The Power of Questions

A Guide to Teacher and Student Research

Chapter 5 The Research Design (handwritten)

Beverly Falk and

Megan Blumenreich

Five

The Research Design
Developing an Action Plan
for Your Inquiry

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Research is formalized curiosity.
It is poking and prying with purpose.
—Zora Neale Hurston

After exploring what others know about your question, making a plan of action for your own study can help you proceed with your investigation. Although it may be tempting just to jump right in and begin collecting data, developing a plan will give you a working document to help you ensure that your research is sound—that it is systematic, based on evidence, and credible. Once this plan is developed, however, it should not remain static. Rather, it should serve as a flexible guide throughout the life of your study. Just as the ideas and interactions of your students influence and alter your curriculum plans in the classroom, the data you collect during the course of your inquiry should inform and shape how you proceed.

Your research design should flow from your question and sub-questions. Everything you decide to do should be aimed at getting answers to these questions. But before you begin your exploration, you need to consider and make decisions about *how* you will proceed. The following is an outline of what you need to figure out:

Research design

   1. Statement and explanation of your research question

      a. The research question and subquestions

    b. Overview of what you plan to do in your study

    c. Context and background for your study

2. Methodology

    a. A description of the study participants and setting

    b. Data sources

    c. Data collection plans

    d. Data analysis plans

3. Time line for your study

4. References

Making this plan will help you clarify exactly who and what you will study as well as when and how you will study it. It will also help you start to think about how you will analyze the evidence you collect. The decisions you make about each one of these issues will impact what you will learn from your investigation.

Relevant data

When you formulated your research question and subquestions, you also developed an overview of how you plan to approach your study and prepared an explanation of the background and context that influenced your choice. Now you need to work out the details of how you are going to find answers to your questions.

Who are you going to study? The first thing to determine is exactly who you are going to study. In research terms this is called *defining your study participants* or *sample*. The nature of your question and what you decide to do to pursue answers to your question will greatly impact who you examine. For example, when teacher researcher Cristina Castellon studied the impact of inclusion on both regular and special education students, it was fitting for her to explore her question by looking at all the students in her class:

> I looked at the regular education and the special education
> students in my first grade classroom in the South Bronx. I
> looked at twenty-one children ranging in age from six to
> seven years. The demographics of the class consist of Latino
> and black students with one Guyanese child.

For Michael's study of discipline, it also was appropriate to focus on the dynamics among all the children in his class:

> I studied my class and to a lesser degree the other 5/6s class in our school. We share deck time with the other class so it gave me an opportunity to test management strategies on students other than my own.

However, when teacher researcher Loretta Francis was investigating discipline techniques for difficult children, she focused her study on only those children in her class who were a challenge in that regard.

Sometimes decisions about whom to study are made for reasons of feasibility. If your question lends itself to focus on a select group, it is important that you describe who you have selected to study and what criteria you used for your selection. Teacher researcher Matthew Steinberg did this in his study of how to foster student engagement in his fifth grade classroom. He explained:

> I selected six students ... from among the thirty students in my class because of their observed level of motivation. I identified two students who were at the low end of the spectrum, two students who fell in the middle range, and two students at the high end of motivation. These students were chosen as a result of my observations of their level of engagement during the first six months of school. [I looked at] their participation in class discussions, the thoroughness and effort on their assignments, both in class and out, as well as the students' initiative in beginning and working on class assignments.

Bridgette, too, decided to study only four of the girls in her class for her inquiry about the impact of single-sex literature circles on female students. As she described the girls she chose and how she selected them, she provided details about each one:

> The participants of this research study are four girls in my seventh grade literacy class. Although all the girls score well on statewide standardized assessments and receive high marks in literacy class, they have differing social and reading habits.

Julie is a very avid reader but only when reading very specific novels of her own choosing. She is vocal in large-group discussions, although not nearly as vocal as the four or five dominant boys in the class, and is popular with the boys and girls in her class.

Alex is also an avid reader who enjoys many types of books, although mostly contemporary novels with a female heroine. She is silent in class discussions, almost never participating, especially in open-ended, thinking discussions. Her family pushes Alex to read, even creating a book club for her and her friends.

Ginny has the highest grade and test scores in her class, and participates less than Julie and more than Alex. She is a reluctant reader, citing mystery as her favorite genre, although usually during independent reading time she appears to be daydreaming rather than entranced in her book.

Lastly, Kristin is a leader of her peers in social situations, and appears to be more reserved and contemplative than many of the other students. She is often silent in large-group situations, but always appears attentive with her chair posture, consistent note taking, and eye contact. She reads well but her reading is usually during assigned periods, rather than self-initiated.

