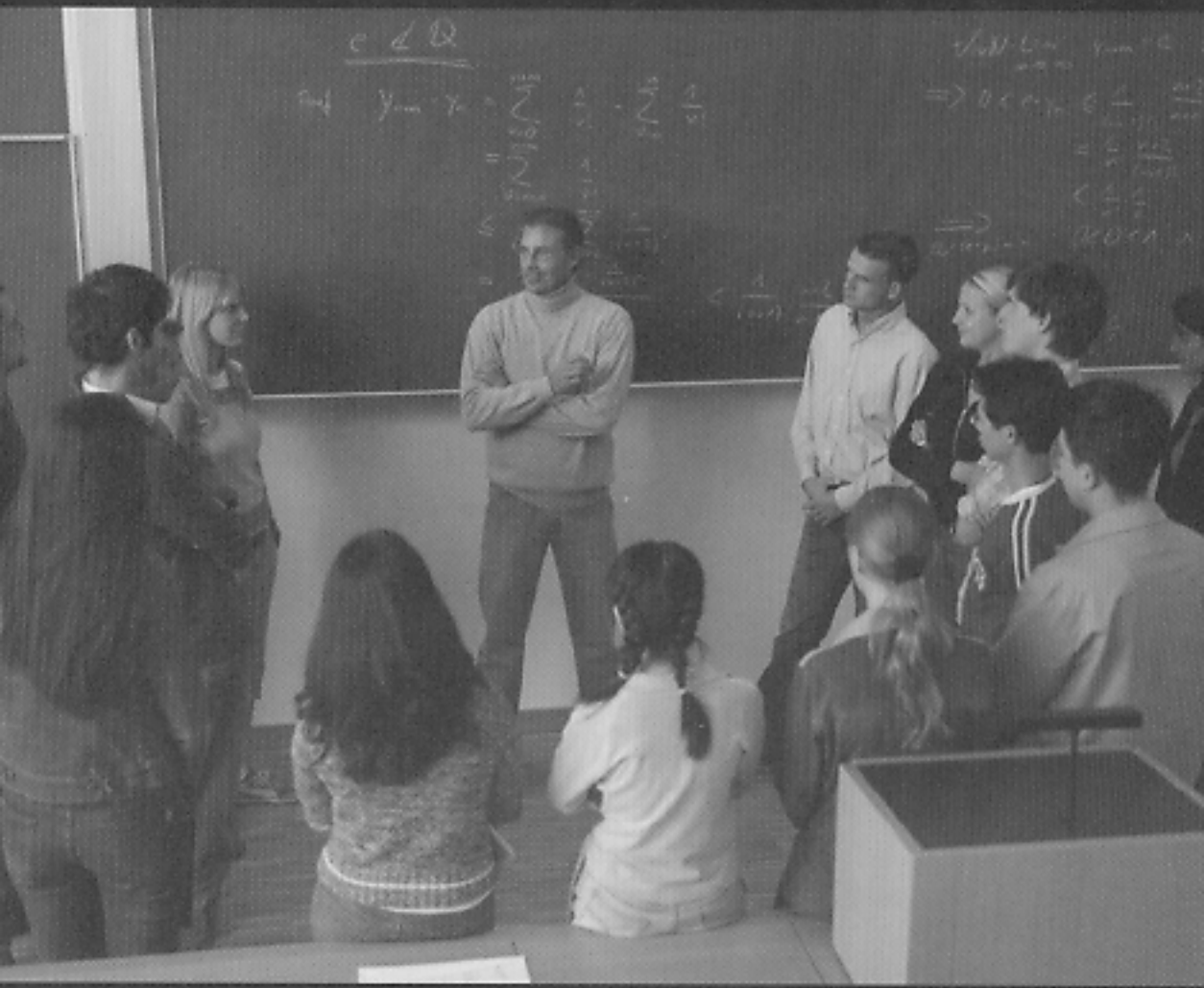
Improving Schools THROUGH Action Research

A COMPREHENSIVE GUIDE FOR EDUCATORS



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CHAPTER FIVE

STRATEGIES FOR COLLECTING DATA

CHAPTER GOALS

- Explain how collecting multiple forms of data increases credibility in action research studies.
- Describe various types of data—artifacts, observational, and inquiry—that can be collected to answer research questions.
- Illustrate ways to align data collection strategies with primary and secondary research questions.
- Demonstrate the ways in which baseline data can be used in action research studies.
- Provide activities to guide practitioners through the process of choosing data collection strategies that are aligned with the focus of their studies.

Before implementing the research plan developed in Chapter 4, you must decide on the data collection strategies you will use in your action research study. This process involves determining the types of data that must be collected to lead to meaningful, accurate, and appropriate conclusions regarding research questions. Also, multiple data collection strategies must be employed to establish the credibility of research findings. In this chapter, information is provided on ways to increase the credibility of your study through the collection of multiple forms of data and ways to align data collection with research questions. Numerous data collection strategies—organized in this text as artifacts, observational data, and inquiry data—are also included. The activities in this chapter are provided to help you choose the best data collection strategies for your study.

COLLECTING MULTIPLE FORMS OF DATA TO ESTABLISH CREDIBILITY AND VALIDITY

When planning ways to collect data to answer research question, a researcher must consider how to best ensure that the findings of study are credible and valid. Credibility can be es-

tablished through **triangulation**, a process in which multiple forms of data are collected and analyzed. As David Clancy (2001) explains, looking at multiple forms of data when answering research questions helps the researcher fill in any gaps that occur if only one data source were used. Elliot Eisner (1991), who utilizes the terms *structural corroboration* when describing triangulation, explains that the purpose of triangulation is to ". . . look for recurrent behaviors or actions, like those theme-like features of a situation that inspire confidence that the events interpreted and appraised are not aberrant or exceptional, but rather characteristic of the situation" (p. 110).

To illustrate the importance of triangulation, consider an action research study conducted by a high school science teacher on increasing academic achievement in a college preparatory biology class by having students work in collaborative study groups. If the teacher reported that the use of collaborative groups was successful based on the fact that some students had higher test scores after participating in the groups than they did before participating in the groups, you would be wise to question the credibility of this finding. There are a multitude of reasons why test scores might have increased (for example, the unit studied during the intervention might have been easier or more interesting than previous units). If the teacher had collected multiple forms of data that all pointed to higher achievement during the collaborative groups intervention, then credibility of the findings would be increased. In this particular example, the teacher could have looked at many forms of student work in addition to test scores, and she could have observed the collaborative groups as they worked together. She might also have interviewed or surveyed students about their perceptions of the strengths and weaknesses of learning in collaborative groups. Analysis of various student work products (tests, papers, projects, etc.), observational notes, and interview or survey data would help the teacher determine the reasons the intervention was successful.

Consider the credibility of the results of the study if triangulation had been used and these were the findings:

- *Students' grades* increased, on average, by 7 points, and students with the lowest averages prior to the collaborative group intervention made the greatest gains.
- *Observations* of students indicated that peers were able to help each other understand difficult concepts, students asked more questions about unit content during the collaborative group work and during class lectures, and students were more interested and involved in learning during the unit than they had been when studying previous units.
- *Interviews* revealed that students felt like they were able to learn from their peers more easily than learning from the book or listening to a lecture, students spent more time preparing for class so they would be able to participate in their collaborative groups, and students studied for the unit test with their collaborative group outside of class.

Considering the results of these varied data collection strategies helps us feel pretty confident that the collaborative group intervention was successful and did indeed lead to higher

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Triangulation: A method in which multiple forms of data are collected and compared to enhance the validity and credibility of a research study.

academic achievement for the participating students. Also, the observations and interviews help us understand why the intervention succeeded.

As you begin to think about ways to establish credibility in your own study, remember that it is imperative that you collect multiple forms of data to answer your research questions. You have probably inferred that triangulation involves having three data sources. In your own study, you may decide to collect more than three kinds of data, which is fine. The number of data collection strategies you will use will depend on the nature of your research question(s) and the number of research questions you are investigating. The more sources of data you have, the more likely it is that your findings will be credible. Keep in mind, however, that you don't want to collect too much data. Meaningful analysis of your data sources will take time, and if you have collected too many different types of data, you may have difficulty making sense of them.

Remember, too, that collecting multiple forms of data can help you answer the *why* questions in your study, which is an important part of any action research project. Look back at the collaborative groups study mentioned previously. Examining student work products helped the teacher conclude that the intervention was successful, but analysis of observational notes and the interviews were crucial for understanding why it was successful. In your own study, you may try an intervention that turns out to be unsuccessful. If this happens, looking at your varied data sources will help you figure out the reasons the intervention did not work, which is critical for ongoing reflective planning. Collecting multiple forms of data and triangulating them will help increase the credibility of your findings, and this will ultimately impact the validity of your study, which will be discussed in greater detail in Chapter 6.

METHODS OF DATA COLLECTION: ARTIFACTS, OBSERVATIONAL DATA, AND INQUIRY DATA

In this section three categories of data will be described: artifacts, observational data, and inquiry data. Artifacts include various types of student work and other items created by participants. There are many forms of observational data, including field notes, checklists, and photographs. Inquiry data are collected to elicit opinions, attitudes, and other types of feedback from participants. Surveys, questionnaires, interviews, and focus groups are typically used for collecting inquiry data. Table 5.1 includes the various forms of data collection strategies that will be described in this chapter for the three data types.

