EDDATA II

Education Survey Course

Teacher's Guide

EdData II Technical and Managerial Assistance
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September 8, 2009

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Note: This PDF file does not include the handouts that were presented to trainees during the Education Survey Course in Monrovia in September 2009. Some handouts were book length, others are available publicly as USAID reports, and some were in draft form at the time of the training. Information about the handouts can be obtained by contacting RTI project staff through the EdData II website, https://www.eddataglobal.org/about/index.cfm. A May 2010 online version of the course, including training materials, is available from https://www.eddataglobal.org/courses/survey/index.cfm.

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EDUCATION SURVEY COURSE DOCUMENTS

1. Education Survey Course Agenda
2. Education Survey Course Trainer's Guide
3. Education Survey Course Participant Manual
4. Excel Exercises
    a. Worksheet Exercise 4.1
    b. Worksheet Exercises 5.1, 5.2, 5.3
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    e. Worksheet Exercises 11.1, 11.2, 11.3, 11.4, 11.5, 11.6
    f. Worksheet Exercises 12.2, 12.3, 12.4
    g. Worksheet Exercises 14.1, 14.2, 14.3, 14.4
5. Handouts:
    a. Handout 1: EGRA Liberia Baseline Assessment 2008 Report
    b. Handout 2: 2007 EFA Global Monitoring Report
    c. Handout 3A: DDSP Full Report
    d. Handout 3B: DDSP Summary
    e. Handout 4A: EGRA Liberia Student Instrument
    f. Handout 4B: EGRA Liberia Teacher Instrument
    g. Handout 4C: EGRA Liberia Principal Instrument
    h. Handout 5: Kenya Education Management Capacity Assessment (KEMACA) Report
    i. Handout 6: Ed Data II SSME tool for Classroom Observation
    j. Handout 7: Focus Group Results Report
    k. Handout 8A: Ethnographer Ami Vitale
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    m. Handout 8C: Ethnographer Ami Vitale
    n. Handout 9 : Harvard Business School Ethnography field exercises
    o. Handout 10: Evaluation of Big Mama's program

NOTE: The Participant Manual contains all Overheads that are referenced in the Trainer's Guide. In addition, it also contains two appendices, one on t-distributions and one on z-tables.

Introduction

Each session has the following layout:

PURPOSE Each Session begins with a brief purpose statement which tells the trainer why he or she is doing this Session and where the Session fits in with the overall design of the training program. Trainers might also want to use some of the comments here when they introduce the Session to participants.

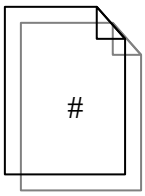
TIME This tells the trainer how long it would take to complete the session. Times may vary depending on the number and experience of participants, among other things.

OBJECTIVES This describes the learning objectives participants will achieve at the end of the session.

PREPARATIONS This describes things the trainer needs to do before the session.

DELIVERY This section leads the trainer step-by-step through the session and explains in detail what the trainer needs to say and do at each point in the session.

GRAPHICS



This symbol indicates when the trainer should display the overhead slide or use Excel exercises. The number (#) in this symbol is the overhead number for the module being discussed. This number corresponds to the numbered overhead in the Participant Manual or the Excel exercises.

SESSION 1: Introductions and Setting the goals for the Education Survey Course

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PURPOSE: The purpose of this session is for participants to get to know one another and get to know you, the facilitator, and for participants to familiarize themselves with the course goals, schedule, and logistics.

TIME: 1 hour.

OBJECTIVES: By the end of this session participants will

1. Have introduced themselves to the group as a whole
2. Have reviewed the course goals and schedule
3. Understand course logistics

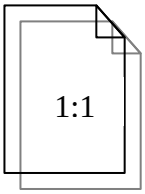
PREPARATION: For this session you will need to make any necessary adaptations to the course outline and daily schedule overheads. Once adaptations are made, make a course outline poster, from flipchart paper, for example, to keep up and refer to over the length of the course.

DELIVERY: **STEP 1:** (Opening Introductions, 5 min). As the course begins you will want to make any introductory and welcoming remarks. If you have invited any guests to the opening you can have them introduce themselves and welcome participants.

STEP 2: (Introductions, 5 min). Once introductory remarks and guests have spoken you can introduce yourself - the course facilitator(s).

STEP 3: (Introductions, 15 min). Now that you have introduced yourself, allow the course participants to introduce themselves. Go around the room and ask each person to say their name, where they work, the position they hold, what they hope to get out of this course on educational surveying, and what experience they have in survey research. Have people limit their introductions to 1 to 2 minutes and to focus on factual information about themselves. Ensure that each participant has a name tag.

STEP 4: (5 min) Discuss any logistics that are necessary and answer any questions that participants have about logistics.



STEP 5: (15 min) Go over the main goals of the course with participants. Refer to Overhead 1.1. Explain that the skills that participants will develop – those of designing and implementing surveys and those of analyzing and presenting findings for policy decisions – are focused on the education sector, and in particular on issues of early grade reading, but that they are the same skills and tools that researchers use in nearly any area of education or indeed other fields. Furthermore, the use of and focus on EGR experience contextualizes this course, it avoids theoretical examples, and as such ensures conceptual coherence and is more effective in explaining often complex concepts. Emphasize that this course is focused and developed around the goal of imparting skills and it is not linked to any

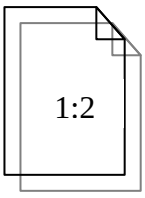
policy issue or change being undertaken in their districts. Nor are the data used meant to be real data! Data are used only as examples. No need to debate that some codes are incorrect or some data are incorrect. Data are used ONLY as examples!

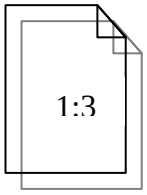
In discussion with participants, ask them why we need to conduct research in education? Draw a parallel in financing between health and education by providing an example of the Gates Foundation's funding in the health vs. education sector. Why is it that the Gates Foundation gives approximately 5 billion US dollars to research in the health sector and almost none to the education sector world wide (with the exception of 12 million US dollars given to Hewlett-Packard Foundation for education projects)? Or the Green Revolution and education. The Green Revolution was one of the most successful donor interventions, that was based on a lot of research.

Some of the answers could be:

a. In health , one can easily see a direct relationship between inputs and outputs;
b. Health has a better scientific basis than education; there has been more research, thus there has been more knowledge as to what works and what not;
c. Work in health is quantifiable (in terms of inputs) and the management part is known (there are standards on how to build a vaccination clinic). In other words, what works is well researched;
d. Outputs are visible and measurable in the health sector. In education we only have exams.

Once you explore various answers, mention that there has been some progress in the education sector as well. Since the Green Revolution, there has been a lot of research done on the relationship between education inputs and outputs. This course is a one step further in the direction of putting the education sector at an equal footing with the health sector.





STEP 6: (15 min) Review the course outline and daily schedule. Refer to Overheads 1.2 and 1.3. Go over the different sessions that make up the course and how they fit into the survey cycle as a whole. Then go over the daily schedule. This step is important in explaining how all the sessions fit together. The conceptual coherence of the course needs to be laid out at this point. Note that the agenda will vary from one country to another depending on what trainers have determined to be the most appropriate set of sessions that need to be taught. In Overhead 1.3 of the Participant Manual we provide a sample agenda that was used during one of our training sessions

After reviewing the outline and schedule ask participants if they have any questions about the content of the course. Repeat once again that the workshops is not about any particular issue in their district, but rather a tool for imparting skills on conducting education survey research.

SESSION 2: Defining the Research Question and Identifying the Appropriate Research Tool

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PURPOSE: The purpose of this session is for course participants to learn to define a research question and to identify the appropriate research tool for that question.

TIME: 4 hours.

OBJECTIVES: By the end of this session participants will:

1. Have identified critical research questions for their education districts
2. Know some of the main research tools for data collection

PREPARATION: There is no special preparation required for this session.

DELIVERY: **STEP 1:** (Introduction, 60 minutes)

Ask participants to brainstorm definitions of 'research'. What is it? Why do we do it? Write the words and phrases they come up with on the flipchart or board.