I chose this sample of girls to be in the single-sex literature circle partially due to their exhibited success in literacy class. I felt their high reading ability would lend itself to less disciplining to make the girls complete their assigned readings and to more available time for discussion and debate. In addition, the girls' differing reading and social habits promise to provide a full picture of how an all-girl literature circle can affect the girls' enjoyment and comfort in discussion of a book.

Notice how Bridgette included, in her description of her study participants, only as much background information as was needed to provide a context of her study. This is also what Michelle did to describe the child she studied for her investigation of how to support a child with special needs:

The participant in this study is Kareem—a five-year-old, African American boy who has a speech impediment, and

who was [diagnosed] at two years old as developmentally delayed in language acquisition through an evaluation by state evaluators. He did receive related services when he was four years old but no longer receives related services because he has "aged out" of the program. It is now the responsibility of his parents to get outside services. His mother is a part-time cashier, mother of three, and attends a junior college. His father lives in the household and does not work.

Notice here how Michelle did not reveal the identity of her study participants and how she provided background information in a factual manner, avoiding judgments, evaluative statements, and/or details about the child and his family. This is important to watch out for. What you choose to include or not include about your research participants, as well as how you convey that information, are all conscious or unconscious interpretations and acts of analysis that impact the study's credibility (Geertz, 1973).

This is especially important for all of us to keep in mind when working with people who come from backgrounds that are different than our own or who have different perspectives other than our own. Our own backgrounds and philosophies of education can influence how data are presented and viewed. That is why it is helpful to provide information about yourself and your own background as you describe your study's participants, especially if you are a "participant–observer" (i.e., your study is about your work in your class). Doing so will make it easier for others to understand and interpret your findings. Michelle explained herself as the participant–observer this way:

> I was also a participant in this study as a researcher and observer. I am a twenty-nine-year-old African American teacher who has worked in the early childhood field for ten years, but has never worked with young children who have special needs up until now.

Describe the setting of your study ○ A description of the context of your study helps to inform others about how to interpret your findings. This section of your research design may include a description of the school setting, the outside community, and the classrooms or other settings where the study is taking place. A description of your study's setting can also help you

think through the potential benefits and pitfalls of the setting and clarify what aspects of the setting might affect your data collection process.

Jumel's description of his school setting was critical to understanding his study of his sixth grade students' feelings about using Standard English in school. He obtained statistics to provide a portrait of his school and community:

> Intermediate school XXX is located in the Upper Manhattan area of Harlem. I.S. XXX shares the school building with elementary school XXX. The school consists of approximately 470 students. It is on the state's S.U.R.R. (School Under Registration Review) list, which means that I.S. XXX is a low-performing public school that is targeted for corrective action. The school supposedly runs the risk of being closed if significant improvements are not made. Eighty-three percent of the students are "African Americans." Fifteen percent of the students are "Latino" children and 2% are "Other." The students live in public housing projects and other neighboring buildings located around the school.

Note that Jumel avoided using the school's name and purposely did not provide information that would help readers identify it. Later, in his story about his class, he also protected the privacy of his study's participants by using pseudonyms instead of real names.

What data will you collect? Among the data sources most commonly used by teachers for their classroom inquiries are observations, interviews, pictures, videotapes, audiotapes, journals, surveys, samples of student work, and other documents. (These data collection tools will be discussed more thoroughly in Chapter 6.) As you think about which of these you will collect for your study, there are two important things to remember. The first is to use your research questions to guide your choice of which kind of data to collect. Think about how each data source you decide to use will answer each one of your questions. One way to help you figure this out is to make a chart that lists your research question and subquestions in the left column, with your data collection tools across the top. Make Xs in the chart to explain what data source will give you answers to what questions (see Figure 5–1 and Exercise 1 at the end of the chapter).

It is also important to remember, as you decide what evidence you will collect for your study, that you will need to use multiple data sources to

pursue your question. A minimum of three different sources is generally recommended. This "triangulation" of data helps you see things from multiple perspectives and thus adds to the reliability and validity of your findings.

Triangulating your data can be done in different ways: studying a phenomenon through *multiple data techniques* (for instance, collecting observations, audiotapes, and photographs) or looking at a situation from the *multiple points of view* of the participants involved (such as caregivers, students, and teachers).

