Project:
The Research Paper Toolkit

Planning Documents

Needs Assessment

Overview

In this section, we will discuss the methods we used to conduct a needs assessment involving TCID, IARC, and TECH (PhD) student's familiarity with writing research papers. We followed the methods of Rothwell and Kazanas (2008) when conducting a needs assessment. First, we identify the performance problem, needs assessment objectives, and target audience. Next, we use convenience or judgmental sampling to get a solid sample of the most crucially needed topics within our course. We sent short surveys to students in the Technical Communication program assessing the extent of their knowledge regarding writing research papers at a graduate level. In addition, we interviewed instructors and sent a short survey to the administrators of the program requesting their input on required skills and competencies regarding writing research papers at a graduate level. After acquiring responses from these surveys and interviews, we compiled the information into an assessment of feasibility, in order to determine whether or not our course is relevant to our audience and if we needed to alter any lessons or topics to tailor to their needs.

Performance problem

Graduate students enter the TCID, IARC, and TECH (PhD) programs with varying levels of familiarity with and recent experience with writing research papers. Conducting research and writing graduate-level papers is a competency expected of students in Technical Communication graduate-level courses.

The needs assessment objectives are as follows:

- What skills or know-how are required to write research papers for current Technical Communication graduate-level courses?
- What skills or know-how pertaining to research paper writing do instructors of Technical Communication graduate courses cite as needing improvement among students?
- What skills or know-how pertaining to research paper writing do Technical Communication graduate students feel that they need to improve?
- What skills or know-how would realistically improve the efficiency with which Technical Communication graduate students write research papers?

The target audience includes performers and decision-makers.

- Performers are students taking Technical Communication graduate level courses
    - Masters, PhD, and non-degree seeking students
    - On-site and online students
- Decision-makers are instructors and Humanities Department administrators
    - Decide how research papers will be assigned and evaluated
    - Decide what competencies are expected of admitted students

Sampling procedures

We used convenience or judgmental sampling. This is justified because our populations are very small. Questionnaire and interview questions were designed to be very simple, straightforward,

and brief to generate the greatest response rate possible. Table 1 summarizes the data collection for the Graduate Student Survey and interviews for instructors and an administrator.

Table 1: Data collection summary

Population of interest	Graduate Students	Instructors	Administrators
Sample size (approx.)	26	3	1
Method	Email Survey	Face-to-Face Interviews	Email Interview
Sample selection	53	Karl Matt Jahna	Kathryn Greg
Questions	Graduate Student Survey	Interview Questions for Instructors	Interview Questions for Administrators

Instruments and protocols

- Google Documents was used to develop the survey and open-ended interviews.
- Paper and pen were used for face-to-face interviews.
- A Google Documents form was used to administer the email interview and the survey.
- A TCID, IARC, and TECH (PhD) graduate student email list was acquired from Susan Malgrave, Humanities Department administrative assistant.

The results have been reported to all group members to inform lesson and course design. We can report the results of our assessment to instructors and administrators to promote the future use of our "toolbox." The results will be reported to instructors and administrators as a succinct email memo to promote accessibility.

Methods of data analysis

- Descriptive statistics were used to summarize the students' survey "are you familiar with" questions (quantitative presentation).
- To synthesize the results from all three samples, Table 3 lists commonly cited concerns or themes.

Results of needs assessment

Overall, the graduate students surveyed expressed a need for improvement in most of the skills tested. In a series of Likert scale questions relating to skill familiarity, students rated six of the eight skills with no or low familiarity, on average. Interestingly, students reported on average that they were somewhat or very familiar with conducting research and using a style guide. (Note: 1=No Familiarity, 4=Very Familiar)

Table 2: Student Questionnaire Familiarity Rating Results

Skill	Average rating
Managing References	1.85
Analyzing and interpreting data	1.92
Professionalization	2.08
Versioning Research	2.27
Formatting and Layout	2.42
Finding a topic	2.85
Conducting research	3.12
Using a Style Guide	3.65

In the survey's two open-ended questions, the graduate students surveyed showed interest in furthering their skills in conducting research and writing research papers. Specifically, with respect to improving the efficiency with which they write papers, students most commonly mentioned improving reference management (2), organization (2), conducting better research (3), formatting (2), and more easily finding a topic (2). Overall, students most frequently reported a need to improve upon analyzing/interpreting data (7), conducting scholarly research (3), finding a topic (3), formatting (5), managing references (7), organization (3), planning a timeline (2), professionalization (4), and versioning (3).