Then try to distill these ideas into a working **definition of research**. An example of a useful definition of research (applied research, actually) is:

Research is the process of gaining systematic and objective knowledge in order to solve questions and problems.

The two main ideas to highlight here are that it is a process of inquiry to learn about something in particular, and that it's goal is to help us solve problems or answer questions.

Explain that the second concept here, that research should be used to solve questions and problems, is actually the defining quality of **applied research**. **Basic research** is not geared toward solving a practical problem. In this course we will be focusing on applied research because it allows us to make policy and program decisions to improve schools, teaching, and learning. Basic research is more aimed generally at understanding the world, and the relationship between things or variables, without a practical problem at stake.

In education, a **basic research question** might be:
What factors contribute to student learning?

While an **applied research question** might be:
Knowing that positive relationships and adult-child interactions support student learning, do classrooms in Liberia have adequate positive adult-child interactions? Or, do the relationships observed elsewhere in the world apply in Liberia?

Point out that while the first question is not aimed at solving a problem, its findings do lend themselves to subsequent applied research questions, like the second. In this sense there is somewhat of a spectrum ranging from pure basic research to pure applied research, with many questions falling someplace in between those extremes.

Ask participants to think of other examples of both basic and applied research questions in education. Write these on the board/flipchart.

When we talk about research, the first thing that comes to our mind is a common classification of research into qualitative and quantitative research. Qualitative research investigates why and how of decision making while quantitative research compares what, where and when. Qualitative research categorizes data into patters as the primary basis for organizing and reporting results. On the other hand quantitative research relies on the analysis of quantifiable data.

Qualitative research typically answers questions related to "how" issues, and typically in ways that cannot be put into numbers very easily.

Non-education examples: What are the management practices of Liberia's most successful rice farmers? How much fertilizer do they use? What kinds of labor relations do they have?

Education examples: What are the management practices of Liberia's most successful head teachers? How do they treat their teachers? How do they relate to the District staff? To the parents?

Facilitator: list other examples if necessary such as mother tongue instruction, parental wealth, what materials are better with what children, etc.

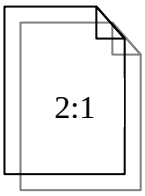
Quantitative research uses numbers to answer questions that can be posed in terms of numbers. It answers questions related to how much, or why, in numerical terms. *Facilitator: Emphasize that we will be focusing on applied quantitative research.*

Non-education examples: How many shoes does Liberia produce per year? How many tons of rice? How much fertilizer do Liberian farmers use? (Those are purely descriptive.) How much more maize could be produced if Liberian farmers used 10% more fertilizer?

Education examples: What is the average performance of Liberian schools? (Descriptive) How higher would the results be if the school year was 10% longer?

These are simplifications, of course. For example, some "how" questions do have numerical answers. And quantitative and qualitative research techniques are often applied in the same project.

STEP 2: (Lecture, 20 minutes). Explain to course participants that because answering questions and solving particular problems is so fundamental to research, the first step in any research project is to figure out what your **research question** is.



Refer to Overhead 2.1. Any subject can be researched, but only a few questions about those subjects make good research questions. For a question to be a good research question it should:

- Provide new, useful information (i.e. not be something to which we already know the answer or that won't be of any use to us)
- Be answerable (i.e. not depend on *only* people's beliefs and values)

Keep in mind though that what might seem a useless research question to you, might be a very important research question to someone else.

Ask participants if they can tell you which of the following pairs of questions would make a good research question and why.

What are the most effective methods for teaching reading in Kenya?
Would Kenyan children learn reading better if they were all sent to schools in England?
(Here they should answer that the first question is a better research question because it is more useful. The second question is not a realistic option for teaching reading.)

Should patriotism be taught in school?
Do parents and students believe that patriotism should be taught in school?
(Here they should identify that the second question is a better research question because it is not based on personal values)

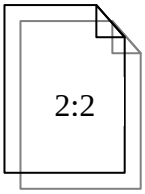
STEP 3: (Activity, 45 minutes). Have participants pair off with a person near them and come up with 2-4 research questions they think are important for their county or country. Have them keep the following questions in mind as they think of their research questions:

- What are the main challenges or problems the district faces in terms of education?
- Are there are problems with student learning?
- How did you come to conclude that these are the real problems?
- How do you know which problems are worse than others?
- Have there been any recent interventions to resolve district problems?
- What research has been done already and doesn't need to be investigated anymore?
- Is there any research that could be an important follow-up to preexisting research?
- Have there been any interventions done with respect to the problems you identified?
- Do you know and how do you know have these interventions worked out or not?

Tell them that their research questions can be questions aimed at establishing baselines or monitoring problems or solutions. Remind them that their questions should provide new, useful information and be answerable

Discussion for 15 minutes.

When they are done, have one person read aloud to the class one of the research questions they developed that they think is particularly relevant for their district. Record these questions on the board (or computer) and reflect on whether they are good research questions (in terms of providing new, useful information and being answerable). If any of the questions do not follow the guidelines of a good research question, identify the problem and work to adapt it so that it is a good research question. Also identify whether questions are baseline or monitoring questions.



STEP 4: (Lecture, 30 minutes) Explain that research questions are generally aimed at one of three kinds of research: **baseline**, **monitoring** or **evaluating**. Refer to Overhead 2.2.

Baseline research is research where you want to find out about an existing issue in your district, say the prevalence of teacher absenteeism, how well kids are reading, or whether students feel safe attending school. Baseline research is aimed at providing information on a potential problem *prior* to implementing any interventions or policies to improve the problem. Baseline information helps you understand how big the problem is and perhaps also some of the reasons behind the problem. An example of baseline research is provided in Handout 1: EGRA Liberia Baseline Assessment 2008 Report

Monitoring research is routine collection of information, usually on the progress of a problem or an intervention. Examples of monitoring research would be biannual measurement of whether teachers are using new reading textbooks in the classroom, or regular measurement of how well students are reading. Monitoring is usually done multiple times to monitor the progress toward some goal or target. An example of monitoring research is provided in Handout 2: 2007 EFA Global Monitoring Report.
(http://www.unesco.org/education/GMR/2007/Full_report.pdf)

Evaluation research is research that rigorously investigates the effect of something. As with monitoring, evaluations can focus both on problems and solutions. So evaluation research questions tend to be something like: What is the impact of HIV/AIDS on student enrollment? Or what has been the impact of the teacher trainings we offered on student reading and comprehension? An example of an evaluation report is given in Handout 3A: DDSP Full Report and Handout 3B: DDSP Summary, which is an evaluation of the District Development Support Program (DDSP), RTI's education project in South Africa.

Explain to participants that this course focuses on baseline and monitoring research, but not on evaluation because evaluation techniques are quite advanced and time-consuming. Emphasize that during this workshop will be focusing on applied, quantitative research and on monitoring techniques. Make sure that you also mention that this workshop is aimed at imparting skills and, although drawing knowledge from the projects that have already been conducted with which they area familiar, is not linked to any real-life project for which their contribution is needed.

2:3

STEP 5: (50 minutes) Remind participants that this course is on survey research. It focuses on two related research tools: questionnaires and assessments. You will now review what questionnaires and assessments are as well as some of the other main tools researchers use. Refer to Overhead 2.3. Before describing each of these tools, refer the participants to their handouts and tell them that they have examples provided, but that we will not have time to look at each in detail. Rather, they can take a look at these examples on their own.

A. **Survey research.** Surveys are one of the most commonly used tools for collecting primary data. Generally, surveys refer to a set of questions asked of individuals regarding the subject that is being studied. (Refer to the EGRA Liberia Survey Instruments available in Handout 4A: EGRA Liberia Student

> Ask course participants to give examples from their lives of surveys they have completed or that they have come in contact with. Write up their responses and discuss what kinds of surveys they are, if possible, in terms of the examples below.