Here is an example of how Shenaz decided to triangulate data for her study of how to make her reading and writing conferences more effective. First she described how each data source would help to answer her questions. Then she made the chart (Figure 5–1). She chose different *kinds* of data sources that would provide her with different kinds of information about her students and her teaching:

> I am going to collect the following data: personal journal, student work, conference notes, and formal assessments.
>
> The *conference notes* that I will collect will reveal to me what I have learned about each student and what I have taught them. As time progresses, the notes should reveal more about me and how I conferred with each student. These notes will also show me the direction my mini lessons are going to go. Over time I should be able to see in my conference notes if children are using the strategies and skills I have taught them, and as a result how they grow as readers and writers.
>
> I will also reflect in a *personal journal.* This journal will allow me to take a deeper look into how each of my conferences went. It will show the growth in my conferring. The journal will allow me to learn what my strengths are in conferring with my students. It will also point out the areas that I need to improve and begin to work on them, such as shortening my conferences or making better teaching decisions.
>
> My *students' work* will also show the growth in my conferencing. I should be able to see explicitly in their writing over time how they have grown through my one-to-one teaching. Their work will also reveal to me what I need to teach them during our conferences. As I evaluate their reading I will see the children using the strategies I have taught them in our reading

conferences. The same will go for their writing, which will reveal in what area each child needs help, therefore allowing me to focus on that area during our conferences.

The children's growth should also show in the *formal assessments* I will use. The beginning of the year formal in-class assessment will be compared with the one given in the spring.

Figure 5–1. How Data Aligns with Subquestions Chart

Subquestions	Data 1 personal journal	Data 2 student work	Data 3 conference notes	Data 4 formal assessment
How do I manage conferences in a Reading and Writing Workshop?	X		X	
What do you do in a reading and writing conference?	X	X	X	
What do you do with the information you gain from conferring with students in a Reading and Writing Workshop?	X	X		
How does conferring with students help them become better readers and writers?	X	X	X	X

A different rationale for the choice of data sources was given by teacher researcher Swati Mehta for her examination of how the concept of identity developed in three adolescent Indian American women. Because she was trying to understand the young women's perspectives on their identity, she decided to collect data that would give her different windows into their thinking: observations, interviews, and the participants' writing samples. Swati's explanation of her data collection and analysis process demonstrates how her choices matched the purpose of her research questions and the theoretical framework of her study:

> This study is qualitative in its nature. The data were collected
> through three means: observation, interview, and the writing
> of the participants. The data were collected to inform me in
> different ways about how these women perceived their lives.
> Observation allowed the reality to be expressed through
> their experience. Interviews allowed the voices of the partic-
> ipants and their parents to surface. Writing, finally, allowed a
> personal expression of the participants' thoughts and feel-
> ings about identity. The purpose was thus to weave together
> the lives of these women through the lens of seeing them as
> multicultural, with multiidentities, and multirealities. The
> purpose was not to place judgment, and thus data were not
> looked at for finding cultural contradictions within the lives
> of these women. Instead, I aimed to understand the truths
> that these women created. As a result of the framework,
> typed-up notes and final narrative stories and analysis were
> shared with all three participants to establish a way to cross-
> check the data that led to their unique identity stories.

Swati's decision to have the participants "cross-check" her data analysis was one more way to ensure that she was getting these women's perspectives on their identities.

How will you collect your data? In addition to figuring out what data you will collect for your study, you also need to make plans for who will collect the data, where and when each type of data will be collected, and how long the data collection process will go on (see Exercise 2 at the end of the chapter).

Try to think through the specifics about the time of day (and dates if possible) that you will collect data, the area of the room or the cur-

riculum time where you will collect the data, and exactly how you will be collecting it (if notes, in a notebook?). If, for instance, you are making observations, plan how often you would like to observe and how you will focus the observations. If you plan to conduct a survey or if you are interviewing, think through the questions you will ask, who you will survey or interview, where the interviews will take place, and how long you might expect each session to last. (More details about how to figure out these issues can be found in Chapter 6.)

Here is how Shenaz planned to collect data for her study of reading and writing conferences:

> I will collect all my data for approximately eight to ten weeks. The conferences and formal assessments will take place during the Reading and Writing Workshop periods within my classroom. During this same time I will collect my conference notes. My personal journal, however, will not be done during Reading and Writing Workshop. I will write in my journal each day after school when I have time to sit and look through any conference notes and reflect without distractions.

Bridgette described her data collection methods for her study of all-girl literature circles in this way:

> I will collect my data in about four weeks in the K–8 school in which I work. I will collect the data in two ways: First, I will observe the girls during our regular class periods three times for approximately thirty minutes each, while they and the other thirty students are engaged in literature circles. Then I will meet with the girls in our classroom during lunch or another noninstructional period three times to discuss my observations. I will also collect written responses from each girl on a rolling basis throughout this period.

Ethical concerns

As you plan the kind of data you will collect, it is important that you take care to be respectful of your study's participants. Although you may be clear that the purpose of your inquiry is to understand and improve your practice, this goal may not be apparent to those you are studying. So before you begin, it is best to inform those who are involved about your intentions and to get their permission to allow you to study them. They

always have a right to refuse to be the focus of your attention. You can do this with a permission letter, often referred to as *informed consent.*

Now, it may *not* be necessary to get permission for the data you collect if you plan to use what you learn from your study only for your own or your students' growth and development. For instance, collecting student work for diagnostic purposes and keeping notes on classroom activities for the purpose of shaping your curriculum and meeting students' needs do not require permission because these activities are simply a part of good teaching. However, if you intend to share the information you are collecting with a wider audience—to present at a districtwide conference, a professional symposium, or to write for publication—there are several important reasons why permission should be obtained from those who are the subject of study.

