2

Identifying a Research Problem and Question, and Searching Relevant Literature

Chapter Objectives

In this chapter, the reader will

- understand the characteristics of a research problem or phenomenon.
- understand the characteristics of good research questions.
- clarify the difference between a research problem and hypothesis.
- understand the purposes of a literature review.
- understand the process for conducting a literature search.

Long before you create a research proposal, let alone conduct your research, you need to identify a problem or phenomenon to address and then a question or questions to ask about the problem or phenomenon. This chapter first discusses the nature of a research problem, where you might get ideas for a problem to investigate, narrowing down or focusing on a particular problem to address, and writing good research questions. It then discusses finding literature that is relevant to and helpful in clarifying your targeted problem and question(s).

Identifying a Research Problem

We often think we understand problems when we really don't. For example, when students encounter difficulties with word problems in math, teachers may initially think that students have not mastered the basic skills that would allow them to carry out the needed computations. However, the difficulty may actually lie in poor reading skills, which prevent the students from identifying the words in math problems. The student also might not understand or correctly interpret essential vocabulary.

As another example, when students do not hand in homework assignments or participate in class, some might be inclined to think that the students are not motivated. While there may be motivational issues, motivation may not be the only factor. A high school student may have an evening job that demands considerable time and energy. A younger student may be trying desperately to camouflage poor or nonexistent skills. In some cases, the chosen instructional strategy may not be well matched to the student's cognitive or attention level. Therefore, it is crucial that researchers accurately identify the problem they want to study.

What Is a Research Problem?

A research problem, or **phenomenon** as it might be called in many forms of qualitative methodology, is the topic you would like to address, investigate, or study, whether descriptively or experimentally. It is the focus or reason for engaging in your research. It is typically a topic, phenomenon, or challenge that you are interested in and with which you are at least somewhat familiar.

Where Do You Find a Problem or Phenomenon to Study?

Since a research problem is usually something about which you have some knowledge, that personal experience is often a good starting point. Realistically, you have to select something that you are interested in, because you are going to commit yourself to a significant investment of time and energy. Thus, if you are not personally interested, it will be difficult to sustain the effort needed to complete the research with any measure of quality or validity. You may want to talk to teachers, counselors, administrators, psychologists, or others about some of the problems they face. For example, your ideas may come out of experiences like Johnny's shout outs, Madeleine's reading rate, or Esmerelda's trouble with math that were discussed in Chapter 1. You may find an interesting idea that way and, in addition, address something that may have social significance beyond your research project, thesis, or dissertation. Moreover, by addressing the questions of practicing educators, you may develop important relationships with future research partners and participants.

Narrowing or Clarifying Your Problem

A problem statement such as "Students can't read" is not clear because many aspects of reading, including discrete reading skills and strategies, may contribute to reading

difficulties. Alternatively, "Students cannot find the main ideas in reading passages," is much clearer and potentially much easier to measure and address, since one can define *main idea* and measure student performance on tasks that require students to find main ideas.

So, whether in the classroom, the physician's office, or the mechanic's shop, defining or diagnosing a problem is key to designing and implementing effective interventions or treatments to address it. Without adequately defining the problem, researchers may find themselves going off on a "goose chase" to tackle a vague phenomenon, trying to deal with symptoms rather than root causes, and wasting time, becoming frustrated, or even making the actual problem worse.

Later in this chapter, you will read about the use of standardized test scores for entrance to undergraduate or graduate school as an example research topic. While that may be a good topic, it is not well defined; it needs to be narrowed by thinking about the kind of information that the researcher wants to find out. Whether you are interested in the kinds of tests that are used, the average cutoff scores, or the degree to which scores predict college grade point average, as examples, a topic has to be specific enough to be clearly defined and yield helpful results from a literature search that will follow.

Identifying a Possible Research Question

After you have narrowed down your problem, searching and reviewing existing literature may further clarify your research approach. Moreover, by identifying where the conclusions of previous research are unclear or where gaps may exist in the literature, you will be better prepared to write good research questions.

What Is a Research Question?

