particular SMEs are potential supervisors and people occupying the current position. Human resources personnel conduct interviews and observations or submit surveys and questionnaires, all in an attempt to better understand the occupation and what is required to fulfill its duties.

Thus, many job ads will be the result of this type of analysis, and theoretically, the data is as reliable as the information reported in past research that was gathered through the interviews, focus groups, or surveys of employers and professionals. Therefore, although only being as reliable as the opinions of those who wrote the ads, one can still assume that as a data source the information within those ads will not stray from the reliability created in previous studies.

Employment postings have been used previously in numerous studies to better understand the expectations of

employers within disciplines. Mahaffy and Caffrey (2003) analyzed employment postings in a discipline-specific, printed employment bulletin to identify the demand for particular requirements among the positions for instructors in sociology. Similarly a different study attempted to identify common skills needed by event planners (Arcodia and Barker 2002). The study reported in their article analyzed 100 Internet employment postings to find competencies commonly required by employers.

Employment ads have been especially useful in understanding the evolution of a field or the current status of a particular profession (see, for example, Gallivan, Truex, and Kvasny 2004; Todd, McKeen, and Gallupe 1995). One particular study by North and Worth (2000) analyzed employment postings from 10 metropolitan areas over a 6-year period to understand how the requirements for certain competencies may have changed.

The study by North and Worth (2000) differs from this study in many important ways. The purpose of their study was to test the accuracy of results from the 1991 U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills, whereas this study hopes to match the skills and requirements called for in job ads against those pointed out by previous studies specific to technical communication. Furthermore, within their study, North and Worth studied job ads for business or professional occupations. This study, however, focuses only on ads for technical writers, thereby making the results more significant to our field.

Hence, Internet employment postings can provide a window to current, employer-based needs for new or experienced technical communicators. Such an analysis provides researchers with a broader population than might otherwise be found, and although any method has its limitations, this method does allow for a rewarding data set.

Method used

From August 1, 2006 until October 31, 2006, I collected a total of 1,399 employment postings. For the specified time period, each day I viewed new postings placed in the Monster.com employment database. Using the site's search feature to query "technical writer," details of the new ads posted each day by 5:00 pm Pacific time were documented.

When I began this study, I immediately noticed that varying terms were often used for the occupations filled by technical communicators. This phenomenon was also noted in the study by Rainey, Turner, and Dayton (2005), in which case participants (technical communication professionals) self-identified themselves in 16 different ways. Because not all titles indicate the same profession at all locations (calls for usability experts might mean technical communication majors or cognitive psychology majors), I

specified "technical writer" to ensure unity among the positions I copied and analyzed.

Although other employment search engines exist (including government ones), such as HotJobs, CareerBuilder.com, or USAJOBS, I used Monster.com because most employment posting search engines perform the same functions and because Monster.com has emerged as one of the most robust and widely used Internet job boards available (Pont 2005), and I was already very familiar with Monster.com's features. Using an e-mail agent to automatically collect new ads as they were posted might have been more convenient than hand copying each new posting; however, I quickly found that it works by way of keywords and was soon receiving ads for "technical editor" or "documentation specialist" instead of what I had specified. Hence, every evening, I hand copied the newest ads posted in the database and pasted the information into an Excel spreadsheet. The spreadsheet had four main columns: date, company, job description, and job qualifications.

Every attempt was made on my part to ensure that duplicate ads were not copied. However, after the 3 months of copying ads, I went through the spreadsheet and created a refined spreadsheet without duplicate ads. This spreadsheet contained a total of 1,399 employment postings.

I further reduced the number of ads to analyze by selecting those according to criteria that would define them as suitable for new technical writing graduates. Thus, I selected for inclusion only those indicating ≤2 years of experience as a technical writer (I assumed that many new graduates could claim as much with part-time experience, class work, and internships and co-ops). I also excluded those requiring a specialized, technical degree (such as chemistry or engineering). Finally, I excluded those with no information about the type of industry in which the candidate would be employed. My final data set included 327 employment postings.

I collected demographic data by analyzing the job ad and the employers to understand the industry in which the technical communicator would be employed. As shown in Table 1, the job postings represented a broad spectrum of industries within which technical communicators work.