Artifacts

There are a variety of ways to use artifacts to answer research questions. Many action research studies conducted by teachers focus on increasing student achievement. If your study focuses on student achievement, you will want to choose student-generated artifacts, such as assignments, projects, tests scores, or other types of work, as a data source in your study. If you are an administrator and have decided to focus your study on teachers rather than students (for example, investigating the effectiveness of a new teacher mentoring program), there may be teacher-generated artifacts that would be useful sources of data in your study. These include lesson plans, teacher journals, and self-assessments. A third type of ar-

TABLE 5.1 Data Collection Strategies

ARTIFACTS	OBSERVATIONAL DATA	INQUIRY DATA
Student-generated: • teacher-made tests • standardized tests • written assignments • performances • artwork • projects • journals • self-assessment • peer review *Teacher-generated:* • lesson plans • journals • self-assessment • peer review *Archived:* • computer-generated reports • school records • documents	• field notes/observational records • logs • narratives • checklists • tally sheets • videotapes • photographs • audiotapes • organizational charts/maps • behavioral scales	• interviews • focus groups • conferencing • surveys/questionnaires • attitude scales

tifact—archived sources—may be useful if you wish to use school records in your study. A variety of archived information, such as computer-generated reports, attendance and discipline records, or standardized test scores, can be valuable data sources.

Student-Generated Artifacts. There are many types of artifacts that can be used to measure students' attainment of learning objectives or students' progress toward nonacademic goals. Some artifacts can be used for formative assessment, which occurs during the instructional process to monitor the effectiveness of instruction or intervention. **Formative assessment** artifacts include *quizzes* and other written assignments such as *short papers* or *essays, homework,* and *worksheets.* Utilizing these formative assessments can help determine the effectiveness of an intervention continuously throughout the study. This is beneficial in two ways. First, if formative assessments reveal that the intervention is not working, reflective planning can occur during the study the intervention can be altered as necessary. Second, collecting various types of formative assessments provides an opportunity to see changes—in student learning or professional development, for example—over time. **Summative assessment** is used to measure instructional outcomes at the conclusion

Formative Assessment: A method of ongoing assessment used to determine whether progress is being made toward goals.

Summative Assessment: A method of assessment used at the conclusion of instruction or intervention to determine whether goals have been met.

of an intervention or intervention unit. Artifacts used in summative assessment include *projects, performances, papers,* and *teacher-made tests. Standardized tests,* which can also be considered a type of summative assessment, are not often used in action research studies, but they can be used if appropriate for the purpose of the study (for example, in a schoolwide study that involves utilizing a writing intervention for the purpose of increasing scores on the writing section of a standardized test).

Student *artwork* and student *performances* are often used in studies that take place in art, music, or physical education classes. For example, a band director interested in increasing his percussion students' ability to read music would use student performances as a measure of the effectiveness of his intervention strategy. Artwork can be used to measure both the acquiring of skill (understanding use of light and dimension in an art class) and changes in affective behavior such as how a student feels about him or herself. To illustrate this latter use of artwork, consider the example provided in Figure 5.1, which shows two pictures drawn by a first-grade student when he was asked to draw himself at school. In the first picture, which was drawn just prior to the action research study, the child drew his school and drew himself outside the school building. After an intense intervention aimed at helping this child succeed in school, he again was asked to draw himself at school. In the second picture, the boy has drawn himself smiling and inside the school building.

Other forms of student-generated data include student journals, self-assessments, and peer review. Student *journals* can be used for more than just recording feelings and emotions. Students can use journals to record learning struggles, successes, or personal accounts of growth and learning. When using student journals in a study, the first step is to think about the kind of information that the journals can provide. Students often need specific guidelines or prompts for journal writing, which can increase the chances that information in the journals will be useful. Here is an example: Consider an action research study that focuses on increasing writing achievement in a fifth-grade class. The teacher has decided to

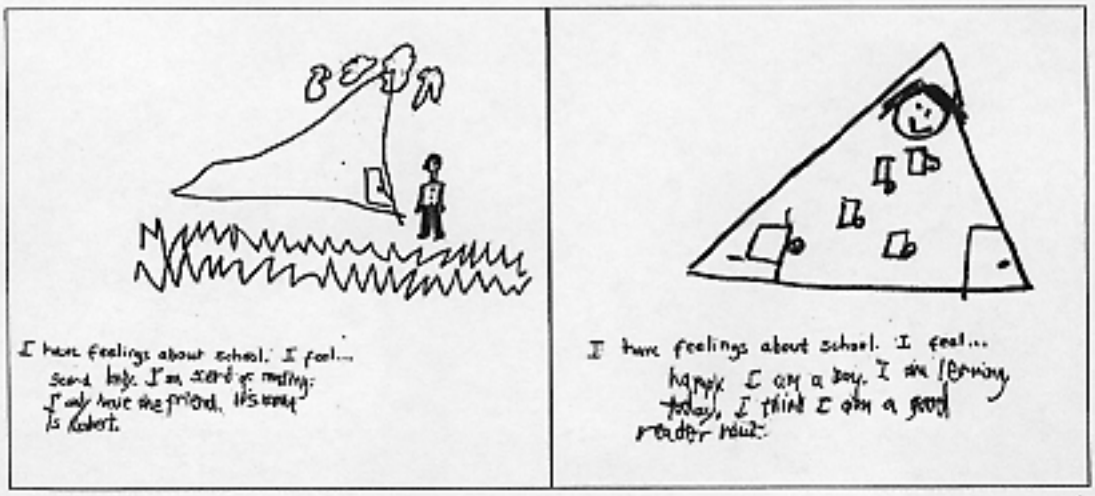

FIGURE 5.1 Student artwork example.

utilize student journals for two purposes. First, the teacher will provide journal prompts to gather information about student perceptions of the writing intervention being used. Second, responses in the journals will be analyzed to determine whether writing achievement has improved. Some of the journal prompts used might be

- *The most difficult part of writing for me is*
- *Writer's workshop* [the intervention] *has helped me*
- *I still struggle with these things when I write*
- *Writing makes me feel*

To assess any changes in writing achievement from the journal entries, the teacher would need to use a standard form of assessment, such as a scoring rubric, to evaluate student work. The use of rubrics will be described later in this section.

Self-assessments are completed by students as they evaluate their own work or their progress toward a certain goal, which may be academic, motivational, behavioral, or affective. Self-assessments can be particularly useful as a type of formative assessment because they indicate students' perceptions of their progress toward learning objectives. If self-assessments reveal that students are struggling, the teacher can engage in reflective planning and make changes to the intervention as necessary. When self-assessments are used, the teacher must make clear to students that honesty and accuracy on the self-assessments are critical so that teaching activities can be planned to increase student learning or growth. This will help reduce the incidence of students providing positive, but inaccurate, self-assessments. Figures 5.2 and 5.3 provide examples of self-assessment. Figure 5.2 includes an example of an academic self-assessment.

In Figure 5.3 a behavioral self-assessment is displayed that includes a teacher assessment component. This type of assessment can be very useful for providing feedback to students showing how the teacher's assessment is similar to or different from the stu-

FIGURE 5.2 Academic self-assessment for reading comprehension (7th grade).

Rate your ability to do the following using a 0 to 3 scale. Your honest answers will help me figure out the best ways to teach you. (0 = I have a lot of difficulty; 1 = I am sometimes successful; 2 = I am often successful; 3 = I am always successful)

1. I can identify the main characters in a fictional story. _____
2. I can describe the plot of a fictional story. _____
3. I can use context clues to figure out words I don't know. _____
4. I can make predictions about what will happen in a story. _____
5. I can identify the conflict in a fictional story. _____
6. I can describe the differences between fiction and nonfiction stories. _____
7. I can identify the point of view from which a fictional story is written. _____
8. I can tell whether what I'm reading is a short story, novel, epic, drama, essay, myth, or poem. _____
9. I know what figurative language is. _____
10. I can interpret the meaning of figurative language. _____

FIGURE 5.3 Behavioral self-assessment for Johnny Vincent (Mr. Mathis, 4th grade).

Rate how you did in class today following the classroom behavioral objectives. Use this scale:

A = GREAT! B = Pretty Good; C = Could Use Some Work;
D = Could Use a Lot of Work; F = TERRIBLE!

STUDENT ASSESSMENT	BEHAVIOR	TEACHER ASSESSMENT
A B C D F	I stayed in my seat.	A B C D F
A B C D F	I raised my hand to speak.	A B C D F
A B C D F	I completed my work.	A B C D F
A B C D F	I paid attention to the lesson.	A B C D F
A B C D F	I did not disturb my classmates.	A B C D F

dent's assessment. It also allows the teacher to keep track of differences in student and teacher perceptions of assessment.

Peer review involves having a student evaluate the work of another student, which gives students an opportunity to provide and receive feedback from peers on their work or progress. Airasian (2000) explains that this process allows students not only to get feedback from their peers, but to also see another student's work, which serves as a model for comparison. Peer review can be especially useful when students are allowed to revise their work based on the feedback they get from peers. When peer review is used, standard criteria for assessment in the form of a scoring rubric should be used. Often, the same scoring rubric used by the teacher to grade students' work can be used in the peer review process.