A research question is a way of expressing your interest in a problem or phenomenon. Research questions are not necessarily an attempt to answer the many philosophical questions that often arise in schools, and they are certainly not intended to be an avenue for grinding personal axes regarding classroom or school issues. You may have more than one research question for a study, depending on the complexity and breadth of your proposed work. Each question should be clear and specific, refer to the problem or phenomenon, reflect an intervention in experimental work, and note the target population or participants (see Figure 2.1). Identifying a research question will provide greater focus to your research or clarify the direction of your investigation, whether the research is descriptive or experimental. Quite significantly, a well-written research question will also shed light on appropriate research methods (e.g., specify the intended actions of the variables and how an experimental intervention might be measured).

Examples of Good Research Questions

Given the characteristics of good research questions noted in Figure 2.1, let's take a look at some examples, and nonexamples, of good research questions. Table 2.1

FIGURE 2.1 ● Characteristics of Good Research Questions

- Are specific.
- Are clear.
- Refer to the problem or phenomenon.
- Reflect the intervention in experimental research.
- Note the target group of participants.

illustrates a few of each and includes explanations of why a researcher would categorize them as one or the other.

Here are some additional examples of good experimental research questions from existing literature:

- What are the effects of the flipped classroom on secondary chemistry students' performance on important constructs (Olakanmi, 2017)?
- Does participation in the professional development program increase ESL and classroom teachers' use of high-impact instructional strategies as compared to teachers in the control group (Babinski, Amendum, Knotek, Sanchez, & Malone, 2017)?
- Would a combined repeated reading and question generation intervention improve the reading achievement of fourth- through eighth-grade students with learning disabilities or who are at risk for reading failure (Therrien, Wickstrom, & Jones, 2006)?

The following are additional examples of good questions from descriptive research:

- What are the empirical factors that predict effective continuing professional development activities for school staff (Cheng, 2017)?
- How are the alternate assessments and achievement standards implemented for students with the most significant cognitive disabilities across 16 states (Kohl, McLaughlin, & Nagle, 2006)?
- How do elementary teachers anticipate and actually use iPads in the classroom over the course of the first year of 1:1 implementation (Frazier & Trekles, 2017)?

Writing a Hypothesis

A **research hypothesis** essentially is a declarative statement of how you expect the research to turn out. In a way, it is a possible answer to your research question.

TABLE 2.1 ● Examples and Nonexamples of Good Research Questions

Examples	Nonexamples
Do students in Algebra I classes who engage in the XYZ curriculum perform significantly differently on state tests than students who do not participate in that curriculum? This one is good. It is specific and clear. We know who the participants will be and that student performance on state tests is the problem.	*Why do students seem so apathetic?* This is not specific or clear, nor does it reflect an intervention, if one is planned, or a target group of participants. Better questions might be: Are science students more engaged in class discussions when a response strategy is used (experimental)? What are the reasons for apathy among various groups of high school students (descriptive)?
Do general education teachers evaluate student homework differently than special education teachers, based on five criteria? Assuming this is descriptive research, the problem is evident, the target participants are noted, and the question is pretty clear.	*Does computer practice improve state test scores?* Even though an intervention is mentioned and a way of measuring performance is implied (i.e., state test scores), the problem and target group are unclear.
Does the use of metacognitive strategies predict reading performance on standardized tests for immigrant Chinese children? This one is clear and quite specific, notes the target participants, and nicely alludes to the variables that will be studied.	*What strategies improve student understanding of main ideas in history texts?* The problem is pretty clear, but the target group is not. In addition, there is no specific reference to an intervention, important if this will be experimental research. If this will be descriptive research, on the other hand, that is moot.

It should be brief, note your important variables, and suggest something you can test or descriptively investigate. It is typically included in experimental research but is also found in descriptive research such as factor analyses or survey-based investigations. It is *not* typically included in qualitative methodology in which the results are intended to be emergent (refer to Chapter 6). In the case of experimental research and quantitative types of descriptive research, your research question often directly leads to your hypothesis. Therefore, it is good practice to ensure that your research topic or problem statement, research question, and hypothesis use consistent language regarding variables and any anticipated outcomes. Certainly, you would write a hypothesis for each question that you propose.

Let's go back to a couple of the good example research questions noted in Table 2.1 and see how a hypothesis might be written for each.

Question: Do students in Algebra I classes who engage in the XYZ curriculum perform significantly differently on state tests than students who do not participate in that curriculum?