Instrument, Handout 4B: EGRA Liberia Teacher Instrument and Handout 4C: EGRA Liberia Principal Instrument)

2:4

Explain that in this course we are going to look at three different kinds of survey tools that are frequently used in educational research. Refer to Overhead 2.4.

a. The first are **interviews**. Interviews are face-to-face meetings where a researcher asks a set of questions to an individual. The individual could be anyone, a student, a teacher, a school director, a parent, a school board member. (Refer to Handouts 4A, 4B and 4C.)

b. The second are **observational surveys**. In this type of survey a researcher him or herself answers a set of questions by observing in the setting under study. (Refer to Handout 6: EdData II SSME Tool for Classroom Observation)

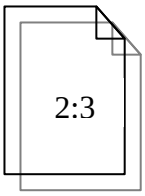
Point participants to Handout 6, and explain the SSME tool for Classroom Observation. Also ask for any other examples participants may have encountered. Examples can include survey counting and categorizing student-teacher interactions in a set period of time or recording the kinds and quantity of materials available in the classroom.

c. The third form of survey research that we will be looking at in this course is **student assessments**. Student assessments are tests administered to students to assess their skills or knowledge in terms of the subject of the study. In this course, we are going to be looking at student reading assessments, for example. Student assessments are not a traditional form of survey, but they have many of the same characteristics as traditional survey research. Show the EGR tools as an example of student assessments. (Refer to the EGRA Liberia Assessments in Handouts 4A, 4B and 4C)

Surveys can be administered by a researcher or research assistant, they can be conducted by telephone, or they can be self-administered (this is where the person responding to the survey does so him or herself on paper or by computer). Surveys administered by a researcher or assistant are generally considered to give the best quality information and also to have the highest response rate. But face-to-face administration of surveys is also more expensive than phone or self-administered surveys, particularly if a lot of travel is required to administer the surveys.

Ask participants why surveys conducted in person might give better quality information and have a higher response rate.

Explain that when conducted in person, the researcher can explain anything that is confusing, can motivate the person to participate in the survey, can keep the person engaged and interested in the questions, etc. Explain the importance of a researcher-administered approach when there is observation and judgment involved, because the researcher can be trained to be a consistent and objective observer. This is particularly important when there may be incentives to misrepresent responses.



B. Other research methods. Explain that while this course will look specifically at surveys, there are a number of other common research methods. Refer to Overhead 2.3.

a. **Focus Groups**. In focus group research, researchers convene meetings in which a group of individuals discuss the research topic. A focus group could involve bringing teachers together from one school or one district to discuss what methods they are using to teach reading, what they believe would improve their students' reading, or what are the barriers to children learning to read. Focus groups provide qualitative, rather than quantitative data. Focus groups generally are useful to learn about people's ideas about or experiences with the research topic, or to gather

ideas about how to improve a certain process. (Refer to Handout 7: Focus Group Results Report).

b. **Experiments**. Experiments are the most rigorous form of quantitative research and are designed to measure the impact of a particular thing. In experiments, researchers assign individuals (persons or schools) to either receive or not receive a particular 'treatment'. The assignment is at random, ideally. The experiment then tracks these two groups over time to see if people who receive the treatment are improving in a systematically different way, and in a statistically meaningful way (not by chance) than the people who don't receive the treatment. It is important to assign people at random so that they are not special in some way that might make the treatment work better than the treatment would work on an average person. (*Facilitator: describe how placebo is used in medicine for double-blind experiments. It is not just randomness but placebo)* Experiments are a useful tool when you want to learn very specifically about the impact of a certain intervention on people. For example, do students in classes where teachers have them read aloud for one minute a day learn to read better and faster than students in classrooms that do not do this? Are students who are taught about HIV/AIDS and HIV/AIDS prevention less likely to become infected than those who were not taught these subjects? Our EGRA project in Liberia is an experiment (not a random assignment though, but rather cluster sample) by which the performance in 60 control and 60 treatment schools will be measured over the course of two years. The focus of this experiment is to determine the impact of remedial interventions on student reading performance in 60 treatment schools. (Refer to Handout 1; Liberia EGRA Baseline Assessment 2008 Report)

c. **Ethnography and case study methods**. These are forms of qualitative research. Ethnography is an intensive qualitative research method where a researcher spends an extended period of time studying and learning about a particular object of study, for example a classroom, or school, or neighborhood. Ethnography is a good tool for learning deeply about a particular case. Ethnography is not designed to provide information about the general population; rather it provides very detailed and holistic information about a particular case. In order to fully understand her subjects, ethnographers might spend months living with them until they get all the information they need.

Another good example is the use of case studies by the Business School, the best business school in the world according to many, where students are taught business management mostly by studying real life management problems and how they were solved.

(Refer to Handouts 8A, 8B and 8C: Ethnographer Ami Vitale and Handout 9: Harvard Business School Ethnography field exercises)

STEP 6: (Activity, 30 minutes). Tell participants that now that they have a sense of what surveys are and what other research tools exist, you are going to ask them to return to their research questions they developed in pairs and to think about what research tool might be appropriate for each question. Have them return to their pairs and discuss what research tool they would use to study each question. They should spend 15 minutes on this at most. Let them know that there is not necessarily one 'right' answer to this question, but rather the appropriate research tool depends on what kind of information they want to get, how much time and money they have to answer the question, and other such factors. Go over a couple of examples with them before they turn to work in pairs (see the text box below)

Example 1: Let's take the research question: "How well are our second grade students reading?" Ask participants what research tool they would choose for this question: survey, focus group, experiment, or ethnography, and if a survey would it be an interview, an observational survey, or a student assessment. Discuss participants' responses. The most appropriate tool for this question would probably be student assessments.

Example 2: "How do teachers feel about the recent rural teacher bonus implemented in our district?" Again, discuss students' responses. The most appropriate tool for this question might be focus groups, where teachers can openly discuss their feelings about the bonus, followed by a survey. The focus groups might allow nuanced, in-depth understanding, the survey might allow for numbers to be generated about the opinions. The focus groups help us understand the opinions.

Explain that you can combine tools. A focus group is a good supplement to a survey. Or you might do a focus group first, to design your survey.

Give pairs 15 minutes to come up with a chosen research tool for each of their research questions and to be able to discuss why they chose that method over others.

Allow 15 minutes for all of the pairs to present the tools that they chose. Identify reasons why you agree or disagree with their choice in methods. If you disagree propose another method and explain why you think that one might be better.

STEP 7: (15 minutes, Review). End the class by answering any questions participants may have about the material covered this session.

SESSION 3: Planning a Survey & Overview of the Research Cycle

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PURPOSE: The purpose of this session is for course participants to learn the key steps involved in the research cycle and to understand the importance of advance planning of the whole research process.

TIME: 2 hours

OBJECTIVES: By the end of this session participants will:

1. Know the steps of the research cycle
2. Have identified the things that need to be planned for within each step
3. Explain the budgetary implications of each step in the survey and review the budget template

PREPARATION: There is no special preparation necessary for this session.

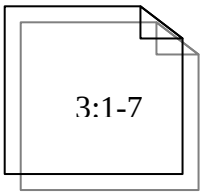
DELIVERY: **STEP 1:** (Lecture + Discussion – 60 minutes). Tell course participants that now that they know how to develop appropriate research questions and choose appropriate research tools you are going to look at the 'research cycle'. Refer to Overheads 3.1 to 3.7. Go through the stages of the research cycle with them. Make the presentation as interactive as possible. It is more than likely that some of the participants will know some of the aspects presented below.

> Ask participants why planning out the survey in advance is critical. Also ask what they think might need to be planned. Make sure that issues come up like budget, resources, time, individual steps, and who will be responsible for each step.