One reason is that study participants need to be informed if your study has the potential to expose them to any harm or risk. This concern is greatest in experimental studies, during which a potentially harmful or helpful intervention or treatment may be applied to or withheld from one group and not another. Although harm to study participants is unlikely in the kind of naturalistic, qualitative study you are doing, because only natural events are being documented, the mere fact that something is being studied *can* affect what happens. So, in addition to doing your best not to let your study impact anyone's experiences negatively, you need to assure all those involved about any possible potential for harm to occur.

A second reason to ask permission to carry out your study has to do with concerns about privacy. Even if anonymity is ensured by using pseudonyms instead of participants' real names (which should always be standard procedure if you intend to share your work publicly), potential study participants may not want you to take work samples, photos, or videos of them or their child for personal, religious, or other reasons. So check to make sure that it is OK to do this.

Yet another reason to obtain consent is that some people may be wary of how they will be perceived or represented by you, the researcher. This is understandable given the bias, discussed earlier, that we sometimes unwittingly bring to what we see and do.

And finally, participants need to be assured that their involvement in the study is purely voluntary—that should they decide not to be involved, they will be not be treated negatively by you in any way.

Once you have considered all these issues, craft a permission letter to those involved in your study. Before doing this, check to see if your

school or school district has policies on research in the classroom. There may be an official approval process that you must go through. Or, you may find that your administrator wants to be involved in the construction of your consent forms. In any case, be sure that your consent letter explains your study and its purpose; includes information about the data collection process, possible risks, and the potential benefits the study might yield; efforts you will make to protect the participants' privacy; and assurances that involvement is voluntary and participants, at any time without any negative consequences, may decide that they do not want to be involved.

You can find out more information about how to craft and administer research consent forms on most university websites, because university researchers have to get approval for any study they undertake from their institution's institutional review board. You can also find a permission request template available for your use in one of the websites listed in Appendix 5 or at *www.landmark-project.com/permission1.php*.

On the next page is an example of a consent form that teacher researcher Nkenge Mayfield sent home to the families in her class before embarking on a study of how to use unit blocks in her early childhood classroom. Notice how the letter is written in easily understandable language.

There are a few more things to think about and plan for before you begin to collect data for your study. You need to consider how you will go about analyzing your data and what time frame you will follow to complete your study.

How will you go about analyzing your data?

Considering how you will analyze your data is an important part of your research plan. Before developing this section of your plan, you might want to read Chapter 7, which discusses data analysis in greater detail and provides you with specific procedures for how to draw conclusions from your evidence. But now you need to think about how to use the data you collect in your study not only to draw conclusions at your study's end, but also to inform and shape it as it unfolds. Reviewing your data in an ongoing way throughout the process of your study can help you to formulate impressions and hunches, grow theories, and evolve themes that will affect how you proceed. This ongoing analysis may lead you to look at things you might not have planned to examine, to talk to people you might not have thought of interviewing, or to collect evidence you might have not thought was necessary.

Dear Families,

I am working on a study this year of how I can use unit blocks in our class curriculum to enhance children's development. Although the project is in the early stages of development, I anticipate that I'll be looking at the children's play with blocks, taking pictures of their structures, and, from time to time, recording their conversations while in the block area. I also will be making copies of some of the children's writings and drawings, with their permission. The purpose of this documentation will be to give me a chance to examine closely the children at work in the block area in a way I cannot ordinarily do in the midst of the busy classroom day. I hope that this study will help me better understand how to use blocks more effectively to support the children's learning in our classroom.

Although I don't know, as of yet, what exactly I will or will not include in my study, I would like to have your permission to use the information I learn from your child, as well as any photographs of your child or any writing or drawing that your child might make. I do not foresee any risks to your child from participating in this study. And please be assured that in any reports using this research, a fictitious name will be used to protect your child's privacy.

Please sign this form and return it to me by_____. Should you decide that you do not want your child to participate, your decision will not be held against you in any way. Should you agree to participate but change your mind later, your wishes will be respected.

Thank you very much.

Your child's teacher

_____

I give permission for my child to participate in the study on blocks.

_____   _____
Child's name   Parent's signature
(please print first and last name)

Date: _____

Although it is not possible to figure out completely all the details of your data analysis until you have settled on your questions and collected your data, you want to make sure your analysis plan includes ideas for how to organize and review the data as you proceed. As you learn more about your research topic and your study develops, this plan will change and get more detailed. Begin here, however, by thinking about how you will use the data you collect to inform your study in an ongoing way, how you will organize your data as you collect it, at what points in the data collection process you will review/analyze it, and what method you will use to analyze your data and develop your findings (see Exercise 3 at the end of the chapter).

