

# STEPS FOR FACILITATING SESSION THREE

**Objectives:** By the end of the third session, participants will be able to...

- Explain quantitative and qualitative data analysis
- Analyze the data for their research projects
- Prepare data analysis plans
- Write research project reports
- Discuss experiences as practitioner researchers

**Time:** 1 day (7 ¼ hours)

## Preparation:



**NEWSPRINTS** (Prepare ahead of time: Underlined in the steps)

- \_\_\_ Session Three Objectives
- \_\_\_ Session Three Agenda
- \_\_\_ “Continuum” Small Group Discussion Questions and Directions
- \_\_\_ Template: Taking Stock of Our Data
- \_\_\_ Talking About Your Data and Your Analysis Plan
- \_\_\_ Writing Assignment Before (Date of Fourth Session)
- \_\_\_ Thinking, Feeling, Acting



**HANDOUTS** (Photocopy ahead of time: *Italicized* in the steps)

- \_\_\_ Session Three Agenda [*revise* as needed]
- \_\_\_ A Process for Making Sense of Your Qualitative Data
- \_\_\_ Qualitative Data Analysis in Three Steps
- \_\_\_ Let’s Do Some Research

- \_\_\_ Statistics 101
- \_\_\_ General Recommendations for Writing Research Reports
- \_\_\_ Preparing the One-Page Handout and the Poster
- \_\_\_ One-Page Handout: Sample A
- \_\_\_ One-Page Handout: Sample B

(Make a few extra copies of the reading for Session Three for participants who forget to bring them.)

### **MATERIALS**

- \_\_\_ two signs—positive, negative
- \_\_\_ four or five “ball in cup” toys (The toy is a small cup with a long handle, a string attached from the handle to the ball, and you flip up the ball to try to catch it in the cup. The toy usually costs about \$3.00 each at toy stores.)
- \_\_\_ strips of paper with numbers written on them (one number for each participant), with half of the strips having an “X” marked on them, in addition to the number (If there are eight participants, the strips are marked 1, 2, 3X, 4, 5, 6X, 7X, 8X)
- \_\_\_ poster board (one per person)
- \_\_\_ sticky notes
- \_\_\_ blank newsprint sheets
- \_\_\_ newsprint easel
- \_\_\_ markers, pens, tape

**STEPS:****1. WELCOME AND INTRODUCTIONS**

(20 MINUTES)

- Welcome participants to the third session of the practitioner research training.
- Ask the participants to find something in their purses, wallets, or briefcases that says something important about them or that is important to them. Ask them to re-introduce themselves and explain their items. The facilitator writes the names of the items and what they signify on newsprint. At the end of the introductions, ask the group to categorize the items and find themes (“What do these items say about us as a group?”).

Summarize this activity by drawing parallels to data analysis. The names of the items and what they signified is the *data* that was collected. Looking at themes is the *analysis* of the data. The themes allowed the group to draw *conclusions* about the group.

- **Post the newsprints** Session Three Objectives and Session Three Agenda.

**Session Three Objectives**

By the end of the session, you will be able to:

- Explain quantitative and qualitative data analysis
- Analyze the data for your research project
- Prepare a data analysis plan
- Write your research project report
- Discuss experiences as a practitioner researcher

<b>Session Three Agenda</b>	
1.	Welcome and Introductions
2.	Focus on Your Research Experience So Far as an Introduction to Qualitative Analysis
3.	An Introduction to Quantitative Data Analysis
4.	Taking Stock of Our Data
5.	Individual Data Analysis and Planning
6.	Next Steps in Writing
7.	Preparing for the Final Session and Presentations
8.	Evaluation of the Session

-  **Distribute the handout** *Session Three Agenda* and ask if there are any questions or comments about the objectives or agenda.

## 2. FOCUS ON YOUR RESEARCH EXPERIENCE SO FAR AS AN INTRODUCTION TO QUALITATIVE ANALYSIS<sup>1</sup> (60 MINUTES)

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- **Explain to participants that the purpose** of this session is to assess how participants feel now about their research projects, and use that assessment as “grist” for data analysis. It will help them to share what they are doing now in their research and it will set the stage for learning about qualitative data analysis and developing a data analysis plan for their research. The research question that would drive this study, if it were a real piece of research, would be: “What are participants’ experiences with their practitioner research projects?”
- **Identify an imaginary continuum** in the room. Post a sign at one end of the room that says “positive” and a sign at the other end of the room that says “negative.” Ask the participants to place themselves at a point on the continuum that most closely corresponds to how they currently feel about their research work. Make note on a

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<sup>1</sup> Adapted from “Categorically Speaking,” an activity in Meeting Three of Practitioner Research as Staff Development: A Facilitator’s Guide. ([www.aelweb.vcu.edu/publications/research/meetings/meeting3/session10/index.htm](http://www.aelweb.vcu.edu/publications/research/meetings/meeting3/session10/index.htm))

sheet of newsprint where participants are standing, using their first names.

- **Ask the participants to share comments** about their placement on the continuum: Are most participants feeling pretty good about where they are now, or are more of them struggling?
- While participants are still standing “on the continuum,” ask them to form small groups based on where they are standing (i.e., “mostly negative” group, “middle” group, and “mostly positive” group?) If most participants are clumped at one end, divide that whole group into smaller groups.
- **Post the newsprint** “Continuum” Small Group Discussion Questions and Directions.

**“Continuum” Small Group Discussion Questions and Directions**

- Why did you stand where you did on the continuum?
- What does it mean to you that you are at that spot now in your research?

Directions:

1. In the small groups, each person takes five minutes to answer the questions below while others listen. Someone keeps notes (i.e., Sue: “why did you...” and “what does it mean” is.....)
2. After each person has talked, think about what you’ve said and heard from group members. Find a common theme or pattern in your experiences. Name the common theme (e.g., “making progress,” or “challenging”).
3. Write the theme (words or paraphrases) on newsprint (e.g., “feeling stuck” or “exciting progress”), and post the newsprint.

- **Ask the participants to share the answers** to the questions at the top of the newsprint. Ask them to identify someone to keep notes about what each person says about the “why” and “what does it mean” questions.
- **Then ask the small groups to name their collective experiences.** In a word, phrase, or sentence, what does the group think their particular position on the continuum

means? Suggest, as the groups consider their discussions, that they pay attention to the similarities and differences in everyone's comments. Advise them that as they go through this process, participants should begin to notice some emerging ideas or themes—patterns that stand out and capture the essence of their experiences. Ask the participants to write the names of these themes on a piece of newsprint. Tell them to identify a person who will report to the whole group on the name that the group chose and two or three main points of discussion. Ask the small groups to take 25 minutes for their discussions and to post their themes.