I coded each posting by creating an Access database form and selected appropriate radio buttons in the form that corresponded to information in the job ad. The form contained categories I had devised before the study. Each category (Table 2) represented one of the five skills pointed out in two or more of the previous studies. I further broke down each category into more specific subcategories by using the axial coding mechanism of Flick (2003), in which subcategories are created by matching patterns of the most heavily populated areas of the categories. The categories (with their specific subcategories and definitions) are shown in Table 2.

After the categories and subcategories were created, the subsequent table was imported into Excel for analysis. The following section discusses the primary results from this analysis.

RESULTS

Many of the postings asked for at least some type of technical writing experience (Figure 1). Of the 327, 125 postings (38%) required or desired some previous, general technical writing experience. This type of experience was not specific or did not require a particular type of role for the writer. Simply put, these positions asked that the candidate has carried out technical writing duties in the past.

Only slightly less required were both subject matter experience and subject matter writing experience. Employers required or desired some type of experience with the subject matter about which the candidate will be writing 33% of the time (108 of 327). Hence, if a candidate will be writing in the software environment, employers wanted to see that they have experience with the type of software environment about which they will be writing.

Similarly, 112 of the postings (34%) required or desired the potential writer to have experience writing about the specific subject matter that the current job involves. Hence, again using the above example, if the candidate was applying for a software documentation job in which they were going to be writing application programming interfaces (APIs) or online help, many of the positions required or desired that they have written such types of documents for the related types of subject matter.

A portion of the postings also called for technical or specialized knowledge or experience (Figure 2). A handful of the ads (5; or 2%) asked for candidates who were bilingual in languages including French or Spanish.

Of the 327 postings, 23 (or 7%) required or desired either knowledge or working experience with a computer language of some type. The languages mentioned included Java, C++, C#, and JavaScript. Nine of those requiring or desiring a language specified a variety of languages that a candidate could know or have experience in (such as Java, C++, or C#).

Markup languages were required or desired by 56 (or 17%) of the postings. Markup languages included HTML, SGML, and XML. I also included in this category language or knowledge related to Web work, such as CSS.

Finally, more than one quarter of the postings (26%; or 86 ads) required or desired specific or significant knowledge about the subject matter. For example, if a technical writer was going to write in the software environment, the employer required or desired that the candidate understands facets of the environment, such as the development life cycle or the structure of the databases to be documented. In each case, more than a basic understanding was wanted by the employer.

TABLE 1: DIFFERENT INDUSTRIES REPRESENTED BY THE JOB POSTINGS

Industry	Number of postings
Aircraft/aerospace/aviation industry	13
Biotechnology	1
Chemical industry	1
Engineering consulting	20
Financial industry	19
Food services	1
U.S, state, or local government	6
Information technology	93
Instructional design	5
General manufacturing	14
Marketing	3
Medical device industry	15
Medical services	6
Mining industry	1
Pharmaceutical industry	17
Retail sales	1
Software development/manufacturing	86
Training	1
Hi-tech manufacturing	24

Similarly, some employers also asked that candidates understand basic or specialized technical writing/communication conventions (Figure 3). Understanding or being familiar with specialized writing formats and rules was required or desired by 34 (or 10%) of the employers. These special formats and rules can be found in the aircraft industry, which must follow specific requirements for doc-

umenting its products. Similarly, many U.S. Government contractors require their writers to understand Mil-Spec documentation guidelines. Last, being familiar with particular style guides—such as the Chicago Manual of Style—would also fall into this category.

Having basic technical writing skills was required or desired in 57 (17%) of the postings. These skills include things like understanding an audience or being able to select the important information out of a set of information units. This category also included things like "basic editing skills" and "design documents for a variety of readers."

Combining specialization with technical writing skills, the third category (specialized genre familiarity) was required or desired by 78 (or 24%) of the employment postings. Employers wanted candidates already familiar with particular types of documents, such as standard operating procedures, online help, or APIs.

Various types of specific software tools were required or desired by the employment postings (Figure 4). Online help authoring software, such as Robohelp or Flare, was required or desired by 51 (or 16%) of the postings. Graphic software tool knowledge, including software tools such as PhotoShop and MS Visio, was required or desired by 81 or 25% of the employment postings. A more general category, specialized software tools, was required or desired by 67 (20%) of the postings. This category included software tools often very specific to a particular industry, such as computer aided drafting (CAD) software like Pro/ENGI-NEER or statistical software like SPSS.

