A Practitioner’s Guide to Research Methods

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SUMMARY

Practitioners can help the professional growth of technical communication by becoming more knowledgeable about the research methods that generate knowledge in the field. Methods for research on writing are typically quantitative—experimental with randomized subject selection, treatment, and control groups—or qualitative—case or ethnographic study with representative subjects in a naturalistic setting. Both methods are important. The greatest strength of quantitative research is its ability to describe cause-and-effect relationships. The greatest strength of qualitative research is its in-depth depiction of subjects in an actual setting. Because of the complexity involved in any type of research on writing, whatever method is used, the reader should analyze a study carefully before generalizing from it.

If you are a Macintosh user and your boss or supervisor did not send you a copy of a certain article that appeared in Academic Computing in January 1990 [1], you may be more rare than an endangered species. That article “proved” that writing produced on an IBM was better than writing produced on a Macintosh. The “findings” of this article appeared in a number of popular and academic publications, and they created quite a stir in the academic as well as the computer world [2-4].

The article has the aura of scientific research: It has what sounds like scientific research terminology and it refers to what appear to be experimental methods. Thus, its conclusions were taken as scientific proof by many readers. Such readers focused on the article’s conclusions, not on the method used to arrive at them. Whether readers skipped over the methodology or didn’t know what to make of it—just that it sounded scientific—the result was the same. People thought that they now had proof that writers produced better writing with one brand of computer than with another brand. But the research methodology of the article is flawed, and as a result, the conclusions are virtually meaningless.

Unfortunately, research methodology in the field of rhetoric and professional communication is a subject that isn’t widely understood. Technical writers in industry, even some who have a degree in technical communication, may not have been exposed to the concepts that let one know how much a given piece of research can be relied on. And these writers often are aware that a knowledge of research findings can be useful. They want to believe.

In fact, in the 1990 survey of the readers of Technical Communication, the second most common request by survey respondents was that the journal publish more research-based articles. Frank R. Smith, who analyzed the survey results, notes that “if we are to grow as a profession, we must begin to found our work in solid research instead of working on the basis of intuition, guess, habit, and prejudice” [5].

Similarly, Mary Sue MacNealy comments that the
development of a field proceeds in two stages: “In the first, a concern with training and with description of practices and projects predominates, indicating an interest in establishing common procedures and topics of importance. In the second stage, systematic research supplants or complements the earlier, more impressionistic work” [6].

Based on her analysis of systematic research presented in the proceedings of the International Professional Communication Conference (IPCC) and the International Technical Communication Conference (ITCC), MacNealy sees technical communication moving beyond the first stage of a discipline under development. She concludes that “Those technical communicators and their coworkers who are interested in the development of technical communication as a discipline must begin to find ways to foster the systematic research needed to complement the earlier, impressionistic work” [6].

The most common error made in reading research is overlooking the methodology and concentrating on the conclusions. Yet if the methodology isn’t sound, the conclusions and subsequent recommendations won’t be sound.

Further emphasis on the need for technical communicators to be knowledgeable about research methods comes from Wenger and Spyridakis, writing about usability testing. They say, “It is going to be increasingly more difficult for practitioners to rationalize a lack of concern for appropriate methods” [7].

Thus, while the importance of conducting and reporting research to the field is generally acknowledged, practitioners must also know how to evaluate this research. Interestingly, Earl McDowell found that practitioners rated courses in research methodology higher in importance than did academicians; however, such courses did not rank in the top 10 of important courses [8]. The need to understand research methodology is a concern of practitioners.

WHAT PRACTITIONERS SHOULD LEARN ABOUT RESEARCH METHODS

This article has two objectives: first, to identify the main types of methodology in business and technical communication research, and second, to help technical communication practitioners understand the distinguishing characteristics of these methodologies.