- **Reconvene the whole group.** Ask each group's representative to take a couple of minutes to report. Stand back and review the names that the groups selected. After all the groups report, summarize the reports, talking through the findings—common themes, etc.—across all the groups (if any). Facilitate a discussion with the whole group about:
  - the conclusions of this activity: What does this mean about where we are in the research?
  - implications of these findings: What does this mean for what we should do in the training or between training sessions to support and help?
- **Facilitate a discussion with the whole group to deconstruct the entire activity.** Begin at the point when the participants chose a place on the continuum. Finish with the small group work in which participants had to capture and name their shared experiences and named themes. Invite the participants to call out the various steps that they followed from beginning to end. Write the steps on newsprint.
- **Point out how the steps** that they took in this activity relate to those the participants might take when they first begin to analyze their research data. The steps may include:
  - participants becoming familiar with all the information they collected

- sorting and organizing data
- determining what the data is “about”
- capturing the essence
- identifying themes or ideas that stand out
- looking for patterns
- naming what the data is about
- **Point out the following features of *qualitative data analysis*:**
  - Data analysis is a highly subjective, intuitive, and personal process.
  - There are guidelines that researchers use to make sense of data, but there is no “one way” or “right way” to go about it.
  - Data analysis is non-linear and back and forth.
  - Researchers use a deductive or inductive approach.
  - People all have biases that affect how they view the world...and interpret their research data.
- **Ask the participants to share** what they learned from this activity. Address any major concerns or questions participants may have about where they are in the research process.
-  **Distribute the handouts** *A Process for Making Sense of Your Qualitative Data* and *Qualitative Data Analysis in Three Steps*.

### Break (15 minutes)

## 3. AN INTRODUCTION TO QUANTITATIVE DATA ANALYSIS

(60 MINUTES)

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- **Explain to participants that the purpose** of this activity is to learn experientially about quantitative data analysis. By participating in creating numeric data through a skill-

building activity, they can then explore how to analyze such data and understand factors that may account for improvement in skill.

- **Introduce the activity by explaining** that the point of the task is to give the group some data that they can then use to walk through an analysis process. The research question that would drive this study, if it were a real study, is: “Does practice in trying to flip the ball into the cup lead to improvements in that skill?”
-  **Distribute the handout** *Let’s Do Some Research*. Ask the participants to skim through it.
- **Ask each person to select a strip of paper.** There should be one strip for every participant. Each strip will have a number, and half of the strips will also have an “X” marked somewhere on them. This randomly puts participants into experimental and control groups. Strips should be folded in half so that the numbers and the “X”s are not visible. Once they have selected their strips, they should look at their numbers and see whether or not they have an “X” marked on their papers.
- **Bring the whole group to the front of the room.** Ask them to separate into two groups, those with an “X” and those without. At this point, you don’t need to tell them what the “X” means, just that you have two groups. Using the ball-in-cup toys, have each person in turn take 10 tries at flipping the ball into the cup. Keep track on newsprint of how many successful attempts the person has (i.e., Sarah = 3 out of 10; John = 5 out of 10). Explain that this is their “baseline” performance on the task.
- **After each person has taken 10 tries,** ask the “X’s” to take a ball-in-cup toy and go outside in the hallway. They are to practice, in any manner they choose, for five minutes. Explain that this group is the “experimental” group. The group that still remains in the room is the “control” group. These control group members are not getting the “intervention” of practice. While the experimental group is

practicing in the hall, the control group looks at the data on the newsprint and draws some preliminary results: what's the range of scores, do they diverge widely, what's the mean, median, and mode, and what's the best way to report the average, etc.?

- **After five minutes, ask the experimental group to come back into the room.** Ask the group who practiced to talk about how they practiced: what did they each do as individuals to get better? (This constitutes the “intervention.” Sometimes in studies it is just more practice, like attending any adult education class for longer, and in other studies, the intervention is something new that everyone in the “treatment” or experimental group does the same.)
- **Ask everyone to do the test again,** even those who didn't practice. Record the new scores on the newsprint. This second set of scores is called the “post-test.” Then walk through the analysis phase: what is the range of scores for the post-test; what's the best way to do the average; what's the standard deviation and is that helpful in interpreting the results? Discuss how this is “descriptive” data analysis. It's describing the data in standard and accepted ways that will help in interpreting it.
- **Invite the group to analyze the data:**
  - ? What's the difference between the means in the pre-test and the post-test and between the two groups? (*finding*)
  - ? Is that difference large enough to be a significant difference? (*analysis*)
  - ? What are some of the factors (other than the practice time) that might explain the difference in scores, such as people's previous experience with the toy, physical coordination, etc.? (*rival hypotheses, other variables*)
  - ? What do you conclude about whether or not practice helps to improve skill and how important are the factors in the findings? (*conclusion*)

- ? What are the implications of this research for others who may want to improve their skill at doing the “ball-in-cup” task? (*implications*)
- **Finally, discuss the limitations of this study:**
  - ? How does the number of “subjects” in the sample affect how comfortable you feel about generalizing this to other, non-adult education teacher populations of people? What about how the control and experimental groups were chosen? What about the choosing of the sample itself (Is there something unique about people who decide to attend a practitioner research training, or about adult basic education instructors, that would affect their skill?)( *size of “n,” sampling*)
  - ? What else, other than counting successful attempts, could be used as a measurement (number of successful attempts in two minutes)? Would the results have been different? Was the right measurement chosen to test whether skill increased? (*validity*)
  - ? Were the measurements accurate? Were all subjects measured the same way? (*reliability*)
- **Conclude the activity by asking for general questions about quantitative data analysis.** Ask the participants to share how this activity helps them to understand what to do with their own data.
-  **Distribute the handout** *Statistics 101*. Ask the participants to skim through it and answer any questions they might have.

#### 4. TAKING STOCK OF OUR DATA

(45 MINUTES)

- Explain to the participants that the purpose of this activity is to find out what kinds of data they have collected and how much.
- Post the newsprint Template: Taking Stock of Our Data.