3:1-7

Survey Steps	Notes for the Facilitator
1. Before you begin ➢ Identify research objectives ➢ Define research questions ➢ Identify final indicators you want to know ➢ Consult the relevant stakeholders	**Define the research question:** the first step in the research cycle is to define your research question. It should be useful in providing new information and it should be answerable.
2. Pilot the instruments: ➢ Identify and train the assessors ➢ Identify the site where instruments will be piloted and arrange for the visit	**Design and pilot the instruments:** decide how to answer the research question (review options above) and what sorts of "instruments" are needed; once the instruments have been designed, they need to be piloted in order to determine if they are designed appropriately, time needed for their administration, and other logistical issues.
3. Collect data ➢ Establish data collection procedures and data quality control	**Collect data:** Data collection involves deciding what data to collect, how, from where, and how much of it.

mechanisms ➢ Train interviewers ➢ Conduct pilot ➢ Draw random sample ➢ Conduct and monitor fieldwork	
4. Process data ➢ Check data for data quality problems ➢ Check data entry form ➢ Train data processors ➢ Enter data	**Process data:** Processing data involves bringing together all the collected data and ensuring that it is of good quality.
5. Analyze and Present findings ➢ Plan where to present findings ➢ Plan who to present findings to ➢ Plan how to present findings (presentations, meetings, publication…)	**Analyze data:** Analyzing data is the step in which you use the data to answer your research question, frequently by converting raw data into indicators. **Present findings:** Presenting your findings is a critical step in the research cycle. This is when you share what you've learned with the relevant people in a clear and understandable way.
6. Use findings ➢ Plan how to use findings, what sorts of The policies, programs, or changes do you think could come about from this research?	**Using findings:** Using your findings is perhaps the most important step in the process. This is where you take your findings and make decisions and take actions that respond to the problem or situation you researched



STEP 2: (40 minutes) Budgetary implications + Budget template overview. Now that you have reviewed many of the individual steps that need to be planned, brainstorm with participants about resources and time. Emphasize that the data collection process is generally the one that requires the most time, money, and human resources. Data analysis requires a skilled individual or individuals to conduct the analysis and presenting findings can require significant resources particularly if findings are published or meetings or conferences convened.

Budget development: as already mentioned, funding for conducting surveys is almost never sufficient. Having recognized this, it is important that a realistic budget is developed. In this session we will discuss a prototype of a budget that will cost out the steps below. (*Facilitator: make the presentation as interactive as possible. It is more than likely that some of the participants will know some of the aspects presented below.)*

Survey Steps	Budgetary Implications
Before you begin ➢ Identify research objectives ➢ Define research questions ➢ Identify final indicators you want to know ➢ Consult the relevant stakeholders	➢ Even if we have a good idea that our research question is well defined, it is important that this research question is discussed and validated by the most relevant stakeholders. This not only ensures support for your research, but also provides you with an opportunity to make sure that your research question is what the stakeholders want and need and deem important. It also marks the beginning of your advocacy efforts. This step will either involve meetings with various stakeholders or a workshop, both of which need to be included in the budget. ➢ As it will be mentioned later in the course, this is the first step to ensuring the content validity of your research instruments.
Pilot the instruments: ➢ Identify and train the assessors ➢ Identify the site where instruments will be piloted and arrange for the visit	➢ Design of survey instruments is the most critical step for a number of reasons. One must involve relevant stakeholders in the design of questions (for the points mentioned above under A.), and your data will be as good as your questions are. The step also require resources. ➢ Piloting of instruments: usually involves cost for printing out instruments, arranging travel to the site where instrument will be tested, and the time of those who are piloting the instruments. Funding for this step must be ensured since it provides important information not only about the content but also other aspects such as how long does it take to administer the instrument, what are some potential logistical issues, etc.
Collect data ➢ Establish data collection procedures and data quality control mechanisms ➢ Train interviewers ➢ Conduct pilot ➢ Draw random sample ➢ Conduct and monitor fieldwork	➢ **Time-consuming.** (Both the questionnaire and data entry form and the collection of data itself.) ➢ **Can be costly**. Training costs of research assistants (enumerators), paying enumerators, transportation costs to get to schools, costs of reproducing questionnaires/assessments and any other materials needed (calculators, tape recorders, pens, etc). ➢ **Requires human resources**. Often university students can be hired as enumerators on a short-term basis.
Process data	➢ **Requires human resources:** Not as many

➢ Check data for data quality problems ➢ Check data entry form ➢ Train data processors ➢ Enter data	as in data collection but requires trained, capable person. ➢ Depending on the size of the survey data processing and cleaning can take some time. How would you calculate?
Analyze and Present findings ➢ Plan where to present findings ➢ Plan who to present findings to ➢ Plan how to present findings (presentations, meetings, publication…)	➢ Requires skilled human resources. This is the step that requires the most skilled individual(s). ➢ This step can also be time-consuming depending on the length of the survey and the number and complexity of the research questions. Requires financial resources. Publication costs, transportation costs for presentations, costs of organizing conferences, meetings, or seminars to discuss findings.
Use findings ➢ Plan how to use findings, what sorts of policies, programs, or changes do you think could come about from this research?	➢ The use of findings, for example in designing and implementing initiatives, generally comes from a separate budget. But don't forget that research findings that aren't put to use are wasted.

SESSION 4: Random Sampling

PURPOSE: The purpose of this session is to introduce the concept of sampling as a survey technique, to demonstrate how it is done and how it works. One of the problems in education is that sampling is not used as much as it should and in the way it should.

TIME: 2 hours.

OBJECTIVES: By the end of this session participants should

- Understand the difference between census and sample approaches to collecting information.
- Be able to describe the benefits of sampling and why sampling should be random.

PREPARATION: 1. Prepare one opaque bag of beads with 10 white and 10 yellow beads and 40 blue and 40 red beads for every two course participants and one for yourself. Make sure that the beads feel the same). (Blue=male reader; red=female reader) (white=male non-reader; yellow=female non-reader).

Ahead of time, take flipchart paper and write the explanations for different colors on it and make it visible for everyone. Ahead of time, create a results sheet on which the samples drawn will be recorded.

DELIVERY: **STEP 1:** (Lecture; 45 minutes). Explain to class participants that there is more than one way to gather the information you need to answer your research question.

Explain the difference between census and sample. If your research question is 'Are second grade children reading 45 words per minute in Liberia?' you could go to every second grade student and test their reading. We call this a **census:** we obtain information from the entire population of interest. But this would take a tremendous amount of time, effort, and money.

Politicians often insist on getting the census rather than a sample. One may ask why politicians insist on having a census instead of working with a sample. The reason for that is that they want to be close to finding that true value of, for instance, how many correct words read per minute are second graders in Liberia reading on average. Yet, they are forgetting that the ultimate true value cannot be found for a number of reasons. A child that was tested today may be absent tomorrow, which will skew that supposed 'true value'. Or they may read less well tomorrow. Maybe some are sick one day, others are sick another day. Or the weather changes. There is not really a "true" value no matter what. At the same time, censuses tends to be expensive and politicians need to understand that working with a representative sample (that we'll talk about in subsequent sessions) is nearly as good as conducting a census, yet much less costly. If politicians need a census because they want to know what exactly is going on in each single jurisdiction, then that may be justified.

Refer to Excel Exercise 4.1. Here we can do a rough calculation of how much time and money it would cost to conduct a census versus a sample. These are hypothetical numbers. For example, if we would like to determine the reading level of Liberia's second graders in 107 schools by looking at 120 students per each school (which is the average number of second graders across Lofa county), the cost of this effort per school would be:$ 98,453. The total for all 107 schools would be:

107 schools x $ 98,453= $ 10,534,418

The cost per school must include the following: design of the survey, training of the field enumerators, production of materials, training of the assessors, personnel cost (assessors, data clerks, drivers, supervisor time, management time)

(*Note: This example assumes that we are using paid assessors. However, if we choose to use teachers or district officials to collect data, the cash cost will be much smaller, close to 58% ($ 6,111,038) of the cost calculated above. We will illustrate this by looking at our example in the budget spreadsheet.*
But note the difference between real costs and cash costs. If one uses government officials, who are already paid, the cash cost is low. But since the officials could have been doing something else, there is still a real cost.