The purpose here is not to turn practitioners into researchers but to give them an overview of research methodologies so that they can be more informed readers and users of research. The most common error made in reading research is overlooking the methodology and concentrating on the conclusions. Yet if the methodology isn’t sound, the conclusions and subsequent recommendations won’t be sound.

Sometimes the methodology is not available for the reader to examine. The reports on business and technical writing research printed in trade magazines and the popular press usually focus so narrowly on the results that much of the discussion of methodology in the original reports is eliminated. Thus, practitioners may have to seek out the original study before they can make an informed judgment about applying particular research conclusions. However, even then they cannot be assured of finding an adequate discussion of methodology.

MacNealy notes that authors who fail to include basic information on methodology “in order to have more space for discussing findings” do themselves a disservice “because such an omission raises questions about the soundness of their conclusions” [6]. Whatever the case, practitioners should not blindly accept the findings of any piece of research without first examining its methodology in order to make their own judgments about whether the research’s conclusions can be generalized.

At this point the reader should understand that the following guide to research takes great liberty in simplifying a complex subject, stripping away many of its nuances. This is necessary to make the subject of research methodology accessible to the users of research, and the reader should not be misled by this reductionist approach to the subject.

TYPES OF RESEARCH ON WRITING

Naming the types of research methodologies that exist in research on writing depends, to a degree, on whom you read and with whose classification that you agree. There are two empirical methodologies—quantitative and qualitative—that come to writing research primarily by way of the social sciences and through educational research. Two other methodologies or approaches come primarily by way of the En-
glish department: scholarly inquiry and practitioner inquiry.

Quantitative and qualitative research are the types of academic research that the practitioner will often find in academic journals and at academically sponsored conferences. The two other methodologies, scholarly inquiry and practitioner inquiry, are included here to provide a more complete review of the kinds of methodologies used in research on writing. The names of these other two categories derive from, and came into popular usage from, *The Making of Knowledge in Composition* by Stephen North [9].

**Quantitative Research**

Quantitative research attempts to quantify key aspects, or variables, of a situation and relate them to one another. The researcher performs an experiment that manipulates these variables in some way. The manipulation is usually called a treatment. The results of the treatment are measured and statistically analyzed. The purpose of quantitative research is to establish cause-and-effect relationships.

**Qualitative Research**

Qualitative research is descriptive in nature. The researcher observes a specific situation. The researcher doesn’t tamper with this setting in any way. The purpose of qualitative research is identifying key variables in a given situation that may prove useful in framing questions to be explored further, by qualitative research or by other modes of inquiry.

**An Example of Quantitative and Qualitative Research**

What if you were interested in online manuals and wanted to design a study? What might you do?

If you were designing a quantitative study, you might want to see whether a relationship existed between how much experience users had with online documentation (one variable) and how quickly they were able to use your online manual to solve a particular problem (another variable). The results might prove that your online manual was so easy to use that a novice could work with it as quickly as an experienced user.

If you were designing a qualitative study, you might go into a setting where online manuals were in use and observe the people using them. You wouldn’t try to prove that there was a relationship between how much experience with online documentation the users had had and how quickly they were able to use an online manual to solve a particular problem; rather you would be interested in how online manuals were used, who used them, how often they were used, whether or not people liked using them, and so on.

**Scholarly Inquiry**

Scholarly inquiry is in a sense a text-based approach to research. According to North, the purpose of scholarly inquiry is dialectic, “the seeking of knowledge via the deliberate confrontation of opposing points of view” [9, 60]. If one thinks of the traditional approaches to studying literature and then applies these approaches to other kinds of writing, one has the essence of the scholarly approach.

In research on writing, these “other kinds of writing” may include the freshman essay, the engineering lab report, the software manual, or copy for a print advertisement. In scholarly inquiry one may study the writing from a historical, a critical, or even a philosophical point of view. For the first two types of study, the researcher gathers and analyzes documents according to some scheme or theory. Philosophical inquiry, as the name implies, ponders fundamental assumptions and beliefs about writing and communication.