**Template: Taking Stock of Our Data**

Research question:

Type of data collected (quantitative, qualitative, or both):

Data collection instruments (interviews, tests (TABE, CASAS), portfolios):

Amount of data collected already (how much information from how many students):

Amount of data still to be collected (how much information from how many students):

Timeline by when you will have completed collection:

Successes and challenges so far:

- **Explain to participants that they will take an inventory of the group’s data.** Ask participants to prepare inventories by listing the types and amount of data they have already collected, and what other data they still plan to collect. Relate these categories to examples from the Continuum and Ball-in-Cup exercises. Distribute blank newsprint to each participant and ask them to take 15 minutes to write responses to the prompts on the template.
- **Invite the participants to post their newsprints.** As in a gallery review, ask the participants to walk around the room and silently read the newsprints. Invite participants to ask clarification questions.
- **Ask the group to identify “like” data collection methods** (such as testing, interviews, etc.). Group the newsprints according to the “like” data collection methods. Explain to participants that they will be forming groups later so that those who are using the same type of data collection can help each other with their data analysis plans.

### **Lunch (60 minutes)**

**5. INDIVIDUAL DATA ANALYSIS AND PLANNING**

(100 MINUTES)

**Note to Facilitator**

This is also a time for facilitator-participant conferences. Let the group know where you will be stationed throughout this period.

- **Explain to participants that the purpose** of this activity is for them to begin analyzing their own research data and to think about their plan for analyzing data.
- **Invite the participants to form pairs and trios** according to the “like” data collection methods that they identified in the previous step. Ask them to take 50 minutes to share with each other the data they have, to analyze their own data (probably just baseline data at this point) or to continue working from wherever they are in the process, and to develop a plan for data analysis.

Remind participants to use the handouts distributed to them about quantitative and qualitative data analysis:

- *A Process for Making Sense of Your Data*
- *Qualitative Data Analysis in Three Steps*
- *Let’s Do Some Research*
- *Statistics 101*
- **Also, tell participants what to expect** when the whole group reconvenes. They will share their progress with the other practitioner researchers.
- **Post the newspaper** *Talking About Your Data and Your Analysis Plan*. Ask the participants to be prepared to share the following information.

**Talking About Your Data and Your Analysis Plan**

- Share the data you have (may be baseline data) and do some analysis to generate one or two preliminary findings (or examples of data, if you do not yet have findings).
- Explain briefly how you plan to analyze the data that you (will) have: What will I do with this information and data? How do I plan to make sense of it?

- **Ask the participants to prepare a visual or graphical representation** (poster, flow chart, table, map, diagram, or drawing) to help explain what is going on in their data and

how they plan to make sense of it. The participants' presentations should be no more than three minutes. There will be a brief time for questions and comments following each research presentation.

- **After 50 minutes reconvene the whole group.** Ask the participants to take three minutes each to present the visual or graphical representation of their data and analysis plan.
- After all of the participants make their presentations, **use these questions to help facilitate a discussion:**
  - ? How do you feel about what happened in the presentations/discussions?
  - ? What do you understand better now, as a result?
  - ? What did the activity suggest to you about the data analysis process?
  - ? What did the activity suggest to you about continuing your own work?

### Break (15 minutes)

## 6. NEXT STEPS IN WRITING

(20 MINUTES)

- **Explain to participants that the purpose of this activity is** to plan for writing the data analysis sections of their reports: How will you analyze the data and determine the findings and conclusions?
-  **Distribute the handout** *General Recommendations for Writing Research Reports*. Refer to the handout *Writing Your Research Project Report* (from Session Two). Ask the group to brainstorm additions to the general recommendations, based on writing their own reports and reading the reports of others. Write these recommendations on newsprint and ask the participants to add them to their own handouts.

#### Note to Facilitator

Distribute your feedback, if any, on their reports to them individually.

- **Post the newsprint Writing Assignment Before (Date of Fourth Session).** Tell participants that this is the next writing assignment:

**Writing Assignment Before (Date of Fourth Session)**

Your plan and methods for analyzing the data

Your findings

Your conclusions

Next steps

- Facilitate a brief discussion of the difference between findings and conclusions, making the following points:

*Findings:* What did the information say? What happened to X? What else, if anything, could explain this, other than the new strategy I tried?

*Conclusions:* What’s the answer to my research question? What does that mean for my work and for the students I teach? What does that mean for my program? What are the limitations about what I found for other teachers, for other students? What are my theories about the situation now that I have all the data before me?

- Explain that the final part of the research report—next steps (Now what? What will you do next in your classroom? What further questions might you explore? How do you feel about what you learned and what you did?)—may not be written before the final session, because they want to process their findings with the others before deciding what they want to do next.

**Note to Facilitator**

If you want final reports completed by the final session, you need to arrange to have the participants submit drafts to you by a specific date. You can review and return them for any final revisions.

## 7. PREPARING FOR THE FINAL SESSION AND PRESENTATIONS

(30 MINUTES)

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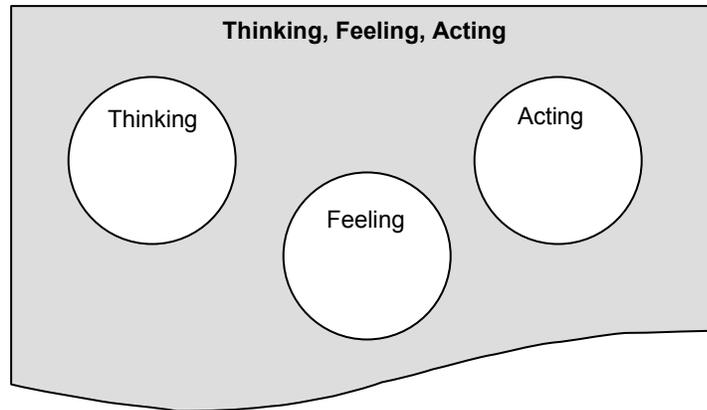
- Explain to participants that the purpose of this activity is to plan for the final stage of the research and how to best support them.
- Remind participants that you will help each individual by telephone and e-mail between now and the fourth session.
- Explain to participants that each person, in addition to writing a draft report, needs to prepare a one-page handout and a poster (with diagrams, etc.) that “covers” their research. Both should include the major components of their research—problem, question, data collected, findings, conclusions, implications, etc. These posters and handouts will be used in the presentations during the final session.
-  **Distribute the handouts** *Preparing the One-Page Handout and the Poster, One-Page Handout: Sample A, and One-Page Handout: Sample B.* Invite the participants to ask questions about preparing the handout and poster.
- If you plan to make copies of the participants’ One-Page Handout for distribution at Session Four, ask them to send you an electronic copy by a specific date. Otherwise, ask them to bring enough copies to distribute to the whole group.