No matter which types of student artifacts are used in the action research study, steps must be taken to ensure that the artifacts do indeed measure what they are intended to measure. For example, if a teacher-made test will be used as a type of summative evaluation in the study, the test must accurately measures what was taught during the intervention. So if a study focused on teaching students multiplication facts (2×9, 3×4, etc.), measuring their knowledge of multiplication facts using a word problem test (*Farmer John has three rows of corn with four seeds planted in each row. How many stalks of corn can he expect if all the seeds grow?*) would not accurately measure whether students know multiplication facts. Scrutinize your assessment methods to ensure that they are aligned with instruction. Ask collaborators or peers to look at your assessment methods and help you determine whether the methods measure what you want them to measure.

Also keep in mind that your assessment of student artifacts must somehow be standardized. Simply stated, this means that all work is assessed in the same way. For work that is considered subjective in nature, such as essays, papers, projects, performances, or artwork, steps will need to be taken to ensure that students are assessed in a standard way. The most efficient way to do this is to create a **scoring rubric**. Airasian (2000) defines a rubric as

Scoring Rubric: A guideline for measuring whether objectives have been met based on predetermined performance criteria.

> . . . a set of clear expectations or criteria used to help teachers and students focus on what is valued in a subject, topic, or activity. Scoring rubrics are brief written descriptions of different levels of pupil performance based on the performance criteria. Rubrics can be used to score both performances and products. They are constructed by combining performance criteria into different levels of performance and ordering them in descriptive terms. (p. 166)

Thus, in creating a scoring rubric, the criteria by which students will be assessed must be determined, and then a decision must be made regarding how different levels of performance on these criteria will translate into an evaluation, score, or grade. If you will be creating a scoring rubric for your own study, there are several books on creating scoring rubrics that may be helpful to you, including:

- Airasian, P. W. (2000). *Assessment in the classroom: A concise approach* (2nd ed.). Boston: McGraw Hill.
- Arter, J., & McTighe, J. (2001) *Scoring rubrics in the classroom: Using performance criteria for assessing and improving student performance.* Thousand Oaks, CA: Corwin Press.
- Marzano, J. (2000). *Transforming classroom grading.* Alexandria, VA: Association for Supervision and Curriculum Development.
- Marzano, R. J., Pickering, D., & McTighe, J. (1993). *Assessing student outcomes: Performance assessment using the dimensions of learning model.* Alexandria, VA: Association for Supervision and Curriculum Development.

Also, there are some very useful websites for teachers who wish to create scoring rubrics, such as:

- *Kathy Schrock's Guide for Educators—Assessment Rubrics* (Available at: http://school.discovery.com/schrockguide/assess.html)
- *Designing Scoring Rubrics for Your Classroom* by Craig A. Mertler (Available at: http://ericae.net/pare/getvn.asp?v=7&n=25)
- *Rubrics: Scoring Guidelines for Performance Assessment* by Adele Fiderer (Available at: http://teacher.scholastic.com/professional/profdev/summerbookclubs/grade46/)

You may wish to conduct your own Internet searches using the keywords *rubric, scoring rubric,* or *grading rubric.* Two examples of scoring rubrics are provided in Figures 5.4 and 5.5. Figure 5.4 is a mathematics scoring rubric and Figure 5.5 is a public speaking performance scoring rubric.

Teacher-Generated Artifacts. Many of the student-generated artifacts described previously are similar to the types of teacher-generated artifacts that can be used in a study in which teachers rather than students are the study participants. Journals kept by teachers are a good source of data, and they can be used to evaluate both affective and behavioral information. For example, if a principal or staff development specialist were interested in studying the effect of a mentoring program for first-year teachers, she might ask first-year teachers to keep a daily or weekly journal about meetings with mentors. As described in the

FIGURE 5.4 Math scoring rubric (Mr. Compton, 8th grade algebra).

SOLVING LINEAR EQUATIONS AND INEQUALITIES IN ONE VARIABLE.				
	Advanced (4)	*Proficient (3)*	*Basic (2)*	*Emerging (1)*
Solution	Student demonstrates a thorough understanding of the concepts and provides correct solutions for all problems.	Student demonstrates good understanding of concepts and provides correct solutions at least 80 percent of the time.	Incorrect solution provided, but student demonstrates some understanding of concepts.	Student provides incorrect solution.
Procedure	Student uses correct procedures at all times.	Student uses correct procedures at least 80 percent of the time.	Student always or often uses incorrect procedures but demonstrates some understanding of how to use procedures.	Student uses incorrect procedures in an attempt to solve the problem.
Explanation of Solution	Explanation of solutions are correct and are provided for all problems.	Explanation of solutions are correct at least 80 percent of the time.	Explanations of solution are incorrect, but student can explain some procedures correctly.	Explanation of solutions are incorrect.

FIGURE 5.5 Public speaking performance rubric.

	Excellent (4)	*Good (3)*	*Adequate (2)*	*Poor (1)*
Clarity	Speaker clearly enunciates all words.	Speaker clearly enunciates most words.	Speaker enunciates some words.	Speaker does not enunciate.
Eye Contact	Speaker maintains eye contact with audience.	Speaker often makes eye contact with audience.	Speaker makes little eye contact with audience.	Speaker does not make eye contact with audience.
Grammar	Speaker makes no grammatical errors.	Speaker makes few grammatical errors.	Speaker makes some grammatical errors.	Speaker makes numerous grammatical errors.
Information	Speech includes many facts related to topic.	Speech includes some facts related to topic.	Speaker includes few facts related to topic.	Speaker includes no facts related to topic.
Volume	Speaker maintains appropriate volume level throughout speech.	Speaker uses appropriate volume level during most of the speech.	Speaker uses an uneven volume throughout the speech.	Speaker uses an inappropriate volume level throughout the speech speech.

previous section, journal prompts could be used to ensure that certain types of needed information are included in the journal. Prompts might include

- *The most useful information my mentor has shared with me was*
- *I wish my mentor would help me with*
- *My mentor has helped me with classroom management by*
- *My mentor has helped me with my instruction by*

Self-assessment and peer-review are other sources of teacher-generated artifacts. *Self-assessment* can be used to gather teachers' perceptions of their strengths and weaknesses, their understanding of state mandates, or their content knowledge. An example of a teacher self-assessment is provided in Figure 5.6. It should be noted that with self-report data such as this, respondents may provide answers that they think are expected of them or are socially desirable, rather than provide an honest and accurate self-assessment. With all types of self-assessments, it is imperative to explain to the respondents that honest responses are desired. Other methods, such as allowing respondents to remain anonymous or informing respondents that there are no risks in providing honest responses (and following through on this policy) may increase the likelihood that responses are honest.

Peer review as a teacher-generated artifact can be used to allow teachers to receive feedback from colleagues on various aspects of their teaching, which could include topics such as teaching effectiveness, participation in curriculum planning, communicating with parents, and classroom management. The self-assessment for first-year teachers provided in Figure 5.6 could also be used for peer review. For example, a mentor teacher or administrator could use the assessment to determine areas in which the new teacher needed mentoring.

Lesson plans are another type of teacher-generated artifact that can be useful in action research studies. For example, in an action research study that focused on training teachers to use a new method for teaching reading comprehension, the researcher would be interested in determining whether teachers were utilizing their training and using the new method during instruction. Evaluating lesson plans is one way the researcher can look for evidence that teachers are indeed incorporating the new reading comprehension strategy instruction into their lessons.

Archived Artifacts. Archived artifacts, such as computer-generated reports, school records, and school documents can be useful sources of data in some action research studies, particularly those studies that are conducted at the school level. For example, a media specialist I recently worked with utilized *computer-generated reports* in an action research study she conducted on the use of the Accelerated Reader program at her school. In working with teachers, she observed that some teachers were not implementing the program—which assesses a student's reading level, allows the student to choose books to read on that level, and then assesses the student's success on a reading comprehension test—effectively or with much enthusiasm. The purpose of the media specialist's study was to train the teachers in the effective use of Accelerated Reader with the hope of getting them to buy into the program. One aspect of the Accelerated Reader program is that it generates computer reports for students and classes regarding each student's reading level and his or her rate of success on the reading comprehension tests. The media specialist was able to use these

FIGURE 5.6 Teacher self-assessment for first-year teachers at Griffin High School.

This self-assessment will be used to determine areas for mentoring during this school year. Our ability to provide the best and most useful mentoring for you relies on your honesty and candor as you complete this assessment.

Please rate your abilities in each of the following areas using the scale:
1 = I need a lot of help in this area
2 = I am making progress in this area, but I need some help
3 = I do not need help in this area

Also list your strengths and weaknesses in each area.

1. Classroom management 1 2 3

Strengths:

Weaknesses:

2. Use of class time 1 2 3

Strengths:

Weaknesses:

3. Lesson planning 1 2 3

Strengths:

Weaknesses:

4. Understanding the content I teach 1 2 3

Strengths:

Weaknesses:

5. Working with students who have special needs 1 2 3

Strengths:

Weaknesses:

6. Understanding school procedures 1 2 3

Strengths:

Weaknesses:

computer-generated reports to determine whether training the teachers to use Accelerated Reader had an effect on students' reading levels and reading comprehension. If you are utilizing software or computer program in your study, the software may generate reports on student progress that can be useful in your study.