Many of the postings, 111 (34%), required or desired knowledge or experience with a specialized desktop publishing software, such as FrameMaker or InDesign. By far the most required or desired, however (at 241 or 64%), were items that I placed in the category of general software tools. In this category, I placed those tools that I felt could be accessed by most everyone, such as (and often seen in the postings) the MS Office Suite of tools.

Many of the postings also called for knowledge in various project management skills (Figure 5). Such skills included multi-tasking skills (31; or 9%), understanding and handling deadlines (31; or 9%), analytical or critical thinking skills (40; or 12%), collaborative skills (51; or 16%), and interpersonal skills (55; or 17%).

By far the most requested or desired were "excellent communication skills"—a vague term often used in the postings. More specific postings called for excellent writing or speaking skills and a "firm grasp of the English language." In this case, 126, or 39%, of the postings requested such skills.

Some of the findings in this section were wholly expected, yet some others were surprising to find. To better understand the results of this study, the following section discusses many of the more notable points presented here.

DISCUSSION

Some experience necessary

Experience was recognized in previous studies by both the practitioners (former students) interviewed and in the responses from managers and those with much industry experience. Participants in the study of Wilson and Ford (2003) stated that they wished they had more experience before entering the workplace, because it would have better prepared them for the difference between professional and academic writing. This was reiterated in the studies by Kim and Tolley (2004) and Whiteside (2003). From the manager's perspective, Rainey, Turner, and Dayton (2005), Whiteside (2003), and Giammona (2004) all had study participants state that new technical writers had some form of workplace experience.

Thus, the results of the experience category—that employers want and value experience—are not at all surprising, and I think that many programs do a good job of preparing students through outlets to gain experience, such as through internships and/or client- or service-based projects. However, it is clear that valued almost as much as or more than general technical writing experience (34%) is some sort of specialized experience (33% for subject matter experience and 38% for subject matter writing experience). This was explicitly pointed out in Kim and Tolley (2004), Rainey, Turner, and Dayton (2005), and Whiteside (2003). The suggestion in those articles, however, was that should a student desire to go into a specialized area, such narrow focus would help.

I agree with this assessment but conclude that this basic guideline should be taken further and strongly recommend that, if students are going to take the time to gain experience (which clearly they should), they should be encouraged to make that experience as specialized in the area of their interest as possible. Doing so would only make them that much more desirable in the job market. Plus, it is also clear that employers value candidates with a good understanding of the subject matter in which they work.

Subject area knowledge is important

Whiteside (2003) discussed in her study a respondent suggesting that useful to a new technical writer would be "technical environment understanding" (311). This reflects the trend that technical communication is moving away from a "Jack of all trades" model, where technical writing is a very generalized concept, and toward a model that is more specialized and contextually defined. Giammona (2004) likewise found participants stating that new writers

TABLE 2: CATEGORIES AND SUBCATEGORIES IDENTIFIED IN JOB POSTINGS

Category	Subcategory	Description
Experience	Technical communication experience	Any unspecified, general technical communication experience required or desired by the employer
	Subject matter experience	Experience with the subject for which, or about which the candidate will be writing
	Subject matter writing experience	Experience writing about the specific subject for which the candidate will again be writing in this position
Technical knowledge/ experience	Computer language knowledge/experience	Knowledge, experience or proficiency in specified computer programming languages as required or desired by the employer
	Markup language knowledge/experience	Knowledge, experience or proficiency in specified markup languages as required or desired by the employer
	Subject matter knowledge	Knowledge about the specific subject for which, or about which the candidate will be writing, e.g., business, pharmaceuticals, healthcare
	Foreign language knowledge	Proficiency in a specified foreign language
Technical writing-specific knowledge	Specialized writing formats/rules	Knowledge of specified, specialized writing formats or rules, such as ISO 9,000 standards, MIL-SPEC, or Aircraft Industry Standards
	Specialized genre familiarity	Familiarity or proficiency with unique or particular genres, such as SOP's, grant proposals, or software documentation
Technology/tool knowledge or skills	Technical writing skills	General skills specific to technical writers, such as audience analysis and creating audience-specific text
	Specialized publishing software	Publishing software tools, unique to technical writing (such as Adobe FrameMaker) required or desired by employers