**Practitioner Inquiry**

Practitioner inquiry is basically a report, or story, of how an individual handled a particular writing problem or situation. That situation may be how to teach students to write a comparison/contrast essay, or how to produce a hypertext documentation for a software package. It is “experienced-based testimony” [9, 36]. As North says, “It is concerned with what has worked, is working or might work in teaching, doing, or learning writing” [9, 23]. Its purpose is to provide an account of what to do in a particular situation.

**Evaluating the Types of Research on Writing**

One type of research is not necessarily better than another. Each method does different things. However, in the past couple of years, the methodology of most of the articles in the proceedings of the IPCC and of the ITCC has ranged from “anecdotal evidence to quasi-empirical evidence,” according to
MacNealy [6]. Moreover, she notes that “few carefully regulated, empirically-based research articles have appeared in the proceedings. Most articles are descriptive or are training presentations (what North would probably call practitioner inquiry).

According to Bereiter and Scardamalia, there are various levels of inquiry in research on composition. The types of methodologies used in writing research are not hierarchical but are part of a recursive cycle. Key variables of a situation identified in qualitative studies are often then tested in quantitative studies. The results of the latter usually suggest other questions, and so a new cycle begins “but with a heightened understanding acquired from the preceding cycle” [10]. Thus, both types of research are important and useful.

The Problem of Generalization of Research Results

A common problem, though, in interpreting the results of any type of research is overgeneralization. Every qualitative study and every quantitative study has limitations due to the circumstances in which the data were collected. These constraints put limits on how much one can generalize a study’s results. The problem is that most people look at the results and don’t note the constraints that should temper the generalizations.

Writing research is notoriously hard to generalize from because the qualitative studies are so situation-specific and because the quantitative studies, with their experimental apparatus, are so unnatural for the behavior they are studying. Hence, all results in writing research are surrounded by a gray area. Engineers, for example, can cope with this gray area by reporting results as falling in a range, “X ± 3.” Researchers in rhetoric and professional communication usually attempt to do this by qualifying the generalizations. But the problem remains: readers of the research skip the qualifiers and gravitate to the generalizations.

Characteristics of Quantitative Research

Quantitative research in writing is of two types: experimental and quasi-experimental:

- Experimental research is characterized by (1) random sampling, or selection, of subjects; (2) introduction of a treatment; and (3) use of a control group for comparing subjects who don’t receive the treatment with those who do.
- A quasi-experimental methodology is different because the subjects are not randomized; that is, a researcher using a quasi-experimental method will use intact groups of subjects, for example, students in one classroom, or workers in one department in an organization.

Random Selection of Subjects

One of the greatest strengths of quantitative research is that the subjects are randomized; that is, the subjects are drawn by chance from the general population of interest and have nothing in common with each other except what would be expected by chance. Random samples are representative of the populations from which they are drawn because every member of a population has an equal chance of being included.

This is an important characteristic because it means the results can be generalized. Randomization means that any differences a researcher finds between the group that received the “experimental” treatment and the control group that didn’t are the result of the treatment and not the result of chance.

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Random samples may also be stratified. That is, when the composition of a population is known and a population with specific characteristics is desired for study, the random sample can be selected from this subgroup of the population. For example, the population of a study might be engineers and an aspect of the study might involve gender differences. If the researcher knows the ratio of women to men in the population, the sample can be drawn so that proportionate numbers of women and men are selected.

Because the groups are not randomized in quasi-experiments, the researcher seeking to draw on the power of the experimental method must do something to establish that the groups are comparable. This something is called a pretest. It may be simply
background information on subjects such as “years of computer use experience,” or it may be more “test-like,” as in a questionnaire to determine subjects’ previous knowledge about a topic related to the study.