## 8. EVALUATION OF THE SESSION

(10 MINUTES)

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- Post the newsprint Thinking, Feeling, Acting.



- Distribute sticky notes to each person. Ask the participants to silently and individually reflect on the session. Invite them to write comments on the sticky notes about how this session helped them increase their knowledge (thinking), efficacy (feeling), and skills (acting) *or* suggestions they have in those areas for how to make the session better.
- Thank the participants for their feedback and hard work, and encourage them to keep in touch via e-mail or telephone. Remind them to refer to the *Participants' To-Do Form* (from the Pre-Meeting Packet) for what to do for Session Four.
- **Repeat the date, time, and place for the next session.** If applicable, explain the process you will use for canceling and rescheduling the next session in the event of bad weather.

<b>Quick Reference Sheet for Facilitating Session Three</b>	
<b>1. Welcome and Introductions</b>	<i>20 mins., WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Everyone introduces themselves, using a “found” object.</li> <li>• Post newsprints <u>Session Three Objectives</u> and <u>Session Three Agenda</u>; distribute handout <i>Session Three Agenda</i>; review.</li> </ul>	
<b>2. Focus on Your Research Experience So Far as an Introduction to Qualitative Analysis</b>	<i>60 mins., WHOLE GROUP, then SMALL GROUP, then WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Post signs (positive, negative); participants stand along continuum and share comments.</li> <li>• Form groups based on continuum; post newsprint “<u>Continuum</u>” <u>Small Group Discussion Questions and Directions</u> for small group discussion.</li> <li>• Small groups name themes and report to whole group.</li> <li>• Whole group discussion on conclusions of this activity and implications of the findings; list steps on newsprint and relate to qualitative data analysis.</li> <li>• Distribute handouts <i>A Process for Making Sense of Your Qualitative Data</i> and <i>Qualitative Data Analysis in Three Steps</i>.</li> </ul>	
<b>15–Minute Break</b>	
<b>3. An Introduction to Quantitative Data Analysis</b>	<i>60 mins., WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Distribute handout <i>Let’s Do Some Research</i> and numbered strips of paper.</li> <li>• Whole group performs test and records baseline data.</li> <li>• Experimental group practices and control group draws preliminary results.</li> <li>• Whole group performs test again and records scores; analyze data; discuss limitations of study.</li> <li>• Answer questions and distribute handout <i>Statistics 101</i>.</li> </ul>	
<b>4. Taking Stock of Our Data</b>	<i>45 mins., SMALL GROUPS</i>
<ul style="list-style-type: none"> <li>• Post newsprint <u>Template: Taking Stock of Our Data</u>; individuals respond to prompts and record answers on newsprint.</li> <li>• Conduct gallery review and invite clarification questions and identify “like” data collection methods.</li> </ul>	
<b>60–Minute Lunch</b>	

<b>Quick Reference Sheet for Facilitating Session Three</b>	
<b>5. Individual Data Analysis and Planning</b>	<i>100 mins., PAIRS, then INDIVIDUALS, then WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Form pairs/trios by data collection methods; share data; analyze data; and prepare plan for data analysis.</li> <li>• Post newsprint <u>Talking About Your Data and Your Analysis Plan</u>; each person prepares visual representation about their data.</li> <li>• Presentations on data and whole group discussion:               <ul style="list-style-type: none"> <li>? How do you feel about what happened in the presentations/discussions?</li> <li>? What do you understand better now, as a result?</li> <li>? What did the activity suggest to you about the data analysis process?</li> <li>? What did the activity suggest to you about continuing your own work?</li> </ul> </li> </ul>	
<b>15-Minute Break</b>	
<b>6. Next Steps in Writing</b>	<i>20 mins., WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Distribute handout <i>General Recommendations for Writing Research Reports</i>; add recommendations.</li> <li>• Post newsprint <u>Writing Assignment Before (Date of Fourth Session)</u>; review assignment.</li> <li>• Discuss findings, conclusions, and next steps.</li> </ul>	
<b>7. Preparing for the Final Session and Presentations</b>	<i>30 mins., WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Describe requirements for research report, one-page handout, and poster.</li> <li>• Distribute handouts <i>Preparing the One-Page Handout and the Poster, One-Page Handout: Sample A</i> and <i>One-Page Handout: Sample B</i>; answer questions.</li> </ul>	
<b>8. Evaluation of the Session</b>	<i>10 mins., INDIVIDUALS, then WHOLE GROUP</i>
<ul style="list-style-type: none"> <li>• Post newsprint <u>Thinking, Feeling, Acting</u>; individuals reflect on and post sticky notes about how this session increased knowledge, efficacy, and skills.</li> <li>• Remind participants of next session date, time, and location.</li> </ul>	

## Materials to Hand Out in Session Three

### CONTENTS

#### Handouts for Session Three

- Handout : *Session Three Agenda*
  - Handout : *A Process for Making Sense of Your Qualitative Data*
  - Handout : *Qualitative Data Analysis in Three Steps*
  - Handout : *Let's Do Some Research*
  - Handout : *Statistics 101*
  - Handout : *General Recommendations for Writing Research Reports*
  - Handout : *Preparing the One-Page Handout and the Poster*
  - Handout : *One-Page Handout: Sample A*
  - Handout : *One-Page Handout: Sample B*
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## Session Three Agenda

(7 ¼ HOURS)

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|--------------------|--|
| <i>20 minutes</i>  | 1. Welcome and Introductions   |
| <i>60 minutes</i>  | 2. Focus on Your Research Experience So Far as an Introduction to Qualitative Analysis |
| <i>15 minutes</i>  | <b>Break</b>   |
| <i>60 minutes</i>  | 3. An Introduction to Quantitative Data Analysis                                       |
| <i>45 minutes</i>  | 4. Taking Stock of Our Data  |
| <i>60 minutes</i>  | <b>Lunch</b>   |
| <i>100 minutes</i> | 5. Individual Data Analysis and Planning   |
| <i>15 minutes</i>  | <b>Break</b>   |
| <i>20 minutes</i>  | 6. Next Steps in Writing   |
| <i>30 minutes</i>  | 7. Preparing for the Final Session and Presentations                                   |
| <i>10 minutes</i>  | 8. Evaluation of the Session   |