TABLE 2: Continued

Category	Subcategory	Description
Specialized graphics software	Graphic software tools, such as PhotoShop or MS Vizio required or desired by employers	
Online help software	Specialized software tools designed to create and publish online help files (such as RoboHelp) required or desired by employers	
General software knowledge	Any type of software tool commonly found on office computers, or on the computers on which students typically train (all of MS Office Suite) required or desired by employers	
Specialized software knowledge	Software tools unique to particular types of fields, such as Auto Cad software, required or desired by employers	
Project management Skills		
	Collaborative skills	Skills and experiences in carrying out collaborative or group projects
	Interpersonal skills	Being able to engage in communication with people from different disciplines (such as subject matter experts)
	Analytical skills	Or critical thinking skills
	Communication skills	Written or oral communication skills
	Multi-tasking skills	Being able to work on multiple projects/documents or assignments
	Deadline oriented	Being able to work according to strict project deadlines

would benefit from experience within the industry they are going to write for, and Kim and Tolley (2004) related the story of a writer whose supervisor found the participant's background in science more important than her knowledge of computing.

In the technical knowledge/experience category, the number of employers who wanted potential candidates to have knowledge about the subject matter was 26%. The desire for writers with specific technical knowledge domains is even more for those who have specifically written for or worked with the subject matter (38% and 33%, respectively).

Although many technical writers can gain such knowledge on the job simply through writing about it, having evidence (such as classes in the subject matter) would again strengthen their credentials. Kim and Tolley (2004) suggested that "domain knowledge or experience may be especially important when a student wants to specialize in a particular area," because it will both help them get the job and it will "help the candidate understand the culture of
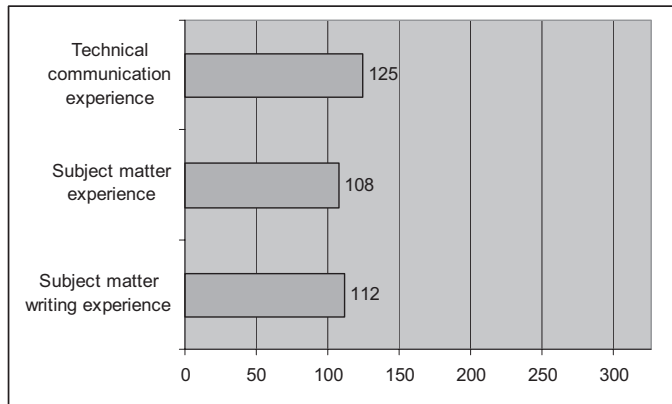
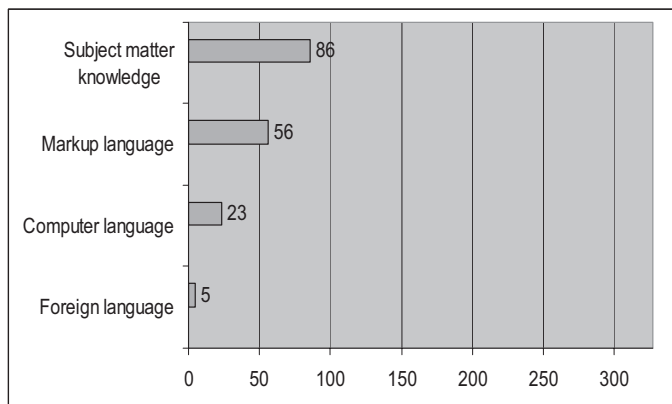**Figure 1.** Amount of calls for experience subcategories.

Figure 3. Amount of calls for technical writing specific knowledge subcategories.

Figure 2. Amount of calls for technical knowledge/experience subcategories.
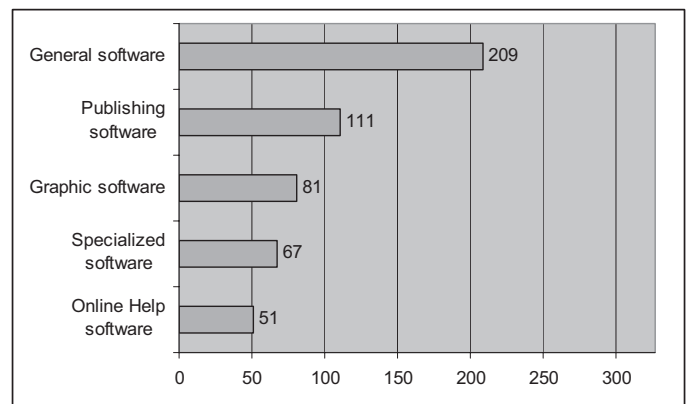
Figure 4. Amount of calls for tool knowledge/skills subcategories.

that community: organizations, practices, values, expectations, and so on" (382).