School records are another source of archived data that may be useful in an action research study. School records can provide information on attendance, disciplinary actions, retention rates, or standardized achievement scores. Finally, *documents* such as PTA bulletins, committee meeting minutes, and school handbooks can be good sources of data, particularly if the action research study involves analyzing perceptions, goals, school culture, or procedures. For example, analyzing PTA bulletins can reveal issues that teachers and

parents see as important. Analysis of the school handbook can reveal information on the culture, climate, and rules in a school. Studying committee meeting minutes can indicate how time is spent during meetings, what issues are seen by teachers and administrators as important, and how much progress is made toward achieving goals over time.

Observational Data

Observational data are the most important source of information in an action research study. Whereas artifacts can help decide whether an intervention has had an impact (for example, evaluating student work to look for gains in achievement), observational data can help determine why an intervention was successful or unsuccessful and how the context of the setting impacted the study. To illustrate, consider an action research study conducted by a principal on the use of teacher study groups to improve school climate. The principal could interview or survey teachers to determine whether school climate improved as a result of the intervention, but just knowing whether there was an improvement would greatly limit the credibility of the study. Observations of teachers as they worked in the study groups could reveal teacher attitudes and perceptions about the issues related to school climate. Continuing to observe the study groups throughout the study would allow the principal to see how attitudes and perceptions change over time, and the ongoing observations could provide the principal with the opportunity to understand how the complex issues dealt with by teachers interact to impact school climate. The deeper level of understanding that comes with good observational data collection leads to effective and ongoing reflective planning.

As you determine the best ways to use observation in your own action research study, you must consider how observational data will be used to inform your action research study, what it is you want to observe, who you want to observe, and what role you wish to play in the observation. First, how will observational data be used in your study? Is the purpose to evaluate how the intervention is working or how participant behavior is affected by the intervention? Deciding on the purpose of your observation will help you establish what it is that you want to observe. Good questions to ask yourself at this stage are:

- *How will observations help me answer my primary research question?*
- *How will observations help me answer my secondary research questions?*
- *What type of observations can best help me understand how the context of my setting affects the success of my intervention?*

Once you know what you want to observe, you must also determine who you want to observe. If you are conducting a study with a large group of students, it may not be possible to observe each participant. If this is the case in your study, how will you choose who you observe? Will you focus on those students who have struggled the most in the past? Will you choose only the high achievers? Will you randomly select a small number of individuals to observe? Will you systematically choose so that you are able to observe different types of participants? Will you simply make general observations of the setting? Once again, the best rule here is to focus on the purpose of your study and on your primary

and secondary research questions. In order for you to answer your questions, who must be observed in your study?

Finally, you must consider the role you wish to play in observation. If you are a teacher studying your classroom, you will be a participant-observer. As a teacher, you cannot simply sit back and watch what goes on in your classroom. Even if you are observing students as they work in collaborative groups, you will still be teacher and facilitator—a participant in the classroom environment. In other types of action research studies, it is possible to be an observer without having to participate in the action. For example, a principal or administrator could observe a teacher study group without actually being a part of that group (though the nonparticipant status could change if the teachers attempted to bring the administrator into the discussion).

Although it is difficult to be anything but a participant observer in educational action research, the observer can engage in different levels of observation. For example, if it is critical to the purpose of your study that you engage in ongoing observation during your study, you will probably choose to make notes throughout the study, even during the intervention. If, instead, it is critical for you to stay focused on the intervention, it may be necessary to video- and/or audiotape during your study so that you can concentrate on teaching during the intervention and make observations from the videotape later. Finally, if it is important in your study to have some type of nonparticipant observation in order to get a different perspective of what is occurring during your study, you may wish to ask a colleague or collaborator to make some observations of your research setting. Comparing your observations with another colleague's observations is a method of peer debriefing, and it can be very useful for checking biases and getting a second opinion about what the observations indicate.

One method of collecting observational data is through *observational records* or *field notes.* Field notes are kept throughout the study and include detailed information about implementation of the intervention, participant responses, and surprising events. Field notes are best kept in a journal, and they should be entered each day of the study or each day the intervention takes place. Because you are both a participant **and** observer in your study it can be quite difficult to record detailed information as you are teaching or facilitating. It is more reasonable to jot brief notes as significant or noteworthy events occur, but it is critical that more detailed notes are made as soon as possible. Establish a time each day—during planning time, during lunch, or at the end of the day—to expand the notes made earlier. Remember, too, that it is not necessary to write down each and every event that occurred. Focus on making notes that are relevant to the study.

When you observe something that seems to be vital for describing or understanding aspects of your study, you may wish to write a *narrative* account of the event. A narrative is simply a detailed description of an event that is used to portray detailed contextual information. Consider this example: A fourth-grade teacher focused his action research study on a severely withdrawn and socially shy child whose withdrawal from peers was negatively affecting his classroom participation, acceptance by peers, and academic achievement. Here is the teacher's narrative account of Juan's activities after fourteen weeks of intervention:

Juan raised his hand, and when I called on him, he quietly asked me if he could work with Rita to complete his math sheet. Over the past three weeks, Juan has been requesting to work with Rita on some math assignments, particularly the ones he struggles with. Rita is a good math student but is quiet and reserved much like Juan, though she does participate in class and she has many friends. Each time Juan has worked with Rita, he has gone to her desk, watched her complete some math problems, and waited for her to say the first word. Usually Rita will ask Juan a question such as, "Which one are you stuck on?" or "What problem are you working on now?" Juan then points to the problem or quietly says the number of the problem. Of the several times Juan has worked with Rita, he has rarely said a word to her. Instead, he watches how she completes a problem, listens to her explanation, and then tries a problem himself as Rita shows him how to do it. Today, though, Juan went to Rita's desk and very quietly said, "I don't know how to do this problem [long division, worksheet 5.1, question 4]. I keep getting stuck here [what to do with the remainder]." Rita showed him how to work the problem and then asked him if he understood. This is the first time she has asked him a question like that. It appears that she took her cue from Juan. Because he was more vocal today—initiating a conversation—she was, too. Juan responded, "I think so," and then attempted to complete the next problem on his own. Rita watched without saying a word, and when he was done and had successfully calculated the answer, she looked at Juan, smiled, and said, "That's right! You did that really fast." This was the first time she had encouraged Juan in that way. Juan, who rarely looks his peers or me in the eye, looked at Rita, smiled, and said quietly, "Thanks." He then went back to his seat and completed his assignment. When he was done, which was much sooner than the majority of his classmates, Juan raised his hand. When I called on him, he came to my desk and showed me his paper, though students were not required or even asked to do this. I asked Juan if he wanted me to grade his paper then, and he nodded yes. I scored his paper and he missed only one problem, which was one of the most difficult. I showed Juan which answer was incorrect and he said, "What did I do wrong?" I showed him his mistake and explained how to fix it. Juan then went back to his desk with his paper, fixed his mistake, and then sat quietly. Marcus then came to my desk and said he didn't understand what to do. I asked Rita, Juan, and Melinda if any of them would be willing to help Marcus since they were already finished with their assignments. Even Juan said yes. Marcus chose to work with Rita, but when Samantha asked for help and I told her she could work with Juan or Melinda, she chose to work with Juan. Though he seemed a bit reluctant at first, Juan patiently showed Melinda how to work one of the problems. He spoke very quietly and at one point Melinda said she couldn't hear him. Juan spoke a bit louder then and continued to explain how to do the problem. After several minutes, Melinda said, "Oh! I get it!" She thanked Juan and sat down to complete her assignment. When I asked for volunteers to try some new problems on the board, Juan kept his head down, which is his usual behavior. However, he was attentive as his peers completed their work on the board, and he raised his hand to help Marcus when he was stuck on his problem.

This narrative was written from brief field notes (see Figure 5.8) jotted by a teacher during his action research study. Because it is difficult, if not impossible, to write detailed narratives during an observation, it is necessary to expand field notes soon after the observation to ensure that important details are remembered. Narratives such as these can provide much insight in certain action research studies. In the study focusing on Juan, the narrative account expresses the nuances of Juan's behavior that help us understand exactly how he is changing as a result of the teacher's intervention. The narrative is much more use-

ful in understanding Juan as a person and in understanding the change in his behavior than a brief description such as, "Juan now works well with other children, asks questions in class, and has improved his grades from Ds and Fs to As and Bs." Keep in mind that writing numerous narrative accounts can be a time-consuming enterprise, so carefully choose the events that you wish to explain through a narrative.

Field notes and narratives are a great way to collect detailed information. However, it may be useful to make less detailed observations, in which case logs, checklists, and tally sheets can be utilized. A *log* is a running record of activities that is used to record events at specified intervals. To keep a log, you must first determine how often you will record events. For example, if you decide to record information every ten minutes, you must carefully observe the time and then each ten minutes write down what is occurring. A log is an effective way of keeping track of activities, but is not always useful to keep track of participant behaviors. Significant behaviors can happen at any time, not just every ten minutes. Figure 5.7 provides an example of a teachers' log.