Hypotheses in Quantitative Research

Quantitative research, being experimental, is hypothesis-driven. That is, the researcher has a hypothesis about what should happen as a result of a treatment. A treatment is some condition applied to the experimental group, for example, receiving a certain type of instruction or using a particular type of online documentation. The researcher has an experimental group that receives a treatment and a control group that does not. The null hypothesis states that after the treatment there will be no difference between the control and experimental groups. If there is a difference between the groups after the treatment, it is assumed that it can be attributed to the treatment. The researcher can then make a cause-and-effect statement.

The reason for all the statistical apparatus in quantitative research is to explain that relationships between variables are due not to chance but to cause-and-effect relationships. Statistical methods “enable us to study and to describe precisely averages, differences, and relationships” [12, 243].

Some of the more common questions that researchers ask and use statistics to answer are:

- Is there a significant difference between these two (or more) groups on this variable?
- What confidence can I have that observed differences did not occur by chance?
- Is there an association between these two (or more) variables? If so, how close is the association [12, 243]?

Spyridakis, Wenger, and Andrew have written a helpful guide to statistics commonly used in research about writing [13]. As they note, there are two kinds of statistics, descriptive and inferential:

- Descriptive statistics allow a researcher to describe data in an orderly fashion. The most common descriptive statistics are frequency distributions: Mean, median, and mode— the average score in a data set, the score in the exact middle of a data set, and the most frequent score in a data set.
- Inferential statistics allow a researcher to infer that relationships exist among variables. The most common descriptive statistics are chi-square, a t-test, and an F-test.

These statistics indicate whether a data set is distributed according to theoretical expectations and whether there are significant differences between groups on the variables being studied.

Because in current statistical thinking an effect is considered to be the result of a number of interacting causes, especially in explaining human behavior, multivariate analysis—considering two or more treatment variables and their interaction with the independent variable—is very important in statistics. Causes, according to Miller, manifest themselves in four ways:

1. Causes may occur in a sequence to produce an effect.
2. Several causes may converge or cluster to produce an effect.
3. The effects of a single cause may disperse outward into many different areas.
4. The preceding three manifestations of cause may all occur to create a complex network of causes for an effect [12, 258-259].

In quantitative research, the researcher must identify independent and dependent variables carefully:

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• An independent variable is the cause of something in a relationship; it is the treatment in an experiment, the activity that will make a difference in the outcome of an experiment if indeed there is a cause-and-effect relationship among variables.
• A dependent variable is the effect. The effect is the change or difference that occurs as a result of the manipulation of the independent variable.

So if you were studying whether there was a relationship between how much experience users had with online documentation and how quickly they were able to use your online manual to solve a particular problem, the independent variable would be the amount of experience users had with using online documentation, and the dependent variable would be how much time it took them to use the online manual to solve a problem.

You might also decide to administer a treatment—give the users a short tutorial on your online manual—then measure how much time it took them to solve the problem. In that case you would be manipulating the independent variable by changing the amount of experience that the subjects of your study had with online documentation.

Given the myriad ways that causes may manifest themselves, one begins to understand the difficulties that the researcher faces in creating an experimental design that might uncover a relationship between or among variables that is truly statistically significant. So while statistics would seem to make the results of a study more generalizable, the complexity involved in creating an experimental design should make one cautious in accepting the results of an experimental study. Moreover, while statistics are useful for showing trends and indicating probabilities, they don’t necessarily tell us what is going to happen in a particular case.

Validity and Reliability in Quantitative Research

No discussion of quantitative methodology is complete without noting the concepts of validity and reliability.
• Validity refers to whether the experiment actually measures what it says it will measure. An experimental study must have internal and external validity. Internal validity means that the difference in the dependent variable is actually a result of the independent variable. External validity means that the results of the study are generalizable to other groups and environments outside the experimental setting.
• Reliability refers to whether the experiment precisely measures a single dimension of human ability [11, 286].

In reporting the results of their research, researchers should discuss whether there were any threats to validity or reliability.