Another way to get a good sense of whether second graders are reading 45 correct words per minute is to take a random sample of second graders and test their reading. A **sample** is a set of data drawn from the larger population that we believe represents the population. The **population** for this research question would be all the second graders in Liberia. A sample is a group of only *some* of the second graders in Liberia district. But because we are interested in learning about the reading level of all Liberian second graders we need to be sure that the sample we choose is **representative** of the entire population of second graders. For example, we wouldn't want to test the reading of just the smartest or best nourished or richest second graders if we wanted to learn about the reading level of **all** second graders. Or for that matter the poorest. A sample must therefore be representative. This would give us the wrong idea about reading ability.

Finish by saying that everything in our life is a sample. There is no such a thing as a true picture. The best way to exemplify this is to look at Education Management Information Systems (EMIS). EMIS has been designed with the objective to provide accurate and timely information to decision-makers. Nevertheless, reported enrollment on dates that are two weeks apart might be different for simple reason. A child that was sick on date one will be in school on date two which will drive the enrollment up. And so on.

Random sampling is a technique which allows us to be pretty sure that we have selected a representative sample that can give us good information about the population as a whole. Random sampling means that every observation in the population, in this case that means every second grader in Liberia, has an chance of being chosen for the sample that is equal to their proportion in the population. Thus, a random sample will, for example, consist of the same proportion of boys and

girls, readers and non-readers, as are in the population. Emphasize the main idea behind random sampling:

> Random sampling allows us to measure the ‘few’ to describe the ‘whole’, because people’s chances of being drawn into the sample are equivalent to their proportion in the population.

Furthermore, not only does random sampling allow us to be certain that we have selected a representative sample; it also reduces the cost of the research effort. Lets refer back to Excel Exercise 4.1 to go over census versus sampling costs. As you can see, when we survey 40 randomly selected schools and 20 randomly selected students within each school (for a sum total of 800 students), the cost per school in this case would be: $32,818

The cost for conducting the census with paid assessors is $10,534,418 while the cost of the census without paid assessors is $6,111,038. On the other hand, when we work with a sample, the costs are $1,312,700 with paid assessors and $761,500 without paid assessors. Hence by working with a sample, we save $9,221,718, when paid assessors are used, and $5,349,538 when paid assessors are not used. And yet we get almost the same survey results in a sample as if we conducted a census.

In the calculations done so far, the cost of labor has been included. This aspect is often forgotten, yet is perhaps one of the most expensive items in the budget. For instance, if we take out management time allocated to this survey exercise (usually spent on the survey design, survey implementation supervision and report writing), the total cost of surveying 40 schools would be $802,700, which is significantly lower than the real cost of the survey. Given that this same time could have been spent on the next best thing (opportunity cost), it is important to cost it and include into budget projections.

Also, the calculations include paid assessors whose time and skills tend to be expensive. If we rely upon existing infrastructure, such as using teachers or district officers for data collection, then the cost would be significantly lower. Without their cost, the sample would cost $761,500, thus rendering us a savings of $551,200 on the sample. However, one should note that even if district officials and teachers are working as part of their duties, the use of their time has a true or real cost (opportunity cost).

An additional note, samples start to get expensive, if we sub-sample a lot. For example if we look at a sample of 500 students, and now want to further analyze gender and incomes within that, each further stratification will need an additional 500 students to be added to the original sample of 500 students.

STEP 2: (30 minutes) (Demonstration). Demonstrate random sampling.

A. Show course participants a bag of beads. Tell them that this bag represents all of the second graders in Malindi. Blue/red beads represent those second graders that can read at least 45 words per minute (blue=male, and red=female) and white/yellow beads represent those second graders that can not read 45 words per minute (white=male; yellow=female). Don't mention to the participants how many beads are there until the very end of this exercise (thus, when you start explaining 80:20 proportion).

B. Explain how we can learn how many or what percentage of second graders can read 45 words per minute. One way would be to count all of the beads in the bag. Another way is to take a random sample of beads in the bag.

C. Shake the bag and ask a volunteer to take out 20 beads. Have the volunteer count the beads that are white and yellow (white=male; yellow=female) and then beans that are blue and red (blue=male, and red=female) and record this on the board or flip chart.

D. Ask participants if, given the information they have from the sample, they think that most, few or somewhere in between most and few second graders in Liberia can read 45 words per minute. They should answer that somewhere in between most and few second graders reach the benchmark.

E. Ask a new volunteer to count the remaining beads in the bag. Add these to the numbers counted in the sample and ask the class if the sample correctly describes the contents of the full bag. The answer should be yes, random sampling allowed us to more or less measure a few beads in order to learn about all the beads in the bag.

STEP 3: (Exercise: 40 minutes). Have the class repeat the previous exercise themselves in teams of two and allow at most half an hour for this exercise.

A. Divide the course participants up into teams of two. Give each team a bag of beads.

B. Of all teams, select two that will **not** shake their bags at all. Prepare their bags ahead of time and ensure that 20 blue/red beads representing second grade readers are on the top of the bag, while 20 white/ yellow beads representing second grade non-readers are at the bottom of the bag. Instruct the two teams to draw a sample of 20 from the surface (thus, without digging deep into the bag). These two teams will be doing non-random sampling; don't tell the teams that they are actually doing the non-random sampling here, just have them record their results.

C. The remaining teams should mix the bags and explain that mixing the bags represents ensuring that each sample is random. Have one person in the team reach in and take out 20 beads and count the white/yellow beads and the blue/red beads.

The second person should check the other's work and record the findings. Then have the first person return all 20 beads to the bag and have the second person re-shake the bag and draw another sample of 20 from the bag, and count the white/yellow beads and the blue/red while the first person checks and records.

D. When all teams have finished call for a volunteer to record each team's findings on the board. Have the participants record the sample findings and then the census findings. Reveal that the ratio is 80:20. Ask the class if most of the experiments worked? How close were the sample findings from the real 80:20 ratio? How much did the findings from the different experiments vary? Were any of the samples *totally* not representative of the population as a whole? Explain that samples are not always correct. There is always the chance that your sample will not be representative but we can do things that can minimize that chance (say by making sure our sample is the right size) and we can be sure that we understand how big that chance is (by calculating the chance of error). Also, ask why these two teams had different results? Use this question to explain differences between non-random and random sampling. Finally, ask them whether they got about the same numbers of boys and girls in the sample. Why? How important is it, then, when random sampling, to pre-select by gender? What if you wanted to pre-select for a characteristic that is very rare? Or to ensure gender analysis in a university course on theoretical physics, where females may be very rare?

STEP 4: (Review: 5 minutes). Review the main points of this session.

What is a sample? A random sample? A census?

Why is *sampling* important? What does it allow us to do?

Why is *random* sampling important? What does it allow us to do?

What are the dangers of non-random sampling? What are the disadvantages of censuses?

SESSION 5 – Selecting the Sample

PURPOSE: The purpose of this session is to teach participants how to choose an appropriate random sample. This session will cover how to identify the appropriate sampling unit, how to get or make a sampling frame, designing the sampling procedure, determining the size of the sample, and actually going through the steps of selecting your sample.

TIME: 3 hours

OBJECTIVES: By the end of this session, participants will:

- Know what a sampling unit is
- Understand intuitively how sample size is determined and have reviewed a list of common parameters and suggested sample sizes for those parameters
- Have reviewed and corrected a model sampling frame and understand the main problems that can be present in sampling frames
- Have used a sampling frame to identify a random sample for a study

DELIVERY: **STEP 1: (5 minutes,** Introduction): Let participants know that the goal of this session is to learn how to select a sample. Remind participants that…

Random sampling allows us to measure the 'few' to describe the 'whole'.

and explain the objectives of this session.

STEP 2: (Lecture: 30 minutes). Here, you will briefly go over the importance of thinking about a **sampling unit**. Explain that the unit of analysis refers to the individuals or things that will be under analysis in a study.

> Ask the group that if they were going to lead a study of fluency, namely how many words a second grader could read in a minute, would their study focus on students or on teachers. They should answer that it would focus on students. Students would be the logical unit of analysis for this study. Then ask them if they wanted to research what the average class size is in Liberia, would their analysis focus on students or on classrooms? Here they should respond that it would focus on classrooms. The classroom is the appropriate unit of analysis for a study of class size. What if they wanted to research principal leadership skills, what would the appropriate unit of analysis be?