The three instructors surveyed had somewhat different ideas on both the most important skills in conducting research and writing research papers at the graduate level and the skills most needing improvement among IIT TCID, IARC, and TECH students. Instructor 1 emphasized the importance of students being able to find a research topic and properly formulate claims about the world, test the claims against observable data, and draw conclusions from the test. He stated that most students have trouble with this because they don't start with a problem but with the data set they want to analyze and, thus, have a hard time finding a topic.

In contrast, Instructors 2 and 3 both emphasized selecting appropriate sources, using sources judiciously, and sharing drafts of the paper with others throughout the writing process. Instructor 2 also said students need to better understand what makes a good research question and how to identify the holes in existing research. To work more efficiently, Instructor 2 thinks students have to know how to schedule time so that they can take a break from writing then come back to it with fresh eyes. Instructor 3 said he thought it was essential for students to know the major journals in the field, know how to retrieve their articles from library databases, and know how to read scholarly articles efficiently and effectively. Furthermore, Instructor 3 says that although most students already know how to use a style guide, many students struggle with managing the sheer number of sources and keeping reading notes.

In our survey to the administrator, we asked two basic questions. First, we asked what skills or competencies related to writing and developing research papers do you think students should have mastered before entering into the Technical Communication graduate program. Our administrator responded by dividing the question into two categories, depending on the level of education the student is pursuing. She states that if the student is in the PhD program, they should already be very familiar with the most popular and related journals in the Technical Communication field. For all graduate students, she states that students should already be familiar with the difference between a personal opinion and an argument that can be supported by evidence within research, as well as argumentative reasoning. She also focused on the fact that a graduate student should already understand the mechanics of writing, especially regarding organization, using visual clues and metalanguage to assist the reader, utilizing appropriate style guides and conventions of Edited Academic English.

We also asked the administrator what advanced skills/competencies related to writing and developing research papers do you expect students to develop during their time in the Technical Communication graduate program. She also divided this question into two categories, depending on the level of education the student is pursuing. If the student is in the PhD program, she believes that, in addition to what all other graduate students will learn after completion of the program, they should come away with the understanding of the difference between the standards and requirements of writing a research paper for a class versus a manuscript submitted to a professional or academic journal. For all graduate students, she outlines skills that will be acquired after completion of the program: reviewing research on a topic and writing a literature review, providing constructive feedback to peers about their drafts, and presenting advanced arguments and supportive evidence. She goes on by stating that all students should become exposed to reading and interpreting experimental literature, as well as recognizing and articulating differences in quality in published research. Finally, she states that all students should be able to develop a research question and understand the methods that would be needed to study it, a skill that she believes is probably the most difficult to master.

Table 3: Commonly cited concerns and themes across the three

Skills that do not require improvement	Skills that require improvement	Skills that would improve efficiency
• Citing sources accurately, using a style guide • Mechanics of writing	• Finding topic, identify research question • Evaluating sources for quality • Versioning • Professionalization	• Managing references • Organization • Managing time

Performance objectives & Performance Measurements

The purpose of this section is to identify the performance objectives & performance measurements for each of the eight lessons within the "creating a research paper" course that we are putting together. The performance objectives will identify what our learners' should know or be able to do after going through our lessons. The performance measurements will identify how we will test our learners' knowledge at the end of each lesson (i.e. multiple choice quiz) to assure that they have grasped the concepts learned. The chart below summarizes our set of performance objectives and measurements for each lesson.

Lessons	Objectives	Task/Quiz
Research	1. Determine sources that both fit the scope of the project and are academically valid 2. Use search terms to find relevant research data 3. Develop an awareness of scholarly research done in the field 4. Create a research time line and learn how to obtain resources from other libraries	Quiz
Finding a Topic	1. Pinpoint a topic that is both relevant to the assignment and reflects your personal interests 2. Formulate an original claim around which to design a study	Task: present learners with an assignment and have them choose a topic that is both relevant and interesting to them. Relevancy will be determined by a set of criteria established by the instructor.
Versioning	1. Determine what information is appropriate for each format 2. Be able to translate research material into each format	Task: present learners with a paragraph from a research paper and have them determine what information would be relevant to a poster
Professionalization	1. Be able to submit a research paper to peer-reviewed academic journals 2. How to apply for an academic conference OR How to find and prepare for an academic conference	Quiz
Formatting Research Data	1. Format raw research data in an Excel spreadsheet for efficient analysis 2. Run basic descriptive statistics in Excel 3. Prepare the document for statistical analysis in the software package PASW (formerly SPSS)	Quiz
Managing References	1. Use Zotero software to manage references 2. Be able to easily cite sources within the paper in a consistent manner 3. Be able to format your references	Task: present learners with a short document and a list of references; have them insert a citation into the document using the software from the lesson
Using a Style Guide	1. Determine which style guide to use for your paper 2. Establish familiarity with the basic terminology within the style guide of choice	Quiz
Formatting and Layout	1. Be able to format and professionally layout your document using LaTeX 2. Understand how LaTeX commands work and how to find and use other commands for purposes beyond the lesson.	Task: present learners with a short document and a short list of tasks to complete to format and layout the document using LaTeX