The question of how this is accomplished was considered by the participants in the study of Giammona (2004), some of whom suggested potential technical writers major in a technical discipline and not writing at all. Other suggested students take one half of their courses in writing and one half in a technical field. In any case, however, it is clearly important. Therefore, like encouraging students to gain specialized experience, students should also be encouraged to take technical or specialized courses or to learn as much as possible about a specific subject area of interest.

Technical writing skills are necessary

Kim and Tolley (2004) pointed out that their participants used both audience awareness and persuasive skills—what I call basic or technical writing specific skills. Rainey, Turner, and Dayton (2005) also listed as a principal recom-
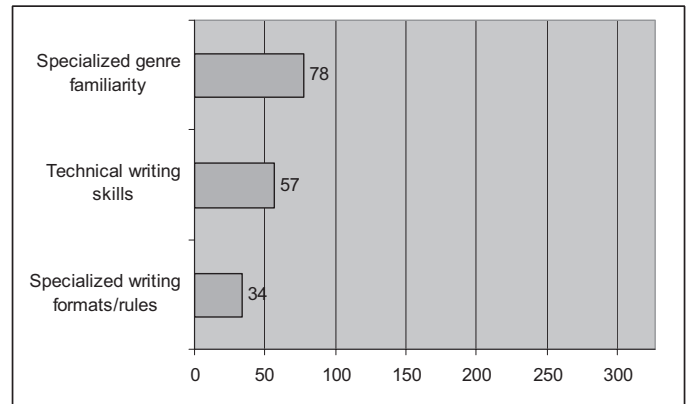
mendation and finding that students need the ability to "write clearly for specific audiences directed by clearly defined purposes" (323). Certainly, it would seem like an obvious skill set for new technical writers.

However, it was a bit surprising to see the low number of postings calling for these technical writing specific skills (17%). After reading the articles discussed above, my assumption was that the request for these skills would be present in a large majority of the postings, but this was not the case. Again there seems to be a trend by employers to want specialized skills, evident by the larger number of postings asking for familiarity with the specific types of documents they work with (24%).

Basing the information in the job ads on the methods included in the second section about how the job ads are created, we must assume that the technical communication managers and professionals who created these ads feel that
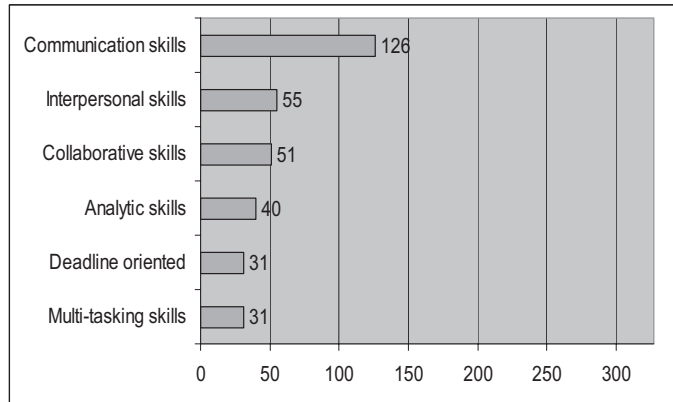
Figure 5. Amount of calls for project management skills subcategories.

specialized skills are more important than general skills. However, this being said, there might also be the assumption that technical writers—especially those degreed as technical writers—will have these skills. After all, a degreed mechanical engineer will most certainly have the math skills required to undertake the assigned tasks; thus, job ads for mechanical engineers leave out these most obvious of skills. The same may apply here.

Technology skills are less important
All studies addressed technology, and all of them highlighted the importance erroneously placed on technology tools. Instead, importance should be placed on other skills, because technical writers—after all—can "learn the key features of a new tool, usually without much formal training, in no more than a few days" (Hart 2007, 22).

However, many of the postings called for proficiency in one or many different types of tools. Compared with the 17% of postings requiring basic technical writing skills, the calls for proficiency in online help software and specialized software tools (16% and 20%, respectively) in the tool knowledge/skills category makes me hesitant to agree with the findings of previous studies. This hesitation is reinforced by the number of postings asking for candidates with some type of specialized graphics software (24%) and publishing software tools (34%). Especially considering that most of the project management skills are required less than specific software tools, perhaps our assumptions about teaching specific tools are wrong or are changing?