Let the participants know that sometimes there may be more than one possible unit of analysis. For example a study that looked at student assessment may also involve asking principals about certain aspects of reading practices in their schools.

Ask participants if they think they would end up with the same information in each of these cases. If not, why not? Ask them what unit would be the best unit of analysis on, let's say, teacher absenteeism and why. Explain to them that the answer to this question probably depends on the kind of information they wanted to get. The principal may be the best unit of analysis.

While teachers know their own absenteeism best, they might not respond honestly because they are afraid they will be judged poorly or risk losing their job. Depending on their age, students might not be able to accurately report their teachers' absenteeism and they too might misreport because they are worried about being punished by their teachers. Principals might feel less pressure to misreport than the other two groups, but they might not know specific teacher's attendance or they might feel bad reporting high absenteeism.
(*Facilitator: spend half an hour at most on this discussion all this discussion.)*

For sensitive subjects like teacher absenteeism some surveys report multiple stakeholders' responses. So a survey might indeed ask all three groups – teachers, students, and principals – about teacher attendance. When you try to collect the same information for different sources or in different ways this is called **triangulation**.

STEP 3: (Lecture, 1 hour). Here, you are going to talk with the class about **sample size**. Remind participants that in the last session they learned that you can use a sample to get good information about the entire population without having to collect data about each observation (student in this case). But how do you know what size sample to choose? If they had chosen just one bead out of the bag last session, would that have been enough to know about all the beads? What about if they had chosen 5, or 10, or 20? How do we know how many individuals we have to survey in order to have reliable information about the whole group that we are interested in?

Explain to participants that, as they might imagine, the larger the size of the sample, the surer we can be that the sample reliably represents the population as a whole. On the other hand, the larger the sample size the more time, effort, and resources required up to the point where you end up with a census (as we have seen in the previous example of resources calculation). How do we decide how big of a sample to research? This depends in part on how much time and resources we have.

Give them an example to illustrate the relationship between sample size and variation. Say we want to know about how much a typical man in Liberia weighs. First, imagine a situation in which Liberia is a country where every man weighs about the same amount. Everyone eats about the same amount of food, works pretty hard, and is generally pretty fit and lean. If almost every man in Liberia weighs about the same and we take a small sample of 5 men, we are probably going to be able to accurately calculate about how much men weigh in the district. Because nearly every man weighs the same amount, we could

choose almost any group of 5 men and have a fairly good sense of men's weight. In fact, if every man in Liberia weighs exactly the same amount we could take a sample of 1 and still have a good sense of what men weigh.

Now imagine that in Liberian men weigh very different amounts. There are some men who are very fat, eat a ton and never work. There are other men who are very fit and lean. And then there are men who are very thin for various reasons. If we were to take a small sample of 5 men we may have a tough time figuring out how much a typical man weighs. With only 5 men in our sample we might end up with purely by chance with 4 very fat men and one lean man. From these findings we might guess that nearly all men in Liberia are very fat. Or we might end up with 3 thin men, 2 lean men, and 1 fat man and we might guess that most men are very thin and lean. If men in Liberia weigh very different amounts, that means there is wide **variation** in what men weigh. Then we certainly can not use a sample size of 1, or of 5, we would need a larger sample to get an accurate and reliable sense of what men weigh.

Do another example if needed.

Introduce terminology:

Average = mean

Population: the total population, it has a "true" average weight, that is called a "parameter" or a "population parameter." The population average or mean is called a parameter.

Sample: the portion of the population you are selecting in order to "represent" the population; you are using the sample to "infer" about the population; the average weight in the sample is called the sample average or sample mean; it is used to infer what the population mean is. It is called an *estimate or a statistic*. The sample mean is an *estimate* of the population mean.

Go over another example if need be. Spend some time exercising these ideas!

Tell participants that now that you have given them this example, you are going to explain the factors that help us decide how many individuals are to be included in our sample.

Another important preliminary point to make is this.

The estimates that we get from sample will never be exactly what we would get in the population. As already mentioned above, the larger the sample the closer we will get to the true, population average. And, of course, the sample had to be representative, namely, a proper random sample of the actual population. An example of a poor sample might be as follows. Suppose poor children do not come to school towards the end of the month, because their families tend to run out of money towards the end of the month. Poor children will typically not

5:1

read as well as richer children. Let's say that we do a reading assessment on the 25th day of the month. Will that be a representative sample? Perhaps not. We would not get a good picture of the true average.

Explain that there is an equation for determining how large the sample should be, but basically the sample size depends on just three factors. Refer to Overhead 5.1.

- First, it depends on how confident we want to be. That is, on a) how **precise** we want our findings to be and how b) **sure** we want to be that the findings from our sample represent the population as a whole. The more precise we want our findings, and the more confident we wish to be that they represent the whole population, the larger the sample size we need.
    - We want to make statements such as: "Based on our sample or estimate of the P/T ratio, we are 95% sure that the underlying population mean is between 34.2 and 37.1. The "95% sure" is what measures how **sure** we are, and it is called our "confidence level." The business about "between 34.2 and 37.1" is called the "confidence interval" and it expresses how **precise** our estimate is.

- Second, it depends on how much **variation** there is in the thing we are researching. For example if we want to know how many words second graders can read in one minute we can guess that while some second graders can read almost no words per minute other second graders can read a whole page of words in a minute. This means there is high variation in the number of words second graders can read in one minute. Ask the class how much variation they think there might be in their district in terms of teacher attendance rates, student attendance rates, class size, or hours per day of direct instruction. Explain to the group that the more variation there is in the thing we are researching the larger the sample size we will need.

- Third, sample size depends on the **size of the population** as a whole, so in our example, how many second graders there are in the district. The larger the population size the larger we need our sample size to be. Tell them though that although it seems strange this factor is the least important of the three, by far. To understand why, note that sampling is like taking a sip of soup to see how salty it is. If the soup is well-stirred (if the sample is random) a sip of the same size will tell you how salty the soup is whether the pot holds one liter or ten liters. *Emphasize that there is no such a thing as a formula that gives you a percentage for the size of a sample based on the total population.*

STEP 4: (Exercise –30 minutes). To demonstrate the relative unimportance of the population size, in determining the sample size, take the bags of beads and combine every two of them so that each bag now contains 200 beads (which also means that teams of two will now become teams of 4). Repeat the same exercise from the Session 4, with the same sample size of 20. (See Session 4, STEP 2: A through E for instructions. Do it at least twice, by each group, so that we have enough samples.) Did the accuracy of the sampling decrease noticeably now that the population (the beads in each bag) is bigger?

STEP 5: (Lecture: 30 minutes). This step covers the subject of a **sampling frame**. Remind participants that a random sample means that every member or observation within the population (or population sub-group) has the same change of being selected as part of the sample as any other member of the population or of a sub-group. A random sample is a sample produced by some random process, such as picking beads from a bag. This means that as survey designers we need to

have an accurate list of all the members or observations in the population. We need to "put the beads in the bag" first! We need to have something we sample *from*.

This is the *sampling frame*.

Let's say we are going to take a sample of schools. In that case, what is the sampling frame? How do we get a sampling frame? How is it build?

Explain to course participants that there are some common problems with sampling frames that need to be looked out for and avoided as much as possible. These include:

- Missing observations: there may be some sampling units that are not in the list or frame. How does one check?

- Duplicate observations: some may be listed twice, under the same name, or sometimes may seem to be listed twice because they have the same name. What's a good solution for that? (Hint: Unique EMIS number.) How do we know it is a duplicate, rather than two units that have the same name but are actually different? (Hint, look for other characteristics.)

- Mistaken observations: some may be in the sampling frame even though they do not belong there. For example a sampling frame of public schools may include some private schools.

Tell the participants that there are ways to deal with each of these problems (see below).

Tell the participants that it is very important to check carefully through the population list for any possible problems and to fix these problems before the sample is chosen.