Learner Characteristic Assessment

In this section, we will discuss our process for evaluating learner characteristics and how learner characteristics will generally affect the construction of our course. Rothwell and Kazanas (2008) outline three types of learner characteristic profiles that can be developed when designing a course: normative, descriptive, and historical. A historical profile is ruled out since it requires an analysis of past participants, since this is the first time we are offering the course. A descriptive profile is limited to the information that we are able to acquire about current students, and cannot predict information about future students to whom this course will be addressed (as the course is offered primarily to new students). As such, we elected to develop a normative profile of learner characteristics that incorporates and is informed by the descriptive information that we were able to gather through out survey.

Rothwell and Kazanas (2008) recommend assessing learner characteristics based on several special considerations. Though not all of the considerations are relevant in an academic setting, many of them are useful in raising special concerns which, in conjunction with assumptions about the users, will influence the design of our course. Our normative profile will be divided into two sections: assumed skills and attributes and special considerations.

Assumed Skills and Attributes

The typical learners have already been admitted to one of the programs at the Humanities department, so we know that they have met the program's admissions requirements. Therefore, we can assume that the learners have an undergraduate degree and are familiar with an academic work environment. They know the rules and regulations and are aware of critical topics such as plagiarism. We can also assume at least a minimum degree of familiarity with research papers and academic articles, although not all learners might be secure in judging their quality.

The graduate students in the Humanities department at IIT have diverse demographic and professional characteristics. The current students who replied to our survey (n=28) range in age from 23 to 57. Most of the learners come from a professional background, sometimes with years of experience. Past job titles reported reflect that students come from a variety of academic and nonacademic fields, as well as career level positions ranging from entry level to upper management. Based on this diversity of past experience, it would be difficult to make broad ranging assumptions about existing skills.

However, we can assume that they will have basic computer skills and know how to use a web browser, fill out web forms, copy and paste text, install software on their computer and are familiar with Microsoft Office applications. Learners without professional experience coming directly from an undergraduate program can be expected to possess these skills as well. Since they chose to pursue a graduate degree with a strong technical focus, learners will be open to or even prefer the use of online learning material.

In general, learners wil probably have a positive attitude towards the course. It is optional, so learners participating in either the online or instructor-led course have chosen to do so out of their own motivation. The benefits they are expecting can be attributed to two different contexts of use. Less experienced learners will take the whole course, presumably in a linear fashion following the given course structure while more experienced or returning learners will browse and pick specific parts of the course as references.The open course structure and navigation provides access points for both contexts and guidance as needed.

Special Considerations

The Humanities department offers both M.S. and Ph.D. degree programs. Within the M.S. programs, it is important to assume that students will have varying rationales for earning their degree. Some students may be in either of the M.S. programs to earn a degree and teach at a two year college, or as part of a larger career goal of continuing on to a Ph.D. program. Other students may be earning their M.S. degree in order to fulfill a career requirement, or as a means to achieve a better position within their organization or earn a higher rate of pay.

Students who are earning their degree for work related reasons may have little interest in sections within our course involving professional engagement and publishing. Conversely, students who are entering the program with a background in research may not be as interested in the style or research sections of the course. Making the course optional, modular, and allowing students the opportunity to easily bypass lessons that are less pertinent to their career or professional goals will ensure that lessons will be targeted at learners who will benefit the most from their content and activities. The ability of the individual to select which lessons he or she wishes to complete should account for differences in life stages among learners as well as differential ability levels.

In order to account for differences in race, age, and gender, all examples and scenario-based learning exercises will be descriptive and specific, but the topics will avoid sensitive issues that might be offensive or that could distract the learners from the goals of the course. All style sheets will be designed to accommodate learners with low vision and care will be taken in all lessons to meet web accessibility standards. Different learners have particular styles of learning that allow them to retain information and learn procedures faster in different situations. Since we cannot evaluate learners prior to their participation in this course, our lessons will have exercises that appeal to different types of learners when possible.