FIGURE 5.7 Teaching log for Jurdell Jackson, Honors Biology, Period 2, 10/15/2003.

TIME	EVENTS
0900	Began class with focusing exercise on the amoeba. Assignment was on board: Draw and label all parts of an amoeba.
0910	Discussed collaborative assignment for today: In assigned groups of 5, students design a new single-cell life form.
0920	Students working in groups : reading assignment sheet, asking for clarification, making notes
0930	Students working in groups: Group 1: Students silently reading/skimming textbook Chapter 7. Group 2: Students engaged in debate about food source: Group 3: Group leader has assigned separate tasks to each group member. Group 4: Students discussing shape of their organism. Group 5: Students independently working quietly on sketches and ideas.
0940	Students working in groups: G1: Discussing all necessary elements to describe for project. G2: Discussing reproduction. G3: Still working on separate tasks; G4: Sketching life form. G5: Group members sharing sketches and ideas.
0950	Break for whole class question/answers.
1000	Each group completes progress sheet to turn in.
1010	Dismissal.

Logs can also be kept to record behaviors. Behavior logs are especially well-suited for studies that focus on increasing appropriate student behaviors. The log can serve as a running record of inappropriate behaviors and when the behaviors occur. For this type of log, behaviors are written down as they occur, and the time of occurrence is noted with each behavior. Behavior logs can also be used to simply record any type of observed behavior, which is illustrated in Figure 5.8. This log was later expanded into a narrative, which was presented previously.

Checklists and tally sheets are used to track types of behavior or events and their frequency. On a *checklist*, the researcher keeps track of behaviors that are exhibited or events that occur. A *tally sheet* is used to keep up with the number of times a behavior is exhibited. Both checklists and tally sheets are used to gather information at a point in time such as during a class period, at lunch or recess, during a group activity, or during a performance. Checklists and tally sheets can be combined, as can be seen in Figure 5.9.

Figure 5.10 includes an example of a checklist that could be used to monitor activities during collaborative work. An effective and useful checklist should include those behaviors that are deemed to be important in relation to the intervention or the desired effects of the intervention. Thus, in the example in Figure 5.10, the teacher has listed the desirable traits of effective collaboration (the intervention), and he uses the checklist to monitor which groups exhibit those traits. Analysis of the checklists and other forms of data that may be collected (student work, field notes, surveys) will help the teacher determine the traits that are necessary for collaborative group work to be most effective.

FIGURE 5.8 Behavioral log for Juan R., 4th grade, Mr. Brindle.

DATE	TIME	BEHAVIOR
Oct. 16, 2003	0946	Juan asked to work with Rita (math worksheet 5.1)
	0948	Juan initiated conversation with Rita: "I don't know how to do this problem [5.1, #4]. I keep getting stuck here [Remainder]".
	0950	Rita showed Juan how to work the problem and asked if he understood [new behavior/conversation]. Encouraged Juan. Juan made eye contact, said, "thanks."
	1002	Juan asked me to review his problems [new behavior]—only 1 wrong answer. Juan asked me to explain his mistake.
	1005	Juan offered to help Marcus and Samantha [new behavior]. Juan worked with Samantha. Samantha asked Juan to speak up.
	1018	Juan helped Marcus with problem on board.

FIGURE 5.9 Checklist and tally sheet for persuasive speech.

Student Name: Jonathon Thurman		
Student maintained eye contact:	Yes	No
Student's speech was engaging:	Yes	No
Speech was organized:	Yes	No
Number of times student said "uh" or "um."	✓✓✓✓✓	
Number of times student looked at note cards.	✓✓✓✓	

Figure 5.11 shows an example of a tally sheet used to monitor behaviors. In this example, the teacher is studying the effects of a behavioral intervention for a child with autism who is mainstreamed in a regular fourth-grade classroom. Using tally sheets in a study such as this can help the researcher see how behavior changes over time during and after the intervention process. The tally sheet is different from a behavior log. On a behavior log, behaviors are written down as they happen. On a tally sheet, common behaviors—particularly those that are focused on in the study—are listed on the sheet prior to the observation. Marks are made during the observation time to note how many times, if any, the behavior occurred.

Behavioral scales, like tally sheets, checklists, and behavioral logs, are used to provide an assessment or evaluation of behavior. A behavioral scale is used to determine a general assessment of behavior rather than keep track of the number of times a behavior occurs. A number of behavioral scales have been created to allow teachers, counselors, administrators, and other school staff to provide data that can be analyzed to determine whether a student exhibits signs of attention deficit disorder, hyperactivity, characteristics of autism or Asperger's syndrome, developmental delays, behavioral problems and so on.

Video- and *audiotapes* are not observational methods but are tools for observation. Often, as a participant as well as observer in your study, you will lack the time to make observational notes on the spot. Also, as you teach or facilitate during the intervention phase

FIGURE 5.10 Collaborative groups checklist, Honors Biology, 2nd Period, Mr. Jackson, 10/22/03.

BEHAVIORS/ACTIVITIES	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5
All members actively participate.	✓		✓		✓
Group members are respectful of one another.	✓	✓		✓	✓
Group members attempt to complete work on their own before asking me questions.	✓		✓	✓	
Group stays on task.	✓		✓	✓	
Group completes and turns in progress sheet.	✓	✓	✓		✓

FIGURE 5.11 Tally sheet for Micah R., fourth grade, Mrs. Ellison's class.

Observed Student: Micah R. Date: March 15, 2002 Time: 0830 - 0930

Undesired Behaviors		*Desired Behaviors*	
Tapping pencil:	✓✓✓✓✓	Asking for help with work:	✓✓
Spinning pencil:	✓	Raising hand for attention:	✓
Mumbling:	✓✓✓✓✓✓✓	Responding when spoken to:	✓✓✓
Talking out in class:	✓✓	Following oral directions:	

Notes: Micah responded three times when spoken to (out of seven opportunities). Micah was given oral directions five times during this period, but did not follow directions at any time. Micah was asked three times to stop mumbling, once to stop tapping his pencil, and once to begin his work. He responded once with "OK" when I asked him to stop mumbling, but he did not stop.

of your study, it will not be possible to see and hear everything that is occurring. For these reasons, you might wish to consider videotaping and audiotaping parts of your study. You and your collaborators—as well as a peer reviewer—can make observations from video. Audiotapes are useful, too, but they do not allow the researcher to see what is occurring. Audiotaping can be very helpful, though, particularly if the intervention involves collaboration on the part of participants. A principal investigating teacher study groups or a teacher studying the effects of collaborative learning cannot observe all groups at once. If each group is audiotaped, however, the principal or teacher can go back and listen to a record of events for each group.

As you determine whether you will use video- and/or audiotape in your study, you need to consider several things. First, it is imperative that you have permission from participants, their parents (if participants are minors), and your school before you video- or audiotape participants; this process will be discussed in further detail in Chapter 6. You also must decide what you will tape and how often you will tape. Keep in mind that you will need to make observational notes from videotapes and transcriptions from audiotapes, and both of these activities are extremely time consuming. For that reason, take time to think about how taping can help you answer your research questions. It is unlikely that you need to tape every event during your entire study in order to get useful information. Come up with a plan for taping that is reasonable and that will provide the kinds of data needed to answer research questions. The last thing you need to consider is choosing taping equipment. Video- and audiotaping can be frustrating, especially when equipment does not work properly. Make sure to do a test run prior to using any taping equipment. If groups of participants will be audiotaping themselves, make sure they practice taping and listening to themselves so they will know how loudly to speak so that the tapes are clear. Finally, clearly mark all tapes with dates, times, and participant information. You should plan to look at videos or listen to audiotapes as soon as you can after taping.

Photographs are another tool for data collection. Though photos do not provide the kind of detailed information that a video can provide, they do offer a point-in-time reference, and they can be very useful when included in a publication or presentation of an action research study. Burns (1999) provides a number of ways photos can be used in action research, including for illustration of the intervention strategy used, for presenting a lasting visual reference of classroom tasks and activities, and for personalizing the participants in the study. Consider the effectiveness of using photographs in the study about Juan, the shy and withdrawn student who was described earlier in a narrative. Including pictures of Juan before the intervention to compare to pictures during and after the intervention could be a very powerful indicator of how Juan's behavior changed over time. Early pictures might show Juan away from others during classroom activities whereas pictures taken during and after the intervention might show Juan working with other students. Pictures such as these, in addition to the narrative and other sources of data, would be powerful evidence of the change in Juan after the intervention phase.

Photographs can also be useful to show what an intervention "looks like" or to provide examples of student work. For example, a teacher studying the use of Reader's Workshop could use a series of pictures to show the different types of activities that are part of the intervention. She could also take pictures of student work or student performances (book reports, students engaged in debate about an issue from a book, oral presentations, dioramas relating to a story) to graphically illustrate the type of work and the quality of work that students provide. Photos used in these ways are very useful when included in publications or presentations of the action research study. Be sure to secure permission from participants (and their parents if they are minors) before using photographs in your study.