In cases where you do not have the full sampling frame in advance you have to do your best to correct for any mistakes as you go through, and once you have finished the sampling process.

- For missing observations, we can redefine the target population so that it only includes the observations that we have. This would mean finding out how many words second graders *who are in school* can read in a minute. Or we can add in the missing observations. This would mean finding out from communities, local government, or schools who are the second graders (or were supposed to be second graders) who never entered school or who are no longer in school or were absent the day of the survey and then adding these children into our sampling frame.

- For duplicate observations, the main solution is to check for duplicates and remove them from the list. Rearranging your list in various ways, for example by age, by school, by birthday, by mother's name etc, can help you identify duplicates. This can be done much more easily with a computer than by hand.

- For mistaken observations, the best solution is to check the list for any possible mistaken observations and remove them prior to selecting the sample. Some mistaken observations may be impossible to find but others, who do not meet basic sample criteria or who clearly have been included by accident can be spotted and removed.

  Exercise: Have participants refer to Excel Exercise 5.1. Have them identify possible duplicates. What is a good way to identify duplicates (identify duplicated names). Also sort by centre number, see if any two the same. Hint: check data other than that which you have sorted by. If all else fails, get clear from local information.

  STEP 6: (Lecture and exercises.) Once the sampling frame has been checked for potential mistakes, the next step is to draw a random sample from this sampling frame. Got to Excel Exercise 5.2, and demonstrate, and have them exercise, how to select:

  1. 60 schools completely at random. Just generate a random number, fix it by using Copy and then Paste the Values, sort by the random number, and pick the first 60.

  What might be a problem in sampling that way? (Hint: costly to go to 60 schools spread all over the country.) So try this.

  2. 15 districts and then 4 schools per district. First copy the names of the districts to some area below the main list, then create a list of unique districts (use Advanced filter) right next to the list of districts. Then pick 15 districts using a random number. Then sort schools by random number within district and pick the first 4.

  Note that if one chooses like this, one has to have weights, because the districts are not all equal in size. A randomly chosen district, if very big, is more representative of the total population than another, but smaller, randomly chosen district. So, when making calculations, you then have to weight the districts, which is a bit of a problem later. One way around this is to choose the districts according to their population. Thus, large districts would have more chance of appearing in the sample.

  3. So, experiment with choosing 15 districts according to population, in Excel Exercise 5.2. See list of districts by population. Randomize using random numbers and sort by the random number. Create a running total of the randomized list. Take the total enrolment, divide by 15 to determine a sampling interval, then create running total of the sampling intervals. Then take the district with the first number above the current sampling interval indicator, and so on.

When it comes to choosing schools within the districts, ideally follow a similar procedure. This is all a bit painful to do manually. Statistical software can help do it automatically, and you can also design Excel programs that do it automatically, a bit more easily.

Finally, for selecting students, within schools, do you need to choose proportional to anything? No, because every student counts equally.

Often, student enrollment data will not be provided to the assessors ahead of time, in which case they should take the following steps to draw a random sample of 10 girls and 10 boys in each classroom. See Excel Exercise 5.3.2.

A. Count the total number of female students in each stream, and number of male students in each stream.

B. Divide the total number of girls by the number we want. For example, if there are 95 girls, and we need a sample of 10, calculate 95/10= 9.5 and round to either smaller or bigger number. In our case, we'll use 9. Use this answer (thus, number 9) to count from the Stream 1 register and select each 9thth girl until you have 10 girls. In this case, it would be the 9th, the 18thth, the 27th, 36^{h}. Then, move to the Stream 2 register and keep counting.

STEP 7: (Review: 10 minutes) Review the main concepts in this session with the participants.

- Ask them what three things sample size depends on.
- Ask them what variation means.
- Ask them why it is important to be sure to have a complete and accurate sampling frame and what some of the dangers are in sampling frames.
- Ask them to review the steps of how to identify a sample from a sampling frame.

SESSION 6: Questionnaire Design and Coding

PURPOSE: The purpose of this session is to take participants through the steps of designing a questionnaire and to show them what makes a good versus a bad questionnaire.

TIME: 4 ½ hours

OBJECTIVES: By the end of this session participants should:

- Have designed a basic questionnaire on second grade teachers' knowledge of reading standards, interventions, and assessments
- Know some of the qualities of good and bad questions

PREPARATION: This session does not require any special preparation.

DELIVERY: **STEP 1:** (Introduction, 15 minutes). You should begin by telling participants that questionnaire design is a very important part of effective research. A study done with a bad questionnaire will not result in useful findings. Tell them, also, that questionnaires are not that easy to design, and that many things need to be considered and several steps taken, to end up with a good questionnaire. Not all research involves questionnaires. Some research subjects will involve direct testing or assessments of students. Others may involve direct observation of classrooms. Still others may use pre-existing data such as school or district records.

Explain to participants that questionnaires are useful for collecting information that we don't already have and that is not easily observable or testable.

Ask participants for some examples of areas of educational research that would benefit from questionnaires.

Remind them that questionnaires can be geared toward students, teachers, principals, or parents/guardians, communities in general, etc.

Tell participants that in this session they will use what they learn about questionnaires to design a questionnaire themselves and pilot it. The goal of this questionnaire will be to monitor teachers' knowledge of early grade reading standards, interventions, and assessments. First, though, they will review some of the important things to know about questionnaires and questionnaire design.

STEP 2: (Lecture. 15 minutes). **The most important aspect of a questionnaire is that it should provide the information needed to answer whatever your research question(s) is/are**. In this session we want to design a questionnaire that will help us answer the following questions:

- Do second grade teachers know of and follow a set goal or standard for their students' reading progress?
- What methods or interventions are teachers using to teach reading in the second grade and how often do they use these methods?
- What methods are teachers using to assess their students' reading skills and how often do they use these assessments?

As we design our questionnaire we need to keep these research questions in mind. We want to be sure to ask questions that are necessary to answer our questions. At the same time we don't want to ask unnecessary questions that will make our questionnaire longer and will not provide useful information. The longer the questionnaire, the lower the quality of data we get from the questionnaire because respondents get tired, bored, and frustrated. So we want to keep the questionnaire short and to the point.

6:1

STEP 3: (Lecture, 30 minutes). **Several general principles should be kept in mind when designing any questionnaire**. Refer to Overhead 6.1 and Handout 4C: EGRA Liberia Principal Assessment Instrument, and go through these one by one with course participants.

A. Each completed questionnaire needs to be able to be **uniquely identified**. You can do this by listing the name of the interviewee and the date and location of the interview as well as other information that makes the questionnaire unique, such as (in a school survey) the school name and location or school identification number. Sometimes it is easier to have a unique identification number on each questionnaire. This also allows for great confidentiality or anonymity. All questionnaires that are administered by a trained interviewer should also have the name of that interviewer. In some cases it is a good idea to put at least some of the identification information on **every page**, in case the questionnaires come unstapled.

B. Questionnaires need to be **neat and easy to read and complete**. This may sound obvious but many questionnaires are not neat or easy to read or complete. It doesn't matter if the respondent himself or herself fills out the questionnaire or if an interviewer does it for the respondent, the questionnaire always needs to have a nice and clear layout. Using shading, boxes, or other symbols can help neaten questionnaires or make them easier to understand and follow.

C. Related to this last point, questions on a questionnaire should be **numbered**. This helps respondents and interviewers complete the questionnaire with ease and comfort. It also helps with coding.

D. **Leave room** between questions, if possible. This also neatens up the questionnaire and helps respondents and interviewers follow the sequence and understand the questionnaire better.

E. Be sure to **include any instructions**. Often questionnaires will have a brief introduction and instructions at the beginning of

the questionnaire. Instructions are also often included before a new question that requires new instructions. It is important to distinguish instructions from questions. You can bold, italicize, underline or put instructions in a different font, size, or color.

F. **Critical words or ideas can be bolded or underlined**. If a question is clearer when a certain idea is emphasized, bolding or underlining that idea can make sure that everyone understands the emphasis.