Here is how Shenaz first thought about how she would analyze the data she collected for her study of reading and writing conferences. Because she wrote this at the beginning of her study, she had a clear idea of how she would review and use her data to inform her teaching and the progression of her study, but she had not yet developed the details about how she would come up with the overall findings of her study.

> I plan to look over my conference notes every week so I can determine what mini lessons I need to plan for the following week. In my conference notes I comment on what the students are doing, and if they are doing what I taught them in their last conference. This allows me to determine if my students are learning and implementing what I have taught them.
>
> In my personal journal I reflect at least three times a week on my conferences for the day. I record in my journal what I think I did well and what I need to work on. Reviewing it every two weeks will allow me to determine what I need to work on and what I am getting better at.
>
> My students' work will be reviewed every two weeks. I analyze student work before I have taught something in a conference and then compare it with student work a couple weeks later. This allows me to determine whether they are applying the strategies I have taught them during my conferences.
>
> Finally, I will collect and review the district's formal in-class assessment in March at the end of my study to see if the students have grown in their reading and writing.

The following analysis plan, developed by Natalie for her study of how to support her students' independent learning in centers, focuses on both formative and summative data analysis. In her description of her plan she explains how she will use a chart (below) both to analyze and store the data she will collect for each of her research subquestions. (See Chapter 7 for a more detailed explanation of how to create a data analysis chart.)

> The themes I will use for organizing (coding) my data are the topics of my subquestions:
>
> 1. Evidence of children being their own teachers
> 2. Evidence of play in centers impacting development
> 3. Anecdotals used to drive teaching
> 4. Extensions of mini lessons in play
>
> I will assign a different color to each theme and use a chart like the following to keep my dated observations, photos, and work samples organized.

Evidence Collection Chart

Evidence of:			
Children as their own teachers	Play in centers impacting development	Anecdotals used to drive teaching	Extensions of mini lessons in play

> By using this chart as an ongoing tool for analysis, I will be able to note which areas might be lacking data and I can then focus my observations on these areas. As I fill in the chart, I will be beginning the process of analyzing my data. I will look for patterns in my observations and evidence of the social, physical, emotional, and behavioral development of children in centers. I will also use this chart to do an overall, final analysis when all my data are collected.

Teacher researcher Melissa Sugrim's data analysis plan for her study of developmentally appropriate literacy practices explains how she will organize her evidence around her research subquestions and how she will label and color code the evidence for each subquestion. (This process is explained in detail in Chapter 7.)

> I will read through all my data, which will include my observations, photos, samples of children's work, and my reflections on all these. I will then organize my data according to their various themes or categories, and then color code my data to highlight those observations and reflections that are associated with each specific theme or category. For example, a highlight of green will indicate environmental support of literacy, a highlight of blue will indicate teaching practices/strategies that support developmentally appropriate practices in literacy, and a highlight of pink will indicate how the curriculum supports developmentally appropriate practices in literacy. Next, I will revisit my data to ensure that all data have been color coded accordingly. Each reflection will be numbered and every work sample and photo labeled. Work samples will be labeled S1, S2, S3, etc. Photos will be labeled P1, P2, P3, and so forth. The next steps will be to match these work samples and photos with their supporting reflections.

In contrast, teacher researcher Sheri Rothman's plan for her study about how to increase students' problem-solving abilities in mathematics, explains how she will organize her data not around subquestions, but around themes that emerge through the course of the study. Note how she also describes her process for ongoing analysis and organization of her data.

> Because I will be keeping all my interview and field notes in a spiral notebook, it will be easier for me to analyze them. The notebook has a built-in margin on each page where I can notate general categories for each piece of information. Categorizing notes in the margins will help me to get an idea of what is in the notes, in what order, and will provide me with a way to reference something quickly just by scanning the side of the page.

I will also create an index to help me narrow my focus. I will list all categories and the pages in my notes where they appear. It will help me to see how often certain categories appear. I will also free write on the categories that appear the most often, so that I can see what patterns and themes emerge.

I will probably use my journal to write narrative memos that help me to capture thoughts and ideas that I don't want to forget. The memos hopefully will allow me to see what direction to move next.

Although these data analysis plans describe different ways to analyze data, they are similar in that they each help the teacher inquirers who wrote them to think through in advance what they plan to do.

Creating a time line for your study

Creating a time line is a useful strategy to help you make sure you complete your study. We all know how easy it is to procrastinate and how life inadvertently gets in the way of even some of the best-laid plans. Thinking in advance about the time it will take to get things done can help you stick to your intentions. Because your inquiry may be affected by so many things outside your own will or control (school holidays, vacations, school testing days, unforeseen school or personal events), planning around them in advance, to the extent that you can, will help you get a realistic sense of the challenges you will face and how you can proceed.