Organizational charts or *maps* are used to provide various types of data related to the layout of an environment (the classroom, media center, playground) and the interactions of individuals in that environment. A media specialist, for example, could use a map of the media center to evaluate its layout. To begin, the media specialist would create a floor plan of the media center. Once the floor plan was created, the media specialist would make several observations of students and teachers as they used the media center, making notes on the floor plan. In Figure 5.12, an example of an organizational map is provided.

Inquiry Data

Inquiry data are used to gather information from participants about their knowledge, values, beliefs, past experiences, feelings, opinions, attitudes, or perceptions. In action research studies, inquiry data can provide a researcher with participants' perceptions about the effectiveness of an intervention, ways the intervention could be improved, and feedback regarding positive and negative aspects of the intervention. Consider the example provided at the beginning of this chapter about a biology teacher's study of collaborative study groups. Collecting inquiry data in the form of interviewing students revealed to the teacher the students' attitudes about learning in collaborative study groups. Students expressed that it was easier for them to learn from peers than from the textbook or class lecture. Further, students said that they spent more time preparing for class because they wanted to contribute to their collaborative group. In the interviews, students also explained that they

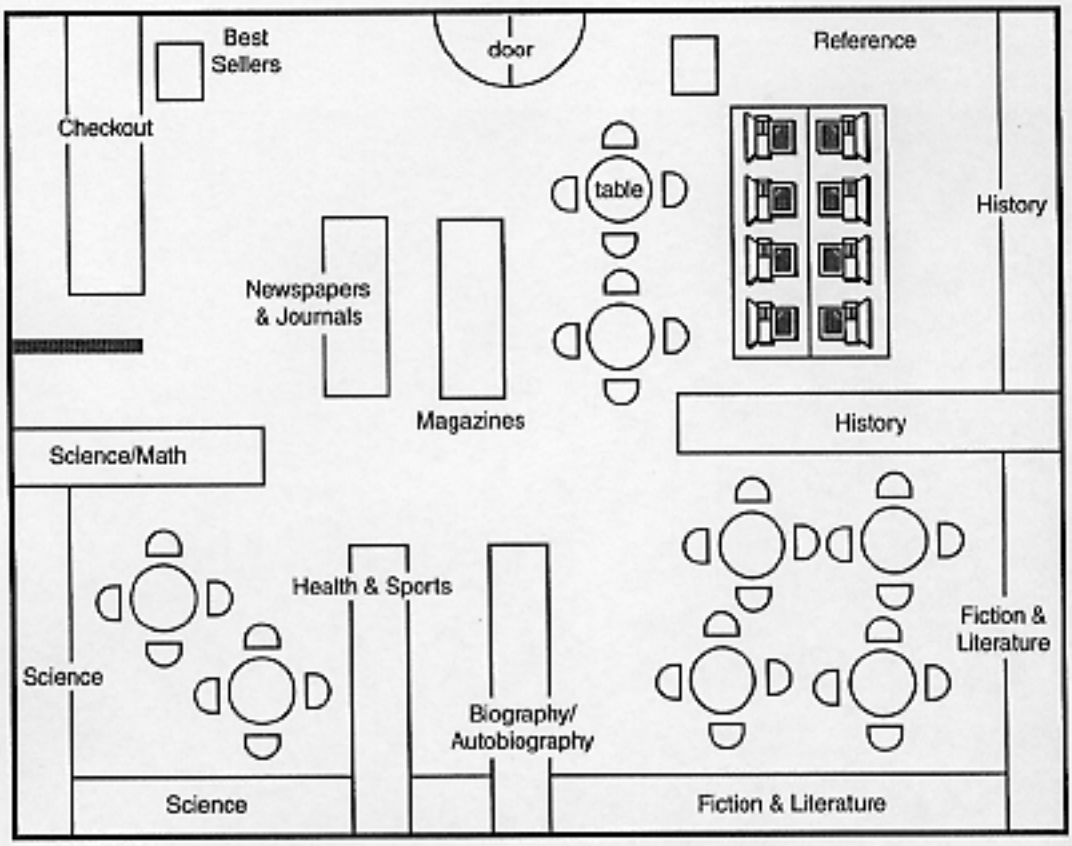

FIGURE 5.12 Media center floor plan for James Madison Middle School.

studied for tests with their collaborative group outside of class, which is something they had not done in the past.

Allowing participants to express their ideas and opinions about various aspects of your study is a good way to add to the richness of your investigation. Inquiry data can help you answer the *why* questions in your study by providing you with your participants' assessment of the effectiveness of the intervention. This leads to a thorough understanding of reasons the intervention was successful (or unsuccessful). Further, analysis of the inquiry data that participants provide is important in the ongoing process of reflective planning.

Inquiry data can be collected verbally in face-to-face meetings with participants through interviewing, holding focus groups, or by conferencing. There are many benefits to collecting these types of verbal data. One benefit is that participants have the opportunity to provide detailed feedback. Another benefit is that the researcher can shift the focus of the inquiry meeting based on participants' comments and the researcher can ask questions as they arise in conversation with participants. Though verbal inquiry data are a rich source of

information, there are negative aspects of collecting this type of data. First, if you wish to interview participants individually, the process of interviewing, transcribing the interviews, and analyzing the interview data can be very time consuming. Also, you must be able to facilitate your meetings with participants so that you maintain some measure of control in the meetings (you don't want it to turn into a free-for-all gripe session) while allowing participants freedom to express what they think is important for you to know. Finally, you must be able to listen to *criticism*—in both ways this term is defined: as a disapproval and as an assessment or analysis—without penalizing, denigrating, or reprimanding the critic. In action research, one of the most difficult aspects of data collection, particularly with inquiry data, is that participants may be reluctant to provide honest responses. Students may find it difficult to tell teachers how they honestly feel about the teacher's instruction or the way the teacher interacts with students. Teachers also may worry about providing their principal or another administrator with honest answers to interview questions. Thus, it is important to make your interviewees feel at ease. You must inform your interview participants that you cannot improve your practices without their honest answers, and you must assure them that there will be no penalty for answering honestly. Though it may be hard for you to receive negative feedback, always keep in mind that any information that participants provide is useful for helping you understand how to improve your practice. If eliciting honest answers is problematic in your particular study, consider having a colleague or collaborator collect inquiry data for you.

Interviewing participants can occur through a structured or unstructured process. In a *structured interview,* the researcher prepares a list of specific questions prior to the interview that guides the process. In an *unstructured interview,* the researcher asks broad questions and then lets the interview proceed on its own course. A *semi-structured interview,* which involves asking some planned questions and then allowing participants to speak about related issues that are important to them, can be very useful in action research. Using a semi-structured interview is a good way to make sure that questions important to the researcher are answered while providing participants with an opportunity to add other useful information.

If you will use interviewing as a method for collecting inquiry data in your study, there are several steps to take in the planning process. First, determine the purpose of the interview. Think about how interview data will help you answer your primary and/or secondary research questions. Second, you must decide who you will interview. If you are a teacher conducting a study in your classroom, you may not be able to interview all students because of the time needed. If, instead, you will interview only some participants, how will you decide who the interviewees will be? Will you choose randomly from the entire class? Will you choose systematically—for example, a few high-achieving, average-achieving, and low-achieving students or a few students who responded well to the intervention and some who responded poorly to the intervention—so that you get multiple perspectives? Be sure to carefully choose interviewees, keeping in mind that various perspectives may be important to help you find meaningful and credible answers to your research questions.

The third consideration in planning your interview is to determine whether you will conduct a structured, unstructured, or semi-structured interview. To help you decide, consider the purpose of interviewing in your study. If, for example, you are a teacher who wishes to elicit students' opinions about a new teaching strategy and their perceptions

about its effectiveness, a semi-structured interview is a good choice. Specific questions, such as *How did working in the collaborative groups affect your learning? Do you prefer learning on your own, listening to class lectures, or working in a collaborative group?* and *In what ways is learning in a collaborative group different than learning in other ways?* could be followed with more open-ended questions such as *Tell me why you think learning in collaborative groups was so helpful to you* (following a participant's response that learning in the groups was helpful) and *How could I make the collaborative groups better?* Throughout the semi-structured interview you should ask follow-up questions based on the student's responses.

In some cases, an unstructured interview is the best way to gather information. This is particularly true early in the action research process if you are collecting baseline data, if you want to use participant feedback as you plan your intervention, or if you want to know how participants feel the intervention is going. For example, a principal interested in investigating the use of teacher study groups might choose to begin his study by interviewing teachers about their opinions of the study group concept. Information provided would be very useful in planning how best to implement the study groups. If, for example, most interviewed teachers expressed that teachers should volunteer to be in study groups rather than be forced to participate in them, the principal would be wise to begin the study group intervention phase by asking teachers to participate. Once the volunteer study groups were formed, the principal could use unstructured interviews at the end of early study group sessions asking a broad question such as *In what ways, if any, is participation in this study group helping you in your classroom?* Feedback could be used for ongoing reflective planning for future study group sessions.