Possible hypothesis: Students who participate in the XYZ curriculum in Algebra I classes will perform significantly differently on state achievement tests than students who do not participate in that curriculum.

If you wanted a directional hypothesis, one also could have written that the target students will perform significantly *better* on the tests. A **directional hypothesis** is one that implies a difference in a particular direction when one compares two groups or a group at different points in time (i.e., if one wants to project a difference in favor of one group or condition).

Question: Do general education teachers evaluate student homework differently than special education teachers, based on five criteria?

Possible hypothesis: General education and special education teachers evaluate student homework significantly different on each of five given criteria.

You may have previously heard the term null hypothesis. A **null hypothesis** is simply a statement saying that you expect no differences in outcomes between groups or that no relationships exist between the given variables in your hypothesis. Some researchers do not think that a null hypothesis adds substantial value to research, while others do. Your advisor may want you to include it in your proposal. The null hypothesis for the example above regarding the way teachers evaluate homework might be simply this: General education and special education teachers do not significantly differ on any of five given criteria for student homework evaluation.

Before leaving this discussion of research questions, let's focus for a moment on the concept of significance. You may have noticed the adjective *significantly* in front of the word *different* in each of the previous example hypotheses and null hypotheses. **Significance** refers to the notion that differences between two groups or conditions are not simply due to chance or any other known variable (Gall, Gall, & Borg, 2006). The term is also typically used in reference to statistical differences that may be noted in the analysis. Significance will be further discussed in Chapter 9.

IN THEIR OWN WORDS

Defining and Writing Research Questions

Tamara Nimkoff, doctoral student

What makes a good research question? It's a common query that graduate students face when developing their research topics. Unless a topic, and its subsequent questions, are handed to the student, there is often a period of uncertainty in which the student is developing a host of possible research questions all the while wondering if they are actually thesis or dissertation "worthy." Students often feel they need to demonstrate their sophistication by creating complex and multilayered questions. Certainly, it's important to consider the originality of a research topic, the contribution it will make to the field. But you can approach an interesting and important topic with research questions that are uncomplicated and clear. Start with the idea—what you want to know about the topic—and then break that idea down into more and more parsimonious questions. Don't be afraid of simplicity in composing research questions. A set of straightforward research questions will help you stay focused on your research topic at those inevitable times when you need to regain your footing and will demonstrate to your committee and your readers that you have a focused research agenda.

The Purposes of a Literature Review

Depending on whether you are a teacher, graduate student, administrator, or have another role, you may have one or more purposes for conducting a literature review. There are actually many potential purposes, but let's focus on a few common ones: (a) to help figure out what works; (b) to pursue a topic, problem, or question of professional and/or personal interest; (c) to pinpoint an area of further study; (d) to provide a rationale/background for study; (e) to survey or analyze research methodology. You may have one or more, or even all, of these purposes for conducting a literature review.

To Help Figure Out What Works

The introduction to this chapter alluded to the need for educators continuously to search out best practices for students, particularly struggling students. Indeed, this is an important task. Teachers, administrators, and other educators look for ideas in workshops, on the Internet, from conference exhibits, or simply in the classroom across the hall. These may provide ideas, but one may not know whether research has established their trustworthiness. By searching the literature, instead of or in addition to these efforts, educators may find valuable information about practices that have been tested with students and in situations similar to those that pose challenges for them. In that way, they may find specific information about what works and what does not.

To Pursue a Topic, Problem, or Question of Professional and/or Personal Interest

Whether you are an educator, a graduate student, or both, you may want to investigate or may be assigned to investigate a topic through a literature review. Perhaps you have a research problem in mind and have even written a tentative research question or two. Whether your problem or topic is graphic organizers, multiple intelligences, class size, or any other, a literature review may be a rewarding opportunity to ask and begin to find answers to your questions. Perhaps you tried cooperative learning as a teacher but decided it didn't work for you. You may be surprised or validated by what the literature says on the topic. Regardless of the topic, a literature review is an excellent chance to learn more about an area of interest.