## A Process for Making Sense of Your Qualitative Data<sup>2</sup>

Read	Become familiar with the material you will be working with. Read through all your data. Try to recall the setting, circumstances, the conditions, the people involved, and what was going on at the time. Keep your original research questions in mind as you read, but also be open to surprises embedded in what you have collected.
Annotate	Read through all of your data again, this time with a supply of colored pens on hand. After each passage, record a word or a phrase in the right-hand margin, which answers the question, "What is this about?" If questions come to mind as you read, make note of them in the margin using a different colored pen. If you have a particular insight about something, record this as well using a third color. Alternatively, you can keep a running list of your insights and emerging theories on a separate sheet of paper.
Organize	Now, review the many words and phrases you have generated. Record each of these on a separate index card or sticky note (no duplicates). Then organize your cards or notes into piles of closely related ideas. You may find, at this point, that some of your words and phrases are redundant, so some of your cards can perhaps be eliminated or similar ideas can be collapsed into one concept.

<sup>2</sup> Adapted from the Practitioner Inquiry Project, Department of Education, The University of Georgia (1997). Handout originally developed by Cassie Drennon and Jereann King for the Georgia Adult Literacy Inquiry Project and Literacy South. Durham, North Carolina (1995).

	<p>Attach a broad category name to each pile. The broad categories should be distinctive from one another. Each set of cards should represent a “family” of ideas beneath each of your broad categories. When you are satisfied with the categorization scheme you have devised, transfer it to a sheet of paper. Make a list of these different topics or themes beneath the relevant broad category. Assign each item on your list a consecutive number (code).</p>
Code and Sort	<p>Decide which data are relevant to your research and which are not. Read through your data again! This time, bracket passages that speak to your research questions. Record the appropriate code number describing that passage in the left-hand margin. When you have completed the coding of all of your data, cut the passages apart and sort them according to codes. If some passages have more than one code assigned, be sure to make additional copies of that section before you start cutting. Place the cut strips in folders or envelopes that are labeled according to their contents.</p>
Interpret	<p>Identify your findings. Study each broad category of data, one by one. Lay out the strips related to each sub-category and read through the various bits of data. Study, think, and write. Study, think, and write some more. What general statements can you make about what you are finding out through these data bits? What do you believe you now know based on what you have read here? Record these general statements or “findings” on a notepad. Indicate the data strips that speak directly to your findings—those that provide representative evidence of what you now know, so that you can quote these in a final report.</p> <p>If some of your data strips contradict your general findings, make a note of this. Be sure to not ignore the data that challenges your theory. What do you make of this contradictory data? How can these be explained? Share your findings and supportive data with colleagues or the people you have researched in order to get their perspective on your interpretations.</p> <p>Repeat this process for each of your broad categories and their corresponding sub-categories.</p>

<p>Present</p>	<p>Present the data in a way that is easy to take in at a glance. Draw, map, or diagram your initial findings. Use the visual representation to help you explain the data to a colleague, “This is what is going on in my data.” And, “This is how different aspects of my problem or situation are related to one another.” Or, “Here is a picture of what I see emerging in my data.” See if someone else understands what you are trying to convey through the visual.</p>
<p>Conclude</p>	<p>Tell the story you have heard through the data. Now that you have analyzed all the various aspects of your data and developed your findings, consider all the facts you have organized. Study the findings that you have recorded and consider what coherent story they tell. How does everything you have now learned fit together? How would you answer your research question now?</p> <p>What is the significance of what you have discovered? What are the implications for people involved? What other questions have been answered that perhaps you didn’t originally ask, but are, nevertheless, important? What is your theory about the situation now that you have the data before you? Try explaining your theory to a colleague using the examples from the data to substantiate your claims.</p>



## Qualitative Data Analysis in Three Steps

A Summary of Taylor & Bogdan<sup>3</sup> by Alisa Belzer, Pennsylvania Adult Literacy Practitioner Inquiry Network

### STEP ONE: DISCOVERY

Discovery is basically for the purpose of seeing, in a general sense, what's in your data.

- Read and reread your data. Know it inside and out; get very familiar with it.
- As you do so, you will notice that you have ideas and hunches. You'll start noticing things that repeat. Write down your ideas. Keep notes as you read; otherwise, you might lose some brilliant thoughts.
- Out of this process, you should start to notice some emerging themes—patterns that stand out, or are subtle.
- Construct typologies - schemes for classifying data - big, broad categories that have subcategories underneath. These might lead to your findings. It's a back-and-forth-process.
- Review the literature, if applicable. Think about whether you have run across any concepts that would be helpful or relate your work to the work others have done, i.e., how is your work similar or different?
- Develop a story line. What is the story your data tells? You may not tell everything, but think about what you would like to know if you heard a teacher somewhere else had done an inquiry project on the same area you did.

### STEP TWO: CODING

Coding is the process of marking all the data that fits with particular themes. This process enables participants to pick examples (or vignettes) from the data that will best illustrate the story. As participants code the data, they continually refine, change, or add to the categories. Coding is a process that continues data analysis.

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<sup>3</sup> Taylor S. & Bogdan R. (1984). "Working With Data" in *Introduction to Qualitative Research Methods: The search for meaning*. New York: Wiley.

1. Develop categories.
2. Code all the data.
3. Sort the data.
4. See what's unaccounted for.
5. Refine your analysis.

**STEP THREE: DISCOUNTING**

Discounting data may sound negative, but it is essentially an opportunity to consider the context in which different kinds of data were collected and to notice what difference that context might make on what was learned.