Problems with Quantitative Research

Quantitative research focuses on isolated variables in a structured situation. These characteristics enable the researcher to draw fairly explicit and definitive conclusions, but they also pose problems [11]. Many argue that the settings of experimental research do not mirror the conditions under which people actually write, consult a manual, or use online documentation.

While the conclusions of quantitative research seem to be definitive, they are based on unnatural conditions. It is not always possible to conduct a “true” experiment as opposed to a quasi-experiment in research on writing.

Another problem is that the need to isolate and to control variables may eliminate other variables that would affect the research results. Thus, while the conclusions of quantitative research seem to be definitive, they are based on unnatural conditions. Moreover, it is not always possible to conduct a “true” experiment as opposed to a quasi-experiment in research on writing. In a sample drawn from a general population, important variables such as sex, socioeconomic status, ethnic background, or previous experiences cannot be randomly assigned [11].

Characteristics of Qualitative Research

Qualitative research in rhetoric and professional communication is of two types: case study and ethnographic study.
• Case study, as its name implies, is research about a particular individual or a small group of individuals.
• Ethnographic study, on the other hand, is research about the whole environment in which an individual or a group of individuals function as communicators.
In practice it is often difficult to identify a piece of research as a case study or as an ethnographic study. In research about writing, the line between the two can become fuzzy. Also, the line between case study and practitioner inquiry can sometimes seem fuzzy. However, the practitioner inquiry will not be as concerned with analysis of the "case," that is, the why and what it means. Instead, the practitioner inquiry will be more concerned with presenting the details of the case.

Subjects

In a qualitative study, subjects are not randomly selected from a population. A researcher may try to pick subjects who are representative of a group, but there is no statistical assurance that they are, and often a researcher will have to select subjects based on their availability rather than subjects who fit a certain profile. However, purposeful sampling can enhance the weight of the results of a qualitative study.

Purposeful sampling attempts to select "information-rich" cases for study [14, 169]. There are 15 strategies for selecting a purposeful sample. The importance of this technique is that it allows the researcher to create a reasonable rationale for studying a particular group of subjects. So, while qualitative researchers cannot make cause-and-effect statements, the researchers with a purposeful sample can make an argument for the validity of their in-depth qualitative findings.

Some representative strategies that are applicable to research on writing include extreme case sampling, intensity sampling, and maximum variation sampling:

- Extreme case sampling focuses are subjects who are unusual or special in some way. The logic is that "lessons may be learned about unusual conditions or extreme outcomes" that are relevant to typical cases [14, 170]. In research on writing, for example, this strategy could manifest itself in studies that compare novice writers and experienced writers.

- Intensity sampling looks for cases "that manifest the phenomenon of interest intensely (but not extremely)" because "extreme or deviant cases may be so unusual as to distort the manifestation of the phenomenon of interest" [14, 171]. If a researcher is concerned with "skillful" users of on-line documentation, for example, it would not make sense to study all or just any users of online documentation. Rather, the researcher should focus attention on users who have skill with online documentation but who are not the very "best" ones.

- Maximum variation sampling focuses on what common patterns emerge from a diverse group. The common patterns that emerge from great variation capture "core experiences" [14, 172]. Thus, in studying experienced and novice users of online documentation, the researcher would seek out their common experiences to help describe what happens when someone uses online documentation.

Data Collection and Analysis

No treatment is involved in qualitative research, since it is exploratory and attempts only to describe what goes on in a communication situation. The setting is naturalistic; the subjects are observed as they are and no change, or "treatment," is attempted. For example, the researcher would observe how technical writers actually collaborate in doing their jobs rather than putting a group of them through a training program on collaboration and then measuring the effect of such training on them as compared with a control group that had not had the training. The qualitative researcher does not attempt to isolate variables to determine how they interact, as in experimental research. The purpose of qualitative research is to identify salient features or variables in the situation. Administering a treatment would interfere with that goal.