With this in mind, however, maybe some suggestions could be made about a couple of items. The software tools, for example, represent an array of different types. The subcategory of graphics software included Microsoft Visio and Adobe PhotoShop. These two tools are vastly different and are intended for two different purposes. Likewise, the

specialized publishing tool subcategory held software like FrameMaker as well as InDesign and Adobe Acrobat. All three of these are different tools and used for different parts (albeit related) of the publishing or writing process. The subcategory of specialized tools held many different random types of tools, including CAD software and different database software (such as Oracle).

Hence implied (and which was pointed out in the previous studies) is that candidates need to know some type of specialized software tool as well as many of the general or commonly used tools (like Microsoft Word). Such knowledge about specific software tools allows writers to quickly adapt to different but related kinds of tools. For example, knowing Adobe InDesign allows a candidate to quickly learn and understand Dreamweaver.

A wide array of project management skills
Previous studies pointed out the importance of many different types of management or business skills. New writers need to understand how to work with deadlines or solve complex problems on their own. They also needed to be able to interact with different people and collaborate effectively.

Thus, it is interesting to note that there are so many subcategories under project management skills and that none of them are very pervasive across all of the job ads analyzed. Perhaps each employer has a different way of defining what they see as important in project management. One could argue, for example, that interpersonal skills and collaborative skills are interchangeable, in which case, 106 (32%) postings are calling for the same thing in different ways.

I would like to point out the last subcategory under project management skills: communication skills. This subcategory quickly became a catch-all for three different requirements: "excellent communication skills," "excellent writing skills," and "excellent oral presentation skills." This is a vague category that seems hard to define and harder still to understand when trying to plan a curriculum that ensures students have such abilities. However, of the project management skills required or desired, it is evidently the most important subset of skills to have.

CONCLUSIONS
Ultimately, more must be done to understand the needs of technical writing students and the demands of the professional organizations for which they will work. As shown here, a convenient and rich source for such information is found in employment postings for technical writers. Considering the methods used to create the postings, they are a great substitute for the technical writing professional, who is often too busy to respond to requests for these types of studies.

However, at the same time, I must acknowledge that job ads are inherently flawed in that we cannot be certain each is created in the manner human resources literature would have us believe. Thus, job ads themselves as a data source should also be better investigated within our discipline. Small samples could be cross-checked with corresponding employers to find out how the ads were created and whether they truly reflect the manager's perception of what is important when hiring technical communicators.

In general, however, confidence in the data source is increased by the many areas where these results intersect the findings from previous studies. Although perhaps not found in the quantity one would expect from the implications of the research performed by Kim and Tolley (2004), Rainey, Turner and Dayton (2005), or Whiteside (2003), all of the skills previously identified as important were also listed as required or desired attributes in the sources for this study. For example all studies, including this one, pointed out the importance of technical writing skills and project management skills. Such common findings help me identify areas to emphasize within the courses I teach.

There were, however, some notable differences that are worth further study. Technology is an area that, in all previous studies, was considered important but not the most important item. Knowing specific technology tools was perhaps the least important. Giammona (2004) even pointed out that such knowledge was emphasized too much by industry. However, in this study, both technologies in general and knowing specific technology tools had enough presence to be considered priorities when entering the workplace. This could an example of the case Giammona pointed out, or it could be that such knowledge is truly important for graduating technical writers.

It could also be that, over the years, certain software programs have gained enough market share to emerge as the standard tools for certain fields and especially within technical communication. Hence, requiring such specific tools is a more reasonable thing to do now than it was even a few years ago. More research in this area needs to be conducted to better understand these findings.

Another important divergence is in the emphasis on specialization. Employers want candidates who understand their subject matter, who have experience in it, and who have written about it. It is not that they expect potential employees to show up with an expert's understanding, but they do expect a level of familiarity. In the many interviews that Giammona (2004) held with technical writing professionals, a theme that arose more than once was the theme of added value. Hart (2007) also stressed that technical writers should focus on their role as knowledge workers. In

either case, understanding the technical subject matter about which they write will both increase their value (as they are more than the "tool jockeys" that Hart laments) and emphasize an important knowledge set: communication about that subject matter.

We still have an immense amount of work to complete before we can really begin to understand what technical communication students need. More studies should be completed, such as longer or more comprehensive studies of this type. Also, because it is additionally important for technical communication programs to focus on the industries in their own regions, this type of study aimed at the employment ads from within that region would also be valuable. T**C**

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