An important issue to consider when planning the time frame for your study is whether the question that interests you now will be important or even feasible to investigate when you are ready and able to collect data. This issue came up for one teacher researcher who got interested in separation anxiety at the beginning of the school year when one of the children in her early childhood class was having trouble beginning the school day and separating from his mother. She reconsidered her choice of questions, however, as she realized that the period of the child's separation difficulties could (hopefully for everyone involved) be short and not leave her enough time to do the kind of in-depth investigation that she wanted to do.

To help you figure out things like these, sketch a plan for when and how much time you will need to collect your data, analyze the data, review the literature about your question, draft your findings and conclusions, and revise what you have done for the final draft. Make sure that you build in time to review your evidence frequently so that you can see

repeating patterns, share your thoughts with others, feel confident about your emerging findings, and put care into how you draft and revise what you have learned (see Exercise 4 at the end of the chapter).

Your time line should look something like this one that Natalie created to pace herself through her study:

December: Construct my research design and begin my literature review.

January: Work on my literature review and begin collecting data.

February/March: Continue collecting data, reviewing/coding/ analyzing once a week.

Mid-March: Analyze all the data for findings and conclusions.

April/May: Write first draft of what I have found, revise, and write a final draft.

As you make your plans, remember that things always take longer than you think. So keep your schedule flexible. Along the way, expect that you will get frustrated or confused, or that your questions may evolve and change. Don't be surprised if you realize at some point that the data you are collecting are not providing evidence that will answer your questions. And don't despair if your emerging ideas and understandings are difficult to express in written form. Expect setbacks to happen and changes to be needed. It is all part of the messy process of learning in uncharted terrain.

Citing your references
As you make the plan for your study, you will likely want to consult other literature related to your question. You read about how to do this and how to create a reference list in Chapter 4. Although you may not complete a full review of the literature prior to formulating your research design, you will at least want to gather a list of the references you will consult. Other people's studies of your question may give you ideas for how to investigate it. Writings about your topic may offer suggestions that you may want to try out and examine in your investigation. From the beginning, don't forget to keep track of all the details about the sources (volume number, issue number, pages, etc.) that you will need for your reference list.

Reviewing your work: Consulting with a critical friend
As you may have experienced in your work with students, peer consultation and editing offer a powerful opportunity to share and fine-tune

your ideas in a safe and constructive environment. During all our inquiries, as either teachers or researchers, having a "critical friend" with whom to share ideas, teaching strategies, curriculum plans, or research drafts can be an invaluable support to our learning.

Working with others who are either tackling similar issues in their classrooms or conducting their own studies can be very helpful. Finding a "critical friend" who can review and talk with you about your design in draft form can help you to uncover new ideas or find potential blind spots. A critical friend can suggest ways to "tighten" the design or help you make sure that each element of your plan makes sense. Exercise 5 at the end of the chapter offers some questions your critical friend can ask as he or she reviews your research design.

As your study progresses, other questions may emerge that you can bring to your critical friend. Don't be afraid to use others as a sounding board for your questions and to let ideas that develop throughout the process transform the elements of your initial design. Inquiry is not a linear process.

Planning inquiry projects for children

Children's questions are windows into their thinking and an ideal entry point for planning curriculum. To do this effectively we first need to inquire ourselves about what they understand, the problems they encounter, the strengths they bring to their learning, and then use these understandings to shape the curriculum as well as inform our instructional strategies. Only when we build into our teaching plans a way to take into account what is happening with our students—through a continual gathering of evidence of what they understand and how they can actually apply their understandings—will we have a way to assess the effectiveness of our teaching, make adjustments to what we do, and heighten the likelihood that learning will occur.

It is not easy to teach in this way given current pressures from high-stakes accountability systems and the resulting emphasis on standardization in schools. The mandated curricula and pacing schedules many of us are forced to deal with offer little opportunity for us to attend to the different paces and learning styles, understandings, interests, or questions of the students we teach. Because of this, we are often unable to take advantage of teachable moments or be responsive to what our students know and can do. And yet, children cannot learn if teachers are not able to respond to their emerging interests, struggles, misunder-

standings, or wonderings. If we are to help learners genuinely learn, their thinking must be able to impact the curriculum. To do this, a balance needs to be struck between the goals and expectations of the larger community and the questions and interests children have (Falk, 2000).

Planning for a group study

Below we describe a process for how to create a plan for a group study that is built on children's questions and simultaneously prepares children to meet the standards and expectations of the external world (Falk, 2000).