## Let's Do Some Research

Purpose	The purpose of this activity is to learn experientially about quantitative data analysis. The point of this activity is to give us some data that we can then use to walk through an analysis process. By participating in creating numeric data through a skill-building activity, we can then explore how to analyze such data and understand factors that may account for improvement in skill.																										
Research Question	The research question that would drive this study, if it were a real study, is: Does practice lead to improvements in that skill?																										
The Skill	<p>First, we'll test everyone on the skill (pre-test score). The individuals will have ten tries to get the ball into the cup. Record the score (number of successful tries):</p> <table data-bbox="475 972 935 1770"> <thead> <tr> <th data-bbox="475 972 699 1003">Name</th> <th data-bbox="857 972 935 1003">Score</th> </tr> </thead> <tbody> <tr><td>_____</td><td>_____</td></tr> </tbody> </table>	Name	Score	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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<p>Practice and Analysis</p>	<p>Now, the randomly selected “experimental” group will go outside and practice any way they want to for five minutes.</p> <p>The control group and the facilitator will look at the data and draw some preliminary results:</p> <p style="padding-left: 40px;">The range of results is _____ to _____.</p> <p style="padding-left: 40px;">Do the results diverge widely? yes/no</p> <p style="padding-left: 40px;">The mean (total of scores/number of people) is _____.</p> <p style="padding-left: 40px;">The median (arrange scores in order; select middle score) is _____.</p> <p style="padding-left: 40px;">What’s the best way to report the average—mean or median?</p> <p style="padding-left: 40px;">The standard deviation (find difference of each score from mean or median; total these differences and divide by the number of scores) is _____.</p> <p>When the experimental group comes back, record the different ways the experimental group practiced (the intervention):</p> <p style="padding-left: 100px;">_____</p>
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The Skill	Again, everyone (in both experimental and control group) will try to get the ball into the cup 10 times each. Record the scores for each group:	
	Control Group	Score
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	Remember, the experimental group practiced. This constitutes the “intervention.” Sometimes in studies it is just more practice, like attending any type of adult education classes longer, and in other studies, the intervention is something new to which everyone in the experimental group is exposed.	

Data Analysis	<p>Next, let's analyze the post-test data:</p> <p>The range of results on the post-test is _____ to _____.</p> <p>Do the results diverge widely? yes/no</p> <p>The mean (total of scores/number of people) is _____.</p> <p>The mean of each group is: control _____ experimental _____</p> <p>The median (arrange scores in order; select middle score) is _____.</p> <p>The median of each group: control _____ experimental _____</p> <p>What's the best way to report the average—mean or median?</p> <p>The standard deviation (find difference of each score from mean or median; total these differences and divide by the number of scores) is _____.</p> <p>Why do you think the standard deviation is helpful in interpreting the results?</p> <p>This is descriptive analysis. We are describing the data in standard and accepted ways that will help us interpret it.</p> <p>Let's consider the following questions:</p> <ul style="list-style-type: none"> <li>• What's the difference between the means in the pre-test and the post-test for the entire group (<i>finding</i>)? Is there a difference between the post-test means for the experimental sub-group and the group that did not practice?</li> <li>• Is that difference large enough to matter (<i>analysis</i>)?</li> <li>• What are some of the factors (other than the practice time) that might explain the difference in scores, such as people's height, balance, previous experience balancing things, gender, physical coordination, etc. (<i>rival hypotheses, other variables</i>)?</li> <li>• What do we conclude about whether practice helped to improve skill, and how important were the factors in the findings (<i>conclusion</i>)?</li> <li>• What are the implications of this for others who may want to improve their skill (<i>implications</i>)?</li> </ul>
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Limitations of the Study	<p>Finally, in the large group, discuss the limitations of the study:</p> <ul style="list-style-type: none"> <li>• How does the number of “subjects” in the sample affect how comfortable you feel about generalizing this to other populations of people? What about how the control and experimental groups were chosen? What about how the sample itself was chosen (Is there something unique about adult educators that would affect our skill?) (<i>size of “n,” sampling</i>)?</li> <li>• What else, other than counting successful attempts, could be used as a measurement (number of successful attempts in two minutes)? Would the results have been different? Was the right measurement chosen to test whether skill increased? Did the test measure the skill it was intended to measure (<i>validity</i>)?</li> <li>• Were our measurements accurate? Were all subjects measured the same way (<i>reliability</i>)?</li> </ul>
Wrap-up	<p>How does this help you to understand research studies? How might the research be conducted differently?</p>



## Statistics 101

Here are some beginning concepts (with *definitions in italics*) about statistics that may help you if you are using quantitative data.

**Statistics are based on two main concepts: averages and probabilities.**

### AVERAGES (MEANS)

Most quantitative research statistics rely on comparing averages (means). A mean is simply *the number you get when you add up all the scores and divide by the number of scores* (e.g., scores of 3, 4 and 5 add up to 12; divided by three scores equals a **mean** (or **average**) of 4).

The means (averages) that are most often compared are:

- The mean scores of one group of students who were exposed to a new approach (this group is called the experimental group) compared to the mean scores of another group of students who didn't get the new approach (this group is called the control or comparison group). This is called an **experimental design**.
- The mean scores of one group of students before they were exposed to a new approach (this is called their baseline mean or "pre-test score") and the mean scores of the same group after they were exposed to the new approach (their "post-test" score). This is called a **pre-/post- design**.
- The mean scores of one group of students who were exposed to a new approach compared to the mean scores of another group of students who were exposed to a different approach. This is called a **quasi-experimental design**. (It's not really experimental because there's no control group. Everyone is exposed to some type of educational approach).

### PROBABILITIES

**Probabilities** play a role in determining *whether the differences between two means are really reliable or an accident*. What are the chances (what is the probability) that the difference (or lack of difference) seen between two means is an accident?

Think about flipping a coin. There are only two outcomes: heads or tails. Common sense tells you that each time you flip a coin, there's a

50/50 (or 50% chance, or .50 chance) that it will be heads. However, you know that if you flip it 30 times, it might come up heads 20 times, and tails 10 times (heads 67% of the time or .67), rather than exactly heads 15 times and tails 15 times. If you flipped the coin 100 times, you might end up getting heads closer to, but not exactly, 50% of the time. But, if you had unlimited time and patience, you could flip it a million times, and you would probably end up with pretty close to 500,000 times that it's heads, and 500,000 times that it's tails.

In research you usually don't have the resources to test *all the students* (the whole **population** of students) in the school, the country, or the world. (You can only flip the coin so many times.) Statistics is based on the idea that you can only test *a limited number of students* (a **sample** of the whole population of students). So you want to know: What are the chances that with this number of students, my results will be the same as they would be if I tested a huge number, or the whole population?

**Statistics** is a *mathematical process of telling you how reliable your results are*, when you only have a sample of all the students to which the results could apply. So, naturally, the larger your sample, the less risk (the higher the probability) that the sample of students you have is just like the whole population.