To Pinpoint an Area of Further Study

Compiling and analyzing previous research will always reveal something to you. If you are interested in a particular topic, a literature review may reveal simply that little or no research exists on that topic. Let's say you wanted to study the effects of learning strategies on state competency test scores. You are likely to find very little on that subject, but if you look at research generally on the outcomes of learning strategies, you will find quite a bit. You might further discover that while there is a lot on learning strategies, there is little specifically on test taking strategies. So, you see, by searching and analyzing the literature, you may pinpoint a particular area where research is needed.

To Provide a Rationale/Background for Study

If you are a graduate student and are required to write a thesis or dissertation or engage in a research project, you will need to include a literature review as part of your final product. Thus, a literature review not only provides you with an opportunity to learn more about a given topic but also to create support or a rationale for engaging in a particular area of proposed research. For instance, if you wanted to research the use of math manipulatives, conducting a literature review would give you a chance to show others the importance of your topic and refine the problem, research questions, or hypotheses you have targeted as well.

To Survey or Analyze Research Methodology

When you select a topic to study, pinpoint a particular area of needed research related to your topic, and provide sufficient background to support further research, you may also use a literature review to look at how previous researchers studied the topic. You may clarify ideas, see flaws, or discern opportunities. For example, perhaps a topic such as token systems has been studied in certain settings through single-subject experimental designs. You may look at that literature and decide that your research questions might be best answered through a large-group experiment. Alternatively, you might decide that you would like to qualitatively describe the impact of token systems on student motivation. In short, by analyzing research methodology in a literature review, you may discover how you should design your own research study.

The Process of Conducting a Literature Search

Whether you have one or more purposes for conducting a literature review, there is a process for getting from point A to B. That is, there is a process that can take you from knowing little or nothing to understanding something meaningful and informative. This process may be referred to as conducting a **literature search**. This includes (a) determining your focus and (b) searching literature databases. Let's take a look at that here. The next chapter will help you then analyze the studies you find, as well as organize and write a literature review.

Determining Your Focus

Determining your focus for a literature search includes three important activities: picking a topic, making decisions about what to include and exclude, and translating the topic into key terms.

Step 1: Picking a Topic. Let's say you're interested in the use of standardized test scores for entrance to undergraduate or graduate school. That's a good topic, although not well defined. You may need to narrow it by thinking through what kind of information you'd like to find out. For instance, do you want to find out what kinds of tests are used? Do you want to learn about the average cutoff scores? Are you interested in how well the scores predict college grade point average or employment status after college? How about the way that admissions departments weight the scores in their decisions?

One way or the other, a topic has to be specific enough to yield useful results when you get to the actual literature search.

While you may start off with too broad a topic, you could begin too narrowly also. Perhaps you are interested in the use of metacognition among immigrant Chinese children in elementary reading. My hunch is that you might need to broaden the search to look for information about metacognition in immigrant children's reading. Looking for previous research related to Chinese children in elementary reading would likely yield little or nothing. It is, however, worth beginning your search with a narrower focus to see what you can find.

Step 2: Making Decisions About What to Include and Exclude. After thinking through your topic so that it is not too broad and not too narrow, you can make decisions about what to look for in your search. Your topic scope will also help you decide what to disregard should an initial computer search yield hundreds of possible articles. Moreover, it will help you in the next step of the process, searching more efficiently with key terms.

Inclusion and exclusion decisions may be based on many things, including the age of the students you want to study, the years of teacher experience, the location of the study (rural, urban, suburban), the date on which the study was conducted, whether the students have disabilities or not, and many, many other possibilities. For instance, in the previous example, you might want to start by including articles that address metacognition in immigrant children in any location, and you might exclude articles that address American-born children and those written before 2005 because you want to look at more recent experiences in research.

Step 3: Translating the Topic Into Key Terms. By deciding what to include and what to exclude, you prepare yourself to search more effectively and efficiently. When you begin to use online search indexes such as the Educational Resources Information Center (discussed in the next subsection), the index will prompt you to enter search terms. The index will then find articles and documents that use those terms in their descriptions.

So, to take our example further, the key search terms in the topic of "metacognition among immigrant Chinese children in elementary reading" would likely be *metacognition, immigrants, Chinese, elementary*, and *reading*. As mentioned earlier, this is a pretty narrow topic and thus has five search terms; you certainly may have fewer than five when beginning your literature review. The more terms that you decide to search, the less likely you will find a lot of literature on the topic. Still, it may be more efficient to start your search as narrowly as possible and then broaden your effort. Let's look at that next.