After you have invited your students to brainstorm their questions and related subquestions (see Chapter 3), you will need to think through several issues. Review the questions raised by the children and search among them for commonalities. These can be crafted into a theme that can serve as the launching point for a whole-class investigation. For example, your class' previous brainstorming sessions may have raised questions about how airplanes fly, what makes electricity go on, or how water gets to our homes through the faucet. These kinds of questions could be pulled together under the rubric of an investigation into "how things work." Or your class may have asked about how seeds grow, how babies develop, how caterpillars turn into butterflies. These questions could be crafted into a study of "transformations." Coming up with an overarching theme that truly incorporates your students' authentic questions is an art that can be both challenging and fun.

Whatever the theme of the study you create, you can have the class pursue it through group activities as well as individual investigations. As you ponder the different ways to explore, think about the concepts, skills, and disciplinary knowledge that you want (and need) to infuse into the study (see Exercise 6 at the end of the chapter). This will help you generate ideas for how to structure opportunities throughout the study for the children to practice and to acquire desired goals. Think also about the "dispositions" you want to help your students develop. If you want them to become critical thinkers, life-long learners, and responsible citizens, then you will need to build experiences into the study that will nurture these kinds of qualities.

After you have attained some clarity about the goals and purposes for your plan, sketch out experiences, activities, projects, and experiments that will help your students examine the concepts, learn the skills, and develop the dispositions that you intend the study to nurture (see Exercise 7 at the end of the chapter). As you go about this process, try to plan and sequence the learning experiences to capitalize on what you know about

your students' interests and their developing skills. Plan also for activities that utilize many different learning modalities so that children in your class with a range of talents and strengths will be afforded opportunities to use them. Think about how you can incorporate out-of-school activities, such as trips or interviews, to enrich the learning of the study. You might want to arrange for the class to do some kind of community service or you might want to set up a relationship with another class in the school or an outside institution. Think also about how you can involve your students' families in the inquiry. Brainstorm ideas for homework assignments that can deepen and extend class learning as well as strengthen the home/school partnership and bring families into the learning adventure.

Consider also the resources—books, materials, technology, etc.—you will need to support the work. Gathering materials or information about how to access the particular resources your study will require will increase the likelihood that your learning environment is provisioned for optimal learning.

When you have considered all these issues, review what you have designed in relation to the standards and content areas that you are required to address (see Exercise 8 at the end of the chapter). Making a grid, like the one in Figure 5–2, can be a helpful way to keep track of this information.

After the grid is made and you review it, you might find that there is a discipline area or required standard that you have not included in your study design. By planning in advance in this way, you have time to find a way to address what is missing.

As you finalize your plans, make sure that you have built in ways to assess students' progress (see Exercise 9 at the end of the chapter). Checking in with students to find out their developing ideas, to learn the

Figure 5–2. Matching Activities to Standards and Content Areas

Activity	Language arts	Math	Social studies	Science	The arts	Physical education
Activity 1	X		X		X	
Activity 2		X		X		
Activity 3	X	X	X			
Activity 4		X				X

questions that arise or the problems that come up during the course of their work, or to elicit their suggestions for what to do next can provide you with information to shape instruction more effectively. Figure 5–3 offers an example of a response sheet you can develop to ascertain this information.

By regularly reviewing students' ongoing assignments, collecting response sheets that update you on students' progress, and inviting them to air their ideas and questions at class meetings, you can nip problems in the bud and lessen the possibility that students will not "fall through the cracks."

Plan also for some kind of a culminating experience for your study (ideas for this will be discussed in Chapter 8). This will provide evidence of what children have learned through their investigations as well as build community and a sense of accomplishment.

Helping students create plans for their individual inquiries

As we discussed in the previous chapters, individual inquiries offer opportunities to experience the power of doing work that is intrinsically motivating. Providing time in your classroom for your students to engage in individual investigations can serve not only as motivators to learning, but as a way to balance individual needs with the needs and demands of the whole group. Individual studies can be conducted as extensions of a whole-group study or as stand-alone, individualized projects that enable students to engage in learning that is tailored to their interests and skill levels.

One way to help children design their own inquiry projects is to have them create project folders that include personal agendas and planning logs (see Exercises 10 and 11 at the end of the chapter). The aim of a personal agenda is to break down a project into small manageable pieces (Tomlinson, 1999). In the personal agenda each student can outline the tasks that are needed to carry out his/her investigation. Some of these tasks may require working in groups, such as peer editing; other tasks may be strictly independent work. Each student can keep the agenda in his/her individual project folder. A planning log can also accompany the agenda. On the planning log each student can chart his/her daily progress on the tasks outlined in the planning agenda. Personal agendas and planning logs allow students to take charge of their own learning. In addition, they enable tasks to be differentiated for difficulty, and instruction to be individualized to meet the needs and strengths of all the different learners in a class (Tomlinson, 1999).