Because there is no randomization of subjects, no identification of variables, and no treatment, it is important that the qualitative researcher provide readers with a full description of the setting where the data were collected and how they were collected. For example, not only should the researcher discuss subject selection as indicated above, but also site selection, the researcher's role, data-collection techniques (observation, interviews, surveys, videos, etc.), management and recording of data (field notes, transcripts of audio tapes, etc.), and data-analysis strategies [15, 50].

In qualitative research, the relationship of the researcher to the data differs from that in quantitative research. The researcher is usually a participant-observer in the setting rather than someone who is measuring the relationship between predefined variables. Thus it is also important for researchers to indicate their role in the setting: How much and what kind of participation in the setting occurred? Did it
influence the interpretation of the results of the observation?

Triangulation is an important concept in qualitative research. It helps to reduce systematic bias in the data [14, 470] and it contributes to the verification and validation of the qualitative analysis [14, 464]. Triangulation is basically comparison. There are four types of triangulation:

1. Data triangulation
2. Methods triangulation
3. Researcher triangulation
4. Theory triangulation.

Data triangulation involves comparing and cross-checking the consistency of information gathered at different times with the same method, for example, interviews at the beginning, middle, and end of a study.

The strength of qualitative research is that it depicts business and technical writing situations as they truly are. Its weakness is that these findings cannot be generalized because the sample on which they are based has not been randomized.

Methods triangulation involves checking the consistency of information gathered by different means—field notes by the researcher, interviews with people in the setting, documents written and used by people in the setting, and so on.

Researcher triangulation is achieved by having more than one researcher interpret the data. Agreement among several researchers about what went on in a situation enhances the validity of the interpretations.

Theory triangulation involves looking at the same data from different perspectives.

Judging a Qualitative Study

Because of the numerous factors involved, Marshall and Rossman recommend that reports of qualitative studies be judged on the following ten criteria [15, 148]:

1. Data collection methods are explicit.
2. Data are used to document analytic constructs.
3. Negative instances of the findings are displayed and accounted for.
4. Biases are discussed, including personal and professional biases, and theoretical biases and assumptions.
5. Strategies for data collection and analysis are made public.
6. Field decisions altering strategies or substantive focus are documented.
7. Competing hypotheses are presented and discussed.
8. Data are preserved.
9. Participants’ truthfulness is assessed.
10. Theoretical significance and generalizability are made explicit.

If a study discusses all of the above topics, the reader can have greater confidence in the researcher’s thoroughness and in the credibility of the conclusions reached in the study.

An Advantage and Disadvantage of Qualitative Research

The strength of qualitative research is that it depicts business and technical writing situations as they truly are. Its weakness is that these findings cannot be generalized because the sample on which they are based has not been randomized.

As Lauer and Asher have noted, co-occurrences are often misinterpreted as cause-and-effect relationships in qualitative research [11]. Factors that appear to have a cause-and-effect relationship may be due only to chance, and we have no way of knowing whether they are or are not.

Although the conclusions of qualitative research are not so generalizable as conclusions from quantitative research, generalizations may be made if they are limited to the subjects and the settings studied.

Other Research Methods

Very often researchers in writing research mix methodologies, creating a sort of hybrid for the readers to evaluate. Thus one might have a study that provides an ethnographic account of a writing setting (qualitative methodology) and also includes the results of a survey (quantitative methodology) of the writers in that setting. The survey would be analyzed in a statistical manner, and these results might play a role in interpretation of the setting.

In judging the study, the reader would have to realize that the quantitative results in this hybrid situation differ somewhat from the quantitative results in a purely quantitative study. The survey might
help the researcher quantify some of the impressionistic and anecdotal data gathered in the qualitative part of the study.