Searching Literature Databases

Generally speaking, you can search literature electronically or by hand. Certainly, using an online database is far more efficient than searching stacks of journals or other resources in the library. Nevertheless, even if you begin your search online, you may find yourself searching the reference lists of selected articles to find additional sources. For now, let's first walk through how you might conduct an electronic search.

Searching Online. There are many possible databases where you can conduct an online literature search, including those noted in the Technology in Research features box, as well as other generic databases such as Google (google.com). The following paragraphs

TECHNOLOGY IN RESEARCH

In addition to ERIC, there are many other electronic databases for literature searches, including PsycINFO (apa.org/pubs/databases/psycinfo/); PubMed, a service of the National Library of Medicine, which includes citations from MEDLINE (https://www.ncbi.nlm.nih.gov/pubmed); Google Scholar (https://scholar.google.com); Education Research Complete (https://www.ebsco.com/products/research-databases/education-research-complete); and JSTOR, a digital archive of academic journals and other scholarly content (jstor.org).

highlight examples using the Educational Resources Information Center (ERIC; eric.ed.gov), a database that the U.S. Department of Education has supported for many years and perhaps the most widely used database in education. ERIC is free, meaning no university login or password is required. ERIC contains over 1.6 million records, including many full text materials. Records include journal articles, reports, fact sheets, conference papers, books, and other materials dating back to 1966 and are updated monthly.

ERIC uses simple features that often eliminate the need for complex searches. A simple search will return records based on your search terms or their variants by author, title, source, abstract, and several descriptors. That is, for most searches, you can get relevant results with a simple search that includes multiple terms, rather than needing to use commands such as AND, OR, or use quotation marks.

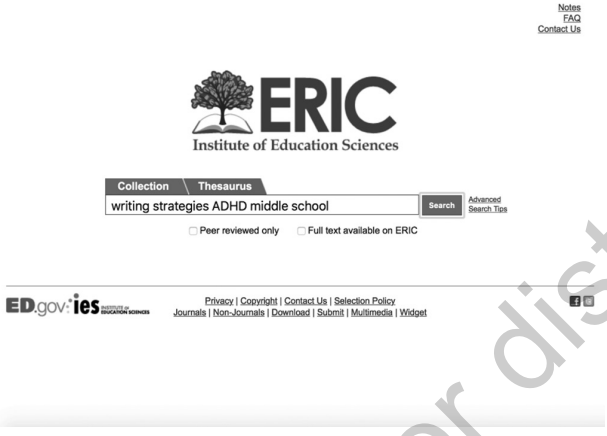
To search the ERIC database, log in to eric.ed.gov and enter your search terms. Let's say you were interested in writing strategies for middle school students who have ADHD. Figure 2.2 shows the ERIC home page with search terms entered.

After you click on the search button, a new screen will appear with the most relevant matches to your search terms. See Figure 2.3.

Understanding Search Results. Based on this search, there were 15,045 results, as you can see from the upper right-hand corner of the screen shot. That's obviously a lot to comb through. Fortunately, you can quickly and easily narrow your search in many ways. First, you can check one or both of the boxes at the top for "Peer reviewed only" and "Full text available on ERIC," and then click on the search button again. That will narrow your search output to only records that have been reviewed by professionals and/or only to search output that has records in which the full text of the article or report is immediately available to you through ERIC.