Similarly, if you were to test someone multiple times with the same test, they wouldn't perform exactly the same way every time they took it; i.e., they wouldn't get the same score every time. One day they feel tired; the next day, they read the question a different way. If you kept testing them and testing them, you could probably average all their test scores and get a pretty good idea of what their skills are. But in most research, you can only test someone a few times at most. So, what are the odds that, the one or two times you tested them for your experiment, you got an accurate representation of their skills? When you test a group who has experienced a new educational intervention, and then test a group who hasn't had the intervention, what is the chance or probability that those test scores represent their skills, rather than just being "variation" in how each student took the test that day? How much of a difference between the scores of one group of students and those of the other group of students is really acceptable, given this variation, for you to say that the intervention made that difference, rather than the difference just being an accident of the scores they got on that test on that day?

Typically, the acceptable probability numbers are less than 1% or 5%. What this means is that, in comparing means, the statistics test tells you if there was less than a 1% chance or less than a 5% chance that these

two means could **accidentally** be as different as they are. When you see research reports that say, “The difference between the means was  $p < .05$ ,” this means that the statistical test indicates that there was less than a 5% chance that the means are different by accident.

### WHAT STANDARD DEVIATIONS ARE AND WHY THEY’RE HELPFUL

**Standard deviations** are the *average distance of all the scores from the mean*. It tells you how widely the scores vary from each other. Say that you have three scores:

1, 5, and 10. The mean is about 5.

Say that you have another group of scores:

4, 5 and 6. The mean here is also 5.

Now take the first group of scores, and take the difference between each score and the mean: Difference between 1 and 5 = 4. Difference between 5 and 5 = 0. Difference between 10 and 5 = 5. Now average those differences:  $4 + 0 + 5 = 9$  divided by 3 = 3. This—3—is the **standard deviation** of the scores 1, 5 and 10.

Now take the second group of scores, and take the difference between each score and the mean: Difference between 4 and 5 = 1. Difference between 5 and 5 = 0. Difference between 6 and 5 = 1. Now average those differences:  $1 + 0 + 1 = 2$  divided by 3 = .67.

So even though two groups of scores share the same mean (5), the standard deviation for one group of scores is 3, and the standard deviation for the other group of scores is .67. Generally, the smaller the standard deviation, the more representative the mean is. In other words, with a large standard deviation, it means the scores were widely variant: a few people might have done really badly, and so the mean might accidentally be **skewed**.

### WHEN THE CONCEPT OF MEDIAN IS USED

Sometimes, rather than an average (or mean), a **median** might be more helpful. This is particularly so when you have a few scores that are widely divergent from the mean (when you have a high standard deviation).

Consider, for example, income in the United States. While most people make anywhere from \$0 to \$80,000 a year, there are a very few people (1%) who make millions. If you just averaged all the incomes, the mean income would be very high, like \$500,000, because the few who make a lot more make a whole lot more. Therefore, if you want a more reliable

and realistic way to look at the incomes of most people, you would use the **median**. The median (which, like the median in the road, means “middle”) is the income figure indicating that *exactly half the people make less than that income*. If half the people in the country make less than \$45,000, then that is a more realistic way to look at what most people make.

The way to get the median is to arrange all the scores in order, then find the exact middle score. For example, say you have the following group of 11 scores:

1, 3, 5, 7, 9, 11, 13, 15, 17, 89, 312.

Now just count over from the edge until you reach the middle score, in this case 11. The median score is 11. However, for this group of scores, the mean would be 44 (because there are two numbers which are way out of the range: 89 and 312). You can see why, in this case, the median score is a better representation of the middle than the mean.

In some statistics, the numbers 89 and 312 are called **outliers**; they are *uncharacteristic scores from the rest of the group*. Generally, if they are very uncharacteristic, you would throw them out of your sample (your set of scores). However, when you have only a few scores, as in this set, that’s tough to do because the sample we began with is small. So, the median score is a better way to represent the average.

### WHAT “SAMPLING” MEANS AND WHY IT IS IMPORTANT

Again, your **sample** is the students you are actually involving or testing in your research. **Sampling** is *how you choose those particular students*. In traditional research (but not in practitioner research), how you choose your sample is important, because you want to reduce the chances that there are students in your study who have some characteristic that you don’t know about that would influence how well they do. That is why some researchers and statisticians like **random sampling**. In random sampling, *any student has exactly the same probability of being in the study or in the experimental group as any other student*. In medicine, a random sample is obtained by identifying a whole group of patients or subjects and then literally randomly picking some to get the treatment and others not to. In education, you would randomly pick from a large group of students who all seem to be the same (say, all third graders), and those picked would be in the class with the new approach; the others are in the class with the old approach. In this way, researchers and statisticians think there is no chance that the students in the group who are exposed to the approach are in any way different from the students who don’t.

For that reason, letting people volunteer for the new approach is non-random, because there may be something about those who volunteer that is fundamentally different from those who don't volunteer; i.e., volunteers are more energetic, more interested in learning, have more free time, etc., and any of *these* factors (variables) may explain why this group has better scores, rather than the new approach.

However, this is generally not relevant to practitioner research, because the point of practitioner research is to understand what works in **your** classroom, and, of course, you are not going to randomly teach some students and not teach others. (For this reason, many people object to random assignment studies in education, because it seems ethically strange not to serve some students and to serve others. Others point out that it can be done in large-scale studies.) The point of practitioner research is for you to understand what works with those exact students, not to choose other students. For this reason, and the fact that very reliable quantitative data requires large numbers, some consider that qualitative data is the only option for practitioner research. However, test scores and other quantitative data are still useful for many practitioner research questions; you just have to understand the limitations with smaller number of scores (see the examples above).

## OTHER TERMS AND THEIR IMPORTANCE TO STATISTICS

A **correlation** is just *an association between one aspect and another* (your age on the one hand, and the fact that your score went up on the other).

A **variable** is *a factor that may influence or otherwise explain how well someone does* on a test or other measure, other than the approach they were exposed to. Common variables are age, gender, race, socio-economic status, class size, previous experience, etc.