Figure 5–3. Student Response Form

From this session/class I take away:

I really liked:

I am confused about:

Questions I have that still need to be answered:

Ideas about what to do next:

Exercise 1: Connecting data collection techniques with research questions

In Figure 5–1 we provided an example of how a teacher researcher used a chart to connect her proposed data collection methods to her sub-questions. As you consider different sources, place them on a chart like the one that follows. Write your subquestions down the left side of the chart and think through the data sources in terms of these questions. Mark the sources that have the potential to answer aspects of the questions. In addition, write an explanation of exactly how each data source will inform the subquestions. If a data source will not help you answer your questions, don't use it.

Subquestions	Data 1	Data 2	Data 3	Data 4

Exercise 2: Planning how to collect your data

Answer the following questions as you work out your data collection plan:

- Who will collect the data?
- Where will you collect each type of data?
- When will you collect each type of data?
- For how long will you collect the data?

Exercise 3: Planning how to analyze your data

Answer the following questions as you work out your data analysis plan:

- How will you use the data you collect to inform your study in an ongoing way?

- How will you organize your data as you collect it?

- At what points in the data collection process will you review/analyze it?

- What method will you use to analyze your data and develop your findings?

Exercise 4: Creating a time line for your study

When will you do the following:

- Collect your data

- Conduct a formative analysis of your data

- Conduct a summative analysis of your data

- Review the literature about your question

- Draft your findings and conclusions

- Share your work with others for feedback

- Revise what you have done for the final draft

Exercise 5: Guide for reviewing your research plan

- Have you made clear what you plan to do in your study and why? What information do you feel you still need to know?

- Have you identified your study participants and explained why you have chosen them?

- Are the data you have chosen to collect appropriate for your research questions?

- Do you have multiple sources of data?

- Can you explain how each data source will be used to answer each of your research questions?

- If you plan on using interviews or surveys, have you formulated the questions? Do they get at the information you need to answer your research question?

- Have you worked through all the details of your data collection method?

  a. Who will collect the data

  b. In what setting the data will be collected

  c. When and where each type of data will be collected

  d. For how long

- Have you developed an "informed consent" letter that requests permission to use information about study participants, discusses any potential risks to participants, and assures them confidentiality?

- Is your plan for data analysis fully described, including how you will approach your analysis and at what points you will analyze your data?

- Have you identified literature about your question (reference list) that will inform your study?

- Do you have a time line for conducting the study? It should include:

  a. Data collection

  b. Data analysis

  c. Review of literature

  d. Writing a first draft of your findings/conclusion

  e. Revising for the final draft

- Does your research design make sense? Is it credible? Is it plausible?

- What information might still be needed to know?

- How can this plan be enriched or strengthened?

Exercise 6: Planning for a group study with children—clarifying purposes

- What commonalities can you identify among the various questions the children have raised? How can you craft these into an overarching theme that can organize and guide a group study?

- What concepts and content knowledge will this study help students explore, assimilate, and learn how to apply?

- What skills will children acquire or practice during the course of this study?

- What dispositions—attitudes and ways of learning and relating with others—will this study provide opportunities to develop?

Exercise 7: Planning for a group study with children—orchestrating the learning

- What experiences, activities, projects, and experiments will help your students examine the concepts, learn the skills, and develop the dispositions that you intend to nurture?

- How can these learning experiences be sequenced to capitalize on what you know about your students' interests and their current level of skills?

- What kind of activities will be a part of your plan that will utilize many different learning modalities for the diverse learners in your class?

- What out-of-school activities can enrich the learning of the study?

- What cross-grade/age experiences might support the study?

- What activity that is of service to others might be incorporated into this study?

- How can parents/families be involved?

- What homework assignments can support the study?

- What resources—books, materials, technology, etc.—will you need to support the work of this study?

Exercise 8: Planning for a group study with children—reviewing your plans in relation to standards

Use the following grid to review how the plan for your group study addresses required disciplinary content and standards.

Activity	Language arts	Math	Social studies	Science	The arts	Physical education
Activity 1						
Activity 2						
Activity 3						
Activity 4						
Activity 5						
Activity 6						
Activity 7						
Activity 8						
Activity 9						
Activity 10						

- Is there any discipline area or standard that you have not included in your plans?
- If so, are there ways to address what is missing?

Exercise 9: Planning for a group study with children—assessing students' progress

- What ways have you developed to learn about how children's ideas, understandings, and skills are progressing throughout the course of your study?

- How can you use this information to shape your instruction?

- What culminating experience can you develop for the study?

Exercise 10: Personal agendas for children's individual inquiries

Personal Agenda for _____

My inquiry is about: _____

_____

_____

_____

These are the tasks I need to do for my inquiry:

1.

2.

3.

4.

Exercise 11: Planning logs for children's individual inquiries

Planning Log for _____

Date	Tasks that I worked on