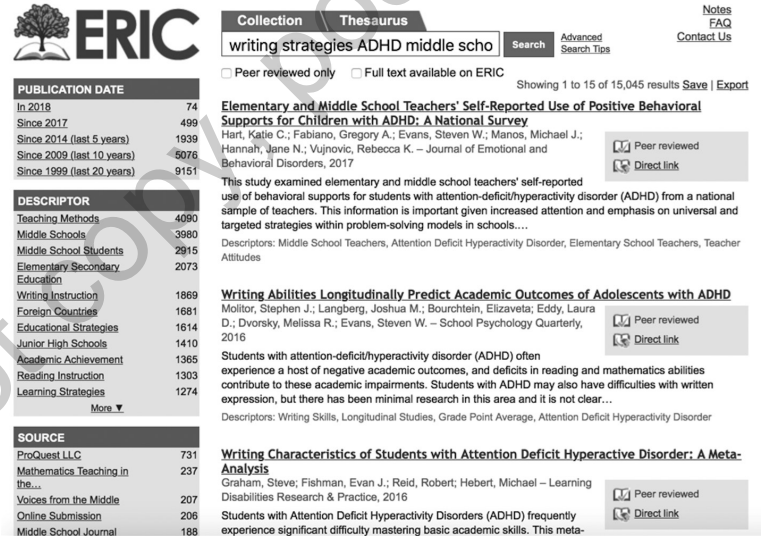
Secondly, you can narrow or limit your search by the fields that appear on the left-hand side of the screen shot in Figure 2.3, including Publication Date, related descriptor terms, Source, Author, Educational Level, Location, What Works Clearinghouse Rating, and a few others. Numbers appear next to each limiter such as those under Publication Date, that is, there are 5,076 records (of the original 15,045) in the search available in the last 10 years. If you click on that limiter, a new search output will appear only with the 5,076 records. Thus, you have limited the search output to about a third of the original. You can add multiple limiters to your search, and they will all appear at the top of your screen. You can also click off any limiters afterwards, if you wish to expand your search again.

FIGURE 2.2 ● ERIC Search



Source: US Deparment of Education, https://eric.ed.gov/

FIGURE 2.3 ● ERIC Search Result



Source: US Deparment of Education, https://eric.ed.gov/

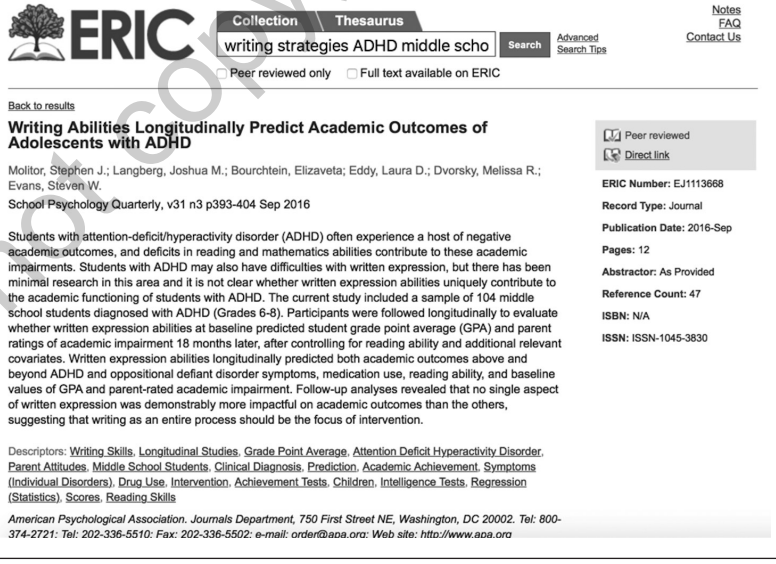
On the ERIC home page where you started (Figure 2.2), you will notice a link for "Advanced Search Tips" on the right-hand side of the screen. If you were to click on that, a new page would open that offers a YouTube video on searching ERIC, as well as information about how to conduct more specific searches if needed.

Now, let's go back to your original search output in Figure 2.3. Rather than narrowing or limiting your search right away, let's say that as you peruse the first 15 records, you see several that look promising. For instance, let's say you decide to look at the second one listed and click on the title, which is a hotlink. You will then get a screen that looks like Figure 2.4, which includes an abstract of the journal article.

You will notice that the ERIC document reference number, the title, author, and other identifying information are listed, including the publication type, which tells you this document is a journal article, and the number of pages in the document. The number of references indicates whether this document provide leads on other sources on the topic. Below the abstract, the document lists descriptors that are present in this record, including the ones from your search.