**DEVELOPING METHODOLOGICAL LITERACY**

In discussing various research methodologies, one is tempted to identify the “best” one and to dismiss the others as having too many shortcomings. But research on writing is not really an either/or situation. Each method, when carefully implemented, can provide us with insights about how people produce and process texts. It is also important to remember the complexity of what we are studying—human behavior that occurs in a social context—and thereby also resist the temptation to overgeneralize the results of any one study, regardless of the methodology.

Both quantitative and qualitative research have “truth value”—quantitative research with its applicability, consistency, and neutrality, and qualitative research with its credibility, transferability, dependability, and confirmability [15, 145]. While quantitative methods may seem “better” because of their origins in science and thus their ability to predict and to describe cause-and-effect relationships, both methods generate information that helps us get at the truth.

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**Among the various skills that professional technical communicators are trying to attain, a knowledge of research methodology should be a primary one. With such knowledge, practitioners will be able to assess the value and meaning of research confidently.**

The way that qualitative methods get at the truth, though, may not be as familiar to readers as the way of quantitative methods. Qualitative methods can be judged by four constructs to assess their truth value:

- First, *credibility* is created when the researcher demonstrates that the study was conducted in such a way as to ensure that the subject was accurately identified and described [15, 145]. The parameters of a study must also be adequately stated.
- Second, the *transferability* of the conclusions of the study may be demonstrated. Transferability, or generalizability, is the most problematic aspect of qualitative research, and it is more of a problem to a researcher who wants to use the findings of a qualitative study than to the original researcher. The original researcher’s use of a theoretical framework that guided data collection and analysis as well as triangulation of data can enhance a study’s transferability to other settings.
- Third, *dependability* is created when the researcher “attempts to account for changing conditions in the phenomenon chosen for study” [15, 146]. Quantitative research rests on positivist notions of an unchanging reality, a direct contrast to qualitative assumptions that the social world is always changing. So rather than replicability, the qualitative researcher seeks to be able to explain the changes that occur.
- Finally, *confirmability* demonstrates that the findings of the study could be confirmed by another, that is, the findings of the study are “objective.” To obtain objectivity, the qualitative researcher must pay scrupulous attention to documenting methodology, use more than one researcher to record and interpret data, and maintain the collected data on a study in retrievable form so that another researcher can reanalyze the data to confirm the conclusions.

Among the various skills that professional technical communicators are trying to attain, a knowledge of research methodology should be a primary one. With such knowledge, practitioners will be able to assess the value and meaning of research confidently for their own work experiences and needs as professional communicators.

Some fundamental questions that such a reader of research should consider when examining a study are given in Figure 1. This checklist of questions gives practitioners a simple and systematic way to ask some of the appropriate questions about a study. With their understanding of the basics of the methods that produce knowledge in their field, these practitioners will contribute to the increasing professionalization of technical communication.

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**REFERENCES**


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GUIDE FOR ANALYZING RESEARCH METHODOLOGY

1. The Problem
What question is the researcher trying to answer?

2. The Data
What kinds of data need to be collected to answer the question?
What kind of data did the researcher collect? Was it the type that will be needed to answer the question?
Was more than one kind of data collected so that results can be triangulated if need be?

3. The Subjects
Who were the subjects for the research? How many subjects were there? What are their demographic characteristics? What background do they have that makes them appropriate subjects for this research? How were these subjects recruited to participate in this research? Were they volunteers? Were they paid?

4. The Methods
What were the subjects asked to do that produced the data that will provide an answer for the research question? Did the task seem appropriately related to the research question being asked?

5. The Analysis
How were the data analyzed? Were appropriate statistical techniques used? If data were to be interpreted by raters, how many raters were there? How were they trained? What criteria did they use in interpreting the data?

6. The Conclusions
How much does the researcher generalize in the conclusions? Did the researcher generalize beyond the bounds that are appropriate for the research method used?
- Quantitative research can establish cause-and-effect relationships.
- Qualitative research can generalize only about the particular subjects that were studied and can make an argument that they are representative of others with similar characteristics.

Figure 1. Guide for Analyzing Research Methodology