Structured interviews do not allow for the depth of responses and information that is so useful in action research studies. In fact, an interview that is too structured—one that allows for only *yes* and *no* answers, for example—is not much different from a survey. At times, though, a structured interview can be useful. A kindergarten teacher I worked with used a structured interview at the beginning of her study to determine her students' attitudes about writing. In the interview she asked questions such as *Do you like to write? Do you like working in our writing center?* and *Why do people write?* The teacher was able to determine students' attitudes about writing and their perceptions about the uses of writing before the study began. This provided her with baseline data, which was later used to compare students' attitudes about writing after the intervention had been utilized. It also provided her with information about students' perceptions of the purposes of writing, which guided the initial reflective planning as she prepared the intervention.

If you plan to interview participants in your action research study, consider these interviewing strategies provided by Seidman (1998):

- **Listen more and talk less.** Listen to what the interviewee is saying and make sure you understand it.
- **Follow up on what the interviewee says.** When you ask questions in an unstructured interview, make sure the questions are related to what the participant has said. Ask for clarification on points you do not understand, and ask the interviewee to provide a story or example to illustrate his or her point.

- **Avoid asking leading questions.** Don't use words or tones that imply the correct response. For example, don't say, *Why are study groups more fun than studying by yourself?* Instead say *Tell me about working in the study group.*
- **Keep interviewees focused and ask for specific details.** If an interviewee gets off the topic, guide him or her back to it. Ask for specific, concrete details about experiences (*Describe the activities you engaged in during the collaborative group exercises*).
- **Do not reinforce interviewees' responses.** Agreeing or disagreeing with an interviewee's response implies that there are correct and incorrect answers to your questions, which may impact the way he or she answers subsequent questions.

Focus groups are used for interviewing groups of participants. There are several advantages to using focus groups. One advantage is that focus groups allow for interviewing many participants at one time. Also, as Fontana and Frey (1998) explain, focus groups are "data rich, flexible, stimulating to respondents, recall aiding, and cumulative and collaborative" (p. 55). In a focus group interview, responses of one participant can help other participants recall important information that they wish to share. Members of the focus group respond not only to the researcher, who moderates the discussion, but to other individuals in the focus group. Thus, responses to questions build on others' responses, which can result in much richer data than that collected in individual interviews.

Moderating a focus group discussion involves more work on the part of the researcher than conducting individual interviews. Fontana and Frey (1998) provide several useful suggestions for moderating focus groups:

- *Do not allow a person or a small group of people to dominate the discussion.*
- *Encourage participation from silent focus group members.*
- *Obtain responses from all members of the focus group.*
- *Balance the task of moderating the group and asking structured questions with allowing for evolving questions and interactions.*

Also, follow the guidelines for interviewing listed earlier. Make sure to ask questions and guide the focus group discussion to elicit responses that will help answer primary and secondary research questions. Listen more than you talk. Ask for clarification. Emphasize the importance of honest responses.

Conferencing involves in-depth conversation between the researcher and a participant relating to some aspect of the action research study. Often, conferencing is used by a teacher in conjunction with a student work product. For example, a teacher studying ways to improve writing achievement could conference with a student about an essay written for class. The point of the conference would be to obtain information about the process of writing the essay. Questions such as *How did you choose your essay topic? What strategies did you use to organize your paper?* and *How did you come up with the thesis for your paper?* are a few examples of the kinds of questions that could be asked during the conferencing session. Conferencing used in this way can be instructional because it allows for conversation and discussion of the elements of writing, and it can be informational because it provides the teacher with data regarding the strategies the student used during the writing process.

A teacher I recently worked with conducted an action research study on the effectiveness of her mentoring of a first-year teacher. Throughout the study the mentor teacher used conferencing to discuss with the new teacher the effectiveness of various strategies the mentor had shared (classroom management techniques, instructional strategies). The conferencing sessions provided the mentor with a rich source of data: The mentored teacher gave feedback on the effectiveness of the mentor's strategies and her perceptions of why they did or did not work. The mentored teacher also shared information about difficulties she was still encountering in the classroom and asked for assistance in some of those areas, which provided the mentor with data for ongoing reflective planning. Finally, the mentor teacher was able to analyze the exchanges made during the conferences with the mentored teacher, which provided an illustration of the relationship between the two teachers.

If you decide to collect verbal inquiry data, either in the form of interviews, focus groups, or conferencing, be sure to audio record all sessions. This will allow you the freedom to actively listen during conversations with interviewees without having to take detailed notes. Follow the suggestions for audio recording provided in the section on observations. Remember that you will need to transcribe the audiotapes prior to analyzing the verbal inquiry data, which can be a time-consuming task. If a large amount of audiotape is to be transcribed, consider hiring a professional transcriber.

Inquiry data, in addition to being collected through conversations with participants, can be collected in written form using surveys/questionnaires or attitude scales. The benefit of these methods is that information can be collected from many participants at one time. It can take hours or even days to interview all students in a class, but a questionnaire can be given to that same class and completed in just a few minutes. Analyzing written inquiry data also takes less time than analyzing verbal inquiry data. The disadvantage of written inquiry data is that it does not allow for the depth of response that verbal inquiry data allows. Further, it is much easier to get participants to verbally answer questions and provide detailed responses than it is to get participants to provide detailed written information on open-ended questions.

Surveys or *questionnaires* are a good alternative to the structured interview. Questions asked during a structured interview can instead be written on a survey and distributed to participants—providing that participants are able to read the survey. In the earlier example of the kindergarten teacher's structured interview, it would not be wise to use a survey instead of an interview because children would not be able to read the survey. Keep in mind that if you use a survey in your action research study that your participants' reading ability must be high enough so they can understand your written questions. Ensure that the reading level of your survey matches the reading level of your participants.

Surveys and questionnaires are good alternatives to interviews and focus groups when time constraints are such that interviewing is impossible or when the researcher is seeking responses to a predetermined set of questions. In some cases, participants may feel more comfortable providing honest answers to an anonymous survey as opposed to being subjected to an interview in which their identity is known. Consider, though, that sometimes it is critical that names are included on surveys. For example, you may want to compare multiple sources of data for each individual participant to determine whether a participant's work, your observations of the participant, and the participant's answers on a survey are related. If this is the case in your study, you should have participants include

their names on surveys. If matching different types of data is not important in your study, using an anonymous survey is fine.

If you plan to use a survey in your action research study, first consider how data from the survey will help you answer your primary and/or secondary research questions. Refer to your research questions as you plan questions for your survey. Consider this example: A middle school language arts teacher is interested in studying the effectiveness of literature circles for increasing student achievement and interest in reading. His primary research questions are: *Does the use of literature circles increase students' reading achievement?* and *Does the use of literature circles increase students' interest in reading?* Secondary questions relate to *why* questions: *Why are literature circles effective (or ineffective) for increasing achievement and interest in reading? In what ways does participating in literature circles change students' attitudes about reading?* The teacher could use a survey to measure students' perceptions of literature circles. An example is included in Figure 5.13.

FIGURE 5.13 Student survey on literature circles (Mr. Kaston, 7th grade).

Students, please complete this survey on literature circles. Answer each question and provide as much information as you can on the open-ended questions. It is important to be honest in your answers because I will use the information you provide to help me plan future language arts lessons. You do not have to put your name on this survey. Thanks for helping me with this important project. Mr. K.

1. What have you learned about reading as a result of participating in your literature circle?

2. After participating in your literature circle, do you feel you are a better reader, a worse reader, or about the same kind of reader you were before working in the literature circle?
   (circle one) Better Worse Same

   Why?

3. Has participating in the literature circle changed the way you feel about reading for school?
   (circle one) Yes No

   If yes, how has it changed the way you feel about reading for school?

4. Has participating in the literature circle changed the way you feel about reading for fun?
   (circle one) Yes No

   If yes, how has it changed the way you feel about reading for fun?

5. What activities during the literature circle have been most helpful to you?

6. What activities during the literature circle have been least helpful to you?

7. How can we improve the literature circle activities?

8. Is there anything else you would like to say about literature circles? If so, please write your comments here.

The literature circle survey provided in Figure 5.13 is aligned with the teacher's research questions. Survey question 2 relates to students' perceptions of how their reading achievement has changed as a result of participating in literature circles. Question 1 provides students with an opportunity to explain how literature circles have helped them develop reading skills. Questions 3 and 4 are concerned with students' attitudes about reading and how the literature circles have impacted those attitudes. The remaining questions allow students to express ways the literature circles have been effective and ineffective and provide students with an opportunity to give feedback on ways to improve the literature circle activities. Notice, too, that the survey begins with a request to provide detailed information. The teacher has also explained the importance of providing honest responses and has increased his chances to get honest responses by telling students they do not have to write their names on the survey.