Let's look at the abstract for a moment. This article is about middle school students with ADHD and about their writing abilities. The date of the publication is very recent, fitting well within our criteria. All in all, this article would probably be worth tracking down. Sometimes ERIC provides a link to a free downloadable PDF version of the actual article. By accessing that, you will, of course, save yourself time and possibly some money. This abstract doesn't indicate that a free PDF can immediately be downloaded, but if you click on "Direct link" on the right-hand side, you can see if you can still get access to the full text. In this example, when you click on "Direct link," a new screen appears to link you to a page outside of ERIC, in this case, to the journal publisher. In this case, the publisher is not offering a free downloadable copy of the article. Therefore, you have three options: a) try to locate the actual article at your local or university library, b) back up your search to look at other records in your original search output and investigate those (Figure 2.3), or c) at your original search output, click on

FIGURE 2.4 ● ERIC Abstract of Article


ERIC

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Peer reviewed only Full text available on ERIC

Back to results

Writing Abilities Longitudinally Predict Academic Outcomes of Adolescents with ADHD

Molitor, Stephen J.; Langberg, Joshua M.; Bourchtein, Elizaveta; Eddy, Laura D.; Dvorsky, Melissa R.; Evans, Steven W.

School Psychology Quarterly, v31 n3 p393-404 Sep 2016

Students with attention-deficit/hyperactivity disorder (ADHD) often experience a host of negative academic outcomes, and deficits in reading and mathematics abilities contribute to these academic impairments. Students with ADHD may also have difficulties with written expression, but there has been minimal research in this area and it is not clear whether written expression abilities uniquely contribute to the academic functioning of students with ADHD. The current study included a sample of 104 middle school students diagnosed with ADHD (Grades 6-8). Participants were followed longitudinally to evaluate whether written expression abilities at baseline predicted student grade point average (GPA) and parent ratings of academic impairment 18 months later, after controlling for reading ability and additional relevant covariates. Written expression abilities longitudinally predicted both academic outcomes above and beyond ADHD and oppositional defiant disorder symptoms, medication use, reading ability, and baseline values of GPA and parent-rated academic impairment. Follow-up analyses revealed that no single aspect of written expression was demonstrably more impactful on academic outcomes than the others, suggesting that writing as an entire process should be the focus of intervention.

Descriptors: Writing Skills, Longitudinal Studies, Grade Point Average, Attention Deficit Hyperactivity Disorder, Parent Attitudes, Middle School Students, Clinical Diagnosis, Prediction, Academic Achievement, Symptoms (Individual Disorders), Drug Use, Intervention, Achievement Tests, Children, Intelligence Tests, Regression (Statistics), Scores, Reading Skills

American Psychological Association. Journals Department, 750 First Street NE, Washington, DC 20002. Tel: 800-374-2721: Tel: 202-336-5510: Fax: 202-336-5502: e-mail: order@apa.org: Web site: http://www.apa.org

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IN THEIR OWN WORDS

Tips for Conducting an Electronic Search

Courtney Valdes, master's degree student

1. *Keep it simple.* You may be researching the effects of parenting style on the language development of at-risk children, but if you enter that mouthful into a search database, you may find exactly nothing. Instead, focus on the key terms, such as *parenting style, language development*, and *at-risk children*.
2. *If at first you don't succeed, search, search again.* Didn't find much? It's more likely that you weren't searching properly than there is no literature on your subject. Most databases employ very specific descriptors (descriptive terms) for cataloging articles. Try using different, but similar terms. For example, use *literacy* instead of *language development*, or broaden the term *at-risk children* to *at-risk*.
3. *Descriptors, descriptors, descriptors.* Sometimes common sense just won't cut it, and you will need to do a little extra legwork to find descriptors that will work for your search. In these instances, you have two choices: you can search the Thesaurus of ERIC Descriptors, or you can look at the descriptors listed for the few articles your search turned up or for articles that may not exactly fit your needs but touch on some aspects of your topic.
4. *Look beyond the abstract.* Don't get seduced by a pretty abstract. Often the abstracts don't give a completely accurate picture of the article they are representing. Therefore, it is best not to stop your search after finding one or two articles that might fit your topic. If you have access to an electronic database of articles, you can actually review the articles before ending your search. Otherwise, gathering a good list of potential articles to take with you to the library could be a real time-saver.
5. *Don't forget to read literature reviews.* Even if an article doesn't exactly meet your needs, other research referenced in its literature review might. This can often be a quick and effective way to find relevant literature for your paper. Once you have a reference for an article, you can enter its author(s) or title into the database and—voila!—you've found a great article for your review, or at least some useful descriptors to help you continue your search.

the box at the top of the screen that says "Full text available on ERIC," hit the search button again, and review the records that come up there with free downloadable PDFs. You may need to do all three things in order to acquire a sufficient number of articles for an adequate review and analysis of your topic/problem.