**Generalizability** of the findings means that the *quantitative data are reliable enough that the findings can be **generalized** from the sample in the study to the whole population of like learners*. From a statistician's point of view, findings are strictly only generalizable when the sample was chosen randomly and when the number of students involved in the study is very high. These types of studies are rare, even in K-12, yet most researchers do state their implications as if they could be relevant to the larger population of students. This is why you typically see "limitations" sections in research reports, where they state what the sample was, so that readers can make a judgment of how generalizable the findings are to other students.

**SOME COMMONLY USED STATISTICAL ABBREVIATIONS:**

Now that you know what some of these concepts are, you may realize what some of the language is in the research reports that you read:

$X = 5$	The mean ( $X$ ) equals 5.
$P = .01$	The chance, or <b>probability</b> , that the difference between the means (the averages of two sets of scores) are different by accident is 1%.
$N = 25$	The number of students in the sample (or in that statistical test) was 25.
s.d. = 13	The standard deviation for that set of scores was 13.

The vast majority of statistics are **descriptive**, which means that they usually employ only *testing the difference in means and describing what the sample looked like*.

## General Recommendations for Writing Research Reports<sup>4</sup>

- Use an active voice—first person.
- Avoid jargon and acronyms. Use plain language and define terms.
- Be concise. Keep the briefs brief.
- Write to the headings.
- Use specific, clear, and concrete examples and quotes to substantiate findings and facts. Show -- illustrate your points -- don't tell.
- Titles of the research brief should be descriptive and specific, and reflect the inquiry. Like the first sentence in the Background section, the title should be catchy and grab the interest of the reader.
- Strive for a balance of narrative and bullets and examples and quotes. Use them all wisely. Bulleted statements should be concise.

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<sup>4</sup> The Virginia Adult Education Research Network, May 2000. Criteria for writing our research briefs:



## Preparing the One-Page Handout and the Poster

The one-page handout will be passed out as part of your presentation in Session Four. This handout should include the title of your research, your name (and contact information if you are willing to have people contact you about it) and then brief statements or bullets about the following:

- your teaching or program context
- your research question(s)
- your methodology – what you did, what data you collected, how you analyzed it
- your findings (and any conclusions)
- your next steps (what you plan to do to follow up on this project)

Send an electronic copy to your facilitator for copying by **[insert date]**.

In addition to giving a presentation, you will prepare a poster of your work. Your poster should include the information from your handout. In fact, you may want to increase the font and print out the various pieces and paste on a poster board. You may also want to include sample data, instructional materials, etc. Think “science fair.” Your facilitator will prepare a poster to introduce the display.

Two sample one-page handouts follow.



## One-Page Handout: Sample A

### WHAT HAPPENS TO FLUENCY SKILLS WHEN I TEACH DAILY, SYSTEMATIC PHONICS SKILLS?

Heather Turngren, ELL Teacher, Minneapolis Adult Basic Education

#### Research Context:

The research was conducted with two ELL classes, morning and evening, at a large Minneapolis ABE site. The students were high beginning, low intermediate Level 4A with CASAS scores ranging from 198-220. Students were Brazilian, Ecuadorian, Ethiopian, Somali, Mexican, Oromo, and Togolese immigrants and refugees. Most of the learners had the basics of decoding and generally could read well; however, many were not fluent readers. I believed that many lacked word analysis skills (vowel and consonant sounds, decoding, and syllabication) which resulted in difficulty in fluency and comprehension.

#### Research Question

What happens to fluency skills when I teach daily systematic phonics skills?

#### Methodology

Fifteen to twenty minutes of systematic phonics instruction was integrated into classes daily from March 15 to June 4, 2004. Phonics activities were created, beginning with long and short vowels, moving to vowel blends and then to troublesome consonant blends. Sentences were developed with many of the targeted words to help build fluency in addition to decoding practice. By the end of the study students were reading Great Leaps Sight Phrases.

Learners read two passages at the beginning and end of the study to measure improvement in fluency. One group read the same passage at the end of the study; another group read a different passage at the end.

#### Findings

1. The learners did not significantly improve, as a group, in fluency.
2. The group which read the same passage at the end of the study improved their fluency by an average of 2.84 words per minute.
3. The group which read the same passage improved their CASAS score an average of 4.83 points.

4. Years of previous education was positively related to both CASAS improvement and fluency improvement.
5. Total hours of instruction didn't have any relation to their fluency rates or post-CASAS scores.

### Next Steps

Because of positive feedback from learners and improved fluency and CASAS scores, I will continue systematic phonics instruction. I will have learners re-read texts in class to promote better fluency.

## One-Page Handout: Sample B

### SUSTAINED SILENT READING: DOES IT WORK IN ESL?

Jane Doe  
123-456-7890  
doe@whatever.net

**Research context:** I teach an ESL class two nights a week in a learning center in a rural county. I usually have 8-10 students, most of whom have had only a basic level of education. They are working at NRS levels 1 and 2 in English Language acquisition.

**Research question:** What happens when I use Sustained Silent Reading (SSR) in a beginning level ESL classroom?

**Research methods:** I collected a variety of reading materials – magazines, pamphlets, short story collections, poetry, songbooks, manuals, etc. Some were written for low-level adult readers, but most were not. I set aside twenty minutes each night for students to choose whatever they wanted from the collection to read. Then for 10 minutes they were to find a partner and discuss in English what they had read. I sometimes used a guiding question for this discussion. I did this for two months of a four-month term.

To try to determine the results of using SSR:

- I compared changes in CASAS reading scores made by this group with a similar group I had last year
- I compared attendance figures from the two groups
- I kept a list of what everyone read
- I observed and took notes on content and English usage in the post-reading discussion for each student in the first two weeks and the last two weeks of the SSR.

**Findings:** When I looked at CASAS scores and attendance records, I did not see much difference between the two groups. Everyone read at least three varieties of text, and five of the eight read more difficult materials by the end of the two months. In my observation of the discussions, everyone was better able to describe what they had read by the end of the two months. About half were making critical comments or inferences in their discussions. While I did not collect data on this, I observed that several students asked to take materials home to read. This increased to

the point that when we ended the SSR period, we set up a lending library that students continue to use.

**My next steps:** While I did not see any gain in tested reading ability in this group, I also did not see any decrease. What I did see is an increased interest and willingness to read English materials (and this after some initial resistance to the project.) I also observed use of more and more complex spoken English – I cannot say this was a result of the SSR, but I believe it may be. So I plan to try SSR again next year for the entire term, though maybe only for one night a week.