Surveys have a variety of uses in action research studies. They can be used with different types of participants—students, teachers, parents, school staff, administrators—and they are a simple way to collect data on large groups of participants. Here are several suggestions for those interested in using surveys or questionnaires in action research studies:

- **Ensure that survey questions are aligned with research questions** (Burns, 1999). It is critical that you create your survey so that it will provide the kinds of information you need to answer your research questions. Refer to your primary and secondary research questions often as you work on your survey items.
- **Pilot test the survey before administering it to participants** (Burns, 1999). Pilot testing the survey with a small group of participants or having colleagues or collaborators evaluate the survey before it is administered is a good way to identify any problems. The pilot test or collaborator review can help identify reading level problems, ambiguous questions, redundancies, instructions that are unclear, and unnecessary questions.
- **Keep your survey brief and to the point.** The longer your survey, the less likely that your participants will complete it. Also, participants generally will not provide in-depth responses to open-ended questions on a long survey.
- **Do not ask questions that are unrelated to your primary or secondary research questions.** Often researchers will include questions on their surveys because they think responses will be interesting. For example, the language arts teacher who created the literature circle survey in Figure 5.13 may be interested in whether students' parents read at home and in fact may hypothesize that his best readers come from homes where reading is valued. But including a question on parents' reading habits will in no way help the teacher answer his research questions. Avoid including questions in your survey about gender, race, or other demographic variables unless they are specifically related to your research questions. Avoid any other questions that are only tangentially related to your study.

Attitude scales are surveys that focus on the way participants feel about certain topics. They are useful to researchers in a variety of ways: to measure students' attitudes about

school, their abilities, or their self-concept; to measure teachers' attitudes about school policies, school climate, mentoring activities, or professional development activities; and to measure parents' attitudes about school rules, or availability of teachers, staff, and administrators (to name just a few). Attitude scales typically contain close-ended questions to which participants choose a response—such as *I am confident in my ability to multiply fractions: strongly agree, agree, disagree,* and *strongly disagree*—although open-ended items are also occasionally included.

The guidelines for creating an attitude scale are similar for the survey guidelines listed previously. In addition, a number of attitude scales have been published in the literature that may be useful in your study. These include the School Achievement Motivation Scale (Chiu, 1997), the Teacher Rating of Academic Achievement Motivation (Stinnett, Oehler-Stinnett, & Stout, 1991), the Reader Self-Perception Scale (Henk & Melnick, 1995), the Writer Self-Perception Scale (Bottomley, Henk, & Melnick, 1998), the scale for Teacher-Perceived Student Behaviors: Disrespect, Sociability, and Attentiveness (Friedman, 1994), and the Early Adolescent Self-Esteem Scale (DuBois, Felner, Brand, Phillips, & Lease, 1996). A number of other attitude scales are also available, and they can be found in academic journals and teacher magazines. Conduct an online search and library search to locate scales in your area of research.

If you use an established or published attitude scale, make sure the reading level is appropriate for your participants. You may need to make changes to the scale so that items align with the purpose of your action research study. If you plan to create your own attitude scale, make sure that the response choices on the scale are appropriate for the questions. For example, appropriate response choices to the prompt *I am confident in my ability to multiply fractions* are*strongly agree, agree, disagree,* and *strongly disagree.* It would not be appropriate to use responses choices such as *always, frequently, sometimes,* and *never* for the prompt unless the purpose of the study is to measure *how often* students are confident in their ability to multiply fractions. Be sure to pilot test the scale or have a collaborator review it before administering the scale. An attitude scale for math is included in Figure 5.14. This attitude scale could be used in a study by a teacher who wished to determine students' confidence in completing certain math tasks before and after implementing an intervention.

THE IMPORTANCE OF COLLECTING BASELINE DATA

The preceding section introduced a number of ways to collect data in your action research study: through artifacts, observations, and inquiry. As you decide on the best ways to collect data to answer your research questions, you may need to think about collecting baseline data before beginning your intervention. Baseline data are collected before the implementation of an intervention, and they are used to make comparisons of participants before and after the intervention occurs. If you are a teacher interested in examining the ways a strategy for teaching the writing process impacts students' writ-

FIGURE 5.14 Mathematics attitude scale, Mrs. Cho, 5th grade.

Students, please complete this attitude scale. Please write your name on this sheet because I will use it to plan activities to help you improve your achievement in math. It is important that you are honest in your responses. Your honesty will help me plan the best instructional activities for you.

Rate your confidence in completing each activity by circling one of the choices (very confident, somewhat confident, not confident at all).

1. I am confident in my ability to add fractions that have the same denominator.

   very confident **somewhat confident** **not at all confident**

2. I am confident in my ability to add fractions that have different denominators.

   very confident **somewhat confident** **not at all confident**

3. I am confident in my ability to multiply simple fractions (such as $\frac{1}{2} \times \frac{1}{4}$).

   very confident **somewhat confident** **not at all confident**

4. I am confident in my ability to multiply complex fractions (such as $2\frac{1}{2} \times 3\frac{1}{4}$).

   very confident **somewhat confident** **not at all confident**

5. I am confident in my ability to divide simple fractions (such as $\frac{1}{2} \div \frac{1}{4}$).

   very confident **somewhat confident** **not at all confident**

6. I am confident in my ability to divide complex fractions (such as $8\frac{1}{2} \div 2\frac{1}{4}$).

   very confident **somewhat confident** **not at all confident**

ing achievement, it would be a good idea to collect writing samples from students before the implementing the strategy intervention. Collecting writing samples during and after the intervention would allow you to determine the ways in which students' writing improved. If, instead, you only measured student writing after the completion of the intervention, it would be impossible for you to determine the ways that students' writing was impacted by the intervention.

As you plan ways to collect data to answer your research questions, think about whether baseline data are important in your study. If you wish to determine ways in which

an intervention impacts achievement or attitudes, you will need to measure these constructs before beginning the implementation phase of your study. Artifacts created by participants before intervention implementation are one source of baseline data. You may be able to use existing artifacts, or you may need to have participants create certain artifacts to produce baseline data. You can also make baseline observations, conduct baseline interviews, or collect baseline surveys prior to implementing your intervention.

ALIGNING DATA COLLECTION STRATEGIES WITH RESEARCH QUESTIONS

Aligning data collection strategies with research questions has been stressed throughout this chapter, and it will be repeated here one last time. It is absolutely essential that you refer to your primary and secondary research questions as you determine the best ways to collect data for your study. Ask yourself these questions:

- What types of data should I collect to answer my primary research question?
- What types of data should I collect to answer my secondary research questions?
- What types of data should I collect to help answer the *why* questions in my study?

Work with a collaborator as you work through this critical step of determining ways to collect data to answer your research questions. If you are able to bounce ideas off of a collaborator—or even a peer who is not formally collaborating in your study—you have a better chance of choosing appropriate data collection techniques for your study.

Here are some suggestions for making sure data collection strategies match research questions:

- Refer to your primary and secondary research questions as a first step in choosing data collection strategies.
- If the purpose of your study is to increase student achievement, be sure to choose several types of student-generated artifacts to examine as one data source.
- If the purpose of your study is to examine changes in attitudes, feelings, or opinions, use verbal and/or written inquiry data as one data source.
- Regardless of the purpose of your study, it is critical to utilize observational data. In rare instances, observational data are not useful, but in most action research studies utilizing observational data is essential for understanding the reasons why an intervention was successful or unsuccessful.
- Choose multiple data collection strategies so that you will be able to triangulate data.
- Work with a collaborator or peer in the data collection development process.

In Activity 5.1, you will complete several activities that will assist you in creating your data collection plan and ensuring that the chosen data collection strategies are aligned with your primary and secondary research questions.

ACTIVITY 5.1
CHOOSING DATA COLLECTION STRATEGIES

1. Write your primary and secondary research questions. Leave several lines of open space between questions.
2. Under each question, write at least three (but no more than five) data collection strategies that can help you answer the research question. Provide examples of the specific kinds of information you plan to obtain (for example, instead of writing *I will use student-generated artifacts* write something more specific such as *I will have students complete persuasive essays as a form of student-generated artifact*).
3. Determine whether baseline data are important in your study. Write a justification for your determination. If you do plan to collect baseline data, explain which data collection strategies you plan to use and provide examples of the specific types of baseline data you plan to obtain.
4. In a sentence or two, write an explanation of how the data collection strategies (including baseline strategies, if appropriate) will provide you with the data you need to answer your research questions.
5. Share your data collection ideas and the information you have written thus far for this activity with a collaborator or peer. Obtain feedback and suggestions on ways to improve your data collection plan. Write down feedback provided.

Research Paper Activity: Based on collaborator/peer assistance and your reflections on your answers to the previous questions in this activity, write a data collection plan for your study. For each research question, write a detailed explanation of the types of data you will collect (including baseline data, if appropriate) and a timeline or timeframe for collecting data. Provide a justification for your data collection plan that explains how your plan will help you answer your research questions. Place this information under a heading such as *Data Collection Plan* or *Data Collection Strategies* and have it follow the section on the intervention.

Journal Activity: Use your journal as a place to make or keep observational records. Make a commitment to write in your journal each day that the intervention is implemented. Make notes on the way you are implementing your intervention as well as the way participants respond to the intervention.

SUMMARY

This chapter explained the importance of triangulating data sources to increase credibility in action research studies. It also focused on describing multiple ways to collect artifacts, conduct observations, and acquire inquiry data, and an explanation of how to collect baseline data was provided. Finally, methods for ensuring that data collection strategies are aligned with research questions were described. Activity 5.1 led you through the steps of creating a data collection plan. Once your plan is in place, you will be ready to complete the final steps of research planning and then begin implementation of the intervention phase of your study. Chapter 6 focuses on these final steps of the planning process—increasing validity of the study, engaging in continuous reflective planning, following ethical guidelines for research, and establishing a timeline for the research project.