If at First You Don't Succeed. To summarize the search process, you know that you have to pick a topic that is of interest to you. It must also be sufficiently well defined so that an electronic search is efficient but broad enough that you have enough literature to draw from in your written product. As you can see, the search process is often iterative, and requires flexibility in looking, as well as using limiters. In addition, after reading an article, it is a good

idea to look at the reference list. The author(s) of the article may have cited other literature that you should look at too. Read the advice of a graduate student in In Their Own Words.

Before concluding, this is a good time to introduce you to the practice of relying on **primary sources**. Primary sources are the original literature pieces written by authors whom you wish to cite in your paper. You can also choose to cite what others have cited, but then you are relying on those authors' interpretation of those sources, now called **secondary sources**. Secondary sources might include existing literature reviews, such as those published in the *Review of Educational Research* or the *Handbook of Research on Teacher Education*. These may be great for helping you sift through a lot of literature or validating your analysis. Nevertheless, the rule of thumb is this—whenever possible, find the primary source, read it for yourself, and cite it if it fits within your review parameters.

Putting It All Together

Identify three potential research problems or phenomena of interest.

1. _____
2. _____
3. _____

Write a possible research question for each of the above research problems.

1. _____
2. _____
3. _____

Write a possible hypothesis for each of the above research questions.

1. _____
2. _____
3. _____

Summary

The first part of the chapter discussed identifying research ideas and narrowing your problem focus. It is important to point out that these efforts, while essential at the beginning of your research, sometimes reoccur later as well. That is, you may define a problem initially and then clarify, or even redefine it later after conducting a literature search and review. Keep this thought in mind as you turn to the next chapter. You see, research is a far more iterative or even recursive process than a linear one. Even though the author suggests that you take the time to focus carefully on a specific research problem and then write good questions and hypotheses (when appropriate to the method) early in the process, you will likely continue to revise your questions and hypothesis even as you later shape your research design and method. Designs and methods are discussed in Chapters 5, 6, and 7. Chapter 8 on proposal development will refer to research questions yet again in order to apply and extend your understanding as you link your questions and hypotheses to design and methods.

To conclude, consider the following anonymous "thought for the day": "A problem well stated is a problem half solved." There is a great deal of truth in that, and it is particularly true for writing good research questions and for selecting a research design and methods.

Discussion Questions

1. What is the difference between a research problem and a research question?
2. What makes a good research question?
3. What's the difference between a research question and a hypothesis?
4. Is this a good research question? Why or why not?

   Does peer tutoring affect the performance of ESL students on essays written in language arts classes?
5. Is this a good research question? Why or why not?

   How can I improve student grades in science?
6. How might making decisions about what to include and exclude from your search be valuable *before* you begin your literature search?
7. What are the advantages and disadvantages of using a database such as ERIC over using a search engine such as Google?

Your Research Project in Action

Based on your completion of activities in Chapter 2, select the research problem you are most interested in and conduct a literature search using the ERIC or another database. Use the following guide.

Research problem: _____

_____

Keywords to search by: _____

_____

Did those keywords pull up documents? Yes No

Were there too many documents or not enough? Too Many Not Enough

Redefine keywords to search by: _____

_____

Find five resources that have abstracts directly pertinent to your research problem.

1. _____
2. _____
3. _____
4. _____
5. _____

Identify which of the resources are primary or secondary sources.

Primary	Secondary
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Further Reading

Gall, M. D., Gall, J. P., & Borg, W. R. (2006) *Educational research: An introduction* (8th ed.). London: Pearson.

This book has been highly referenced by many graduate students for many years. Qualitative and quantitative methods of study are presented, compared, and analyzed in great detail. The authors describe the interconnections among educational research, educational philosophy, and educational practice.

McMillan, J. H. (2015). *Fundamentals of educational research* (7th ed.). London: Pearson.

This book is an introduction to education research for students who want to conduct research, particularly in their own settings. Research credibility is a central theme of the book. The book includes tools to facilitate this research process, such as technology activities, personal author reflections, and self-test questions and answers.

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