G. Show/demonstrate the importance of **question sequence**. The first questions should be easy to answer and engaging. Sensitive or more difficult questions can be spread out in the rest of the questionnaire or left for last. Open ended questions can also be tiring for respondents if they are placed between multiple choice responses. Keep questions of one subject together. Use question sequence to stimulate memory. Filtering questions can help interviewers and respondents skip unnecessary questions.

H. Set up your **coding frame** in advance, or at the least, keep in mind how you will code respondents' answers. Dual answer options like "yes"/"no" or "agree"/"disagree" are easy to code. Multiple choice response options are harder to code. Open ended questions are the hardest to code. Provide an example of how coding is done.

I. Always **pilot test** your questionnaire. Once you have designed and finalized the draft of your questionnaire you must always pilot test it. Pilot testing the questionnaire means giving it to a few potential respondents and identifying any problems with it. The pilot test ensures that respondents, researchers, and interviewers all understand questions in the same way. It also identifies any weaknesses in instructions provided to assessors. Additionally, it provides information on potential logistical issues.

Let course participants know that in the next session they will do a role play pilot test exercise with the questionnaires they designed in this session.

Ask participants if they have any questions about any of this material and respond.

STEP 4: (Lecture, 30 minutes). Tell participants that now that they have a sense of the overall goals and layout of a questionnaire, they need to think about designing the actual questions. Remind them that the questions need to collect reliable and valid information that answer your research questions. (Refer to Overhead 6.1.)

One tip that is useful is to put yourself in the mindset of the questionnaire respondent when you design your questions. Who are the respondents? Are they children or adults? Are they well-educated? What language do they speak? How are they likely to feel about being

interviewed? How much do they know about what you are going to be asking about? Will they understand the questions? Will they be embarrassed that they don't know the answer to something or can't remember the answer to certain questions? In designing a questionnaire try to avoid difficult, embarrassing, time-consuming, or confusing questions. You are less likely to get reliable valid responses to these types of questions because respondents could become upset and uncomfortable and could end up giving you inaccurate answers or no answers at all.

6:2

In general, questions should be **brief, objective, simple, and specific**. Refer to Overhead 6.2 and Handout 4C: EGRA Liberia Principal Assessment Instrument and go over each of these.

A. **Brief**. Try to keep questions to 20 words or fewer, and limit the number of commas used. Make sure that there are no 'hidden' questions inside the question (these are also called 'double-barreled' questions). This forces the respondent to agree or disagree with all the questions, instead of giving them the opportunity to independently assess each question. The inclusion of the word "and" is often a red flag for a double-barreled question. The following is an example of a double-barreled question: "Do you agree that the MOE should abandon ICT program and invest into school-feeding program?"

B. **Objective**. Make sure that the questions you ask do not lead respondents towards certain answers. Respondents can be swayed toward certain responses when the language used elicits positive or negative ideas, the set of response options is biased or limited, respondents would feel impolite or vulnerable giving an honest response, or when there is missing information not provided in the question. *Create some examples with the participants.*

C. **Simple**. Questions should be direct, simple, and easy to understand. Use simple language that respondents are familiar with. Keep the same terms and language throughout the questionnaire. Avoid technical terms. Avoid negatives and double negatives. Keep in mind that respondents should not have to work hard to answer questions. If there are conditional clauses in the question, put them before the main question: "If you teach phonics, how do you teach it?" Not "How do you teach phonics, if you teach phonics." Avoid sensitive questions if possible.

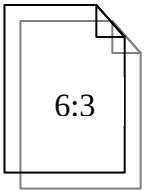
D. **Specific**. Ask precise questions avoiding questions that are too general or too complex. If you are going to use multiple choice answers be sure that the answer options are mutually exclusive and collectively exhaustive. One simple way of doing this is having 'other' as one of the answer options in multiple choice questions.

Questions to interviewees can be fact-or opinion-based and both have to be distinguished from observation-based measurement. Fact-based

questions ask respondents about their present or past experiences or practices. For example, a question that is fact-based might be "How long after the school year started did the textbooks arrive?" The response to this question is not a measurement; it is a fact-based response. An example of a real, observation-based measurement question would be to ask the director for his materials log-book and to take note of the date of receipt of the materials. Be cautious with questions that depend on respondents' memories; the farther back the memory and the less important the experience to the respondent, the less likely they are to remember it correctly. Opinion-based questions are those without a correct or factual response, and that are aimed at understanding the respondents' opinions, ideas, and beliefs. An example of an opinion-based question would be to ask "What do you think of the timing of textbook arrival?" Observation-based measurements do not rely on interviewees' responses but on nominally 'objective' observation. An example of an observation-based measurement might be "In the observed classroom, how many students have textbooks with them?"

Responses can either give a set of response options or open ended. Response options allows for easy coding and tabulating of responses. Open ended questions can at times give deeper insight into responses and can be more enjoyable for respondents.

Ask participants if they have any questions about any of the material and respond.



STEP 5: (Activity, 1:30 hours). Tell participants that now that they have learned some basic guidelines for designing questionnaires, they are going to design their own questionnaires in small groups. Remind them that the questionnaire they are going to design should provide information on second grade teachers' knowledge of reading standards, methods to teach reading fluency, and reading assessment. They can also use the list of questions provided to them in Overhead 6:3. But ideally they should come up with the questions themselves. Tell them that after they complete their questionnaire, they will review the work of each group and then select the best questions for the final version of the questionnaire.

Remind them that the first step in any questionnaire design is to think about questions that you want to be able to answer once you get your data.

In a plenary, have the participants brainstorm a few questions that they want to be able to answer from their questionnaire data. While brainstorming, provide them with a list of questions around which they should construct their questions (Overhead 6.3). There are many other possible research questions. Push them to think of different kinds of questions, factual, opinion, etc. and have them do this in design stage too.

(Note: Don't spend too much time here on generating a long list of questions. Focus on the process of brainstorming so that they can be very effective while working in groups.)

A. Review the steps of this activity:

1) Design a questionnaire with 8-10 substantive questions (in addition to background questions), and make sure to follow the guidelines reviewed in the session including questionnaire requirements, qualities of good questions, and question sequencing.

2) Provide participants with research questions/themes around which they should design the questions (Refer to Overhead 6.3).

3) Divide participants in 4-5 groups of 4-5 participants (depending on the total number of participants), and give the groups around 30 minutes to come up with the questions, and then 5 minutes to write them up on flipchart papers (post these papers ahead of time).

4) Have them write up their questions on flipchart paper.

5) Vote to choose 8-10 good questions that will make it to the final version of the instrument.

6) In the plenary, discuss each group's question and start developing the final version of the questionnaire. Facilitator or assistant should write these up on the screen as the group agrees.

Details on these steps:

B. Divide participants in 4-5 groups of 4-5 participants (depending on the total number of participants). Give groups approximately 30 minutes to design 8-10 questions around the themes specified. Before the exercise begins, refer participants to Overhead 6.3.

6:3

- Have you received any training on how to specifically teach reading in early grades? At all?
- Do you develop lessons plans specifically for reading?
- Do your lesson plans state objectives for teaching reading?
- Do your lesson plans include plans and use of resource materials?
- Do you use resource materials to teach reading?
- Do you teach children the names of alphabets/letter?
- Do you teach children the letter sounds?
- Do you teach phonemes?
- Do you read aloud short stories to children?
- Do you have children read aloud to you?
- Do you teach sentence structures to children?
- What type of teaching aids do you use in teaching children how to read?
- Do you give home work to children?
- After marking the assignment what do you do for the children who missed certain work?

- What do you say or do to the children when they do well in their class or home work?
- What do you do or say to the children when they do badly in their class or home work?
- Do you assess reading?
- Did you receive any training on how to assess reading?
- Did you receive any training on how to assess comprehension?
- How do you assess comprehension?
- Do you have a school library?
- Are children allowed to take school text books home?
- How many of your students do you think can read?

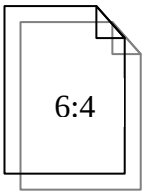
As the groups work, you should walk around visiting the groups, reviewing their work and answering any questions that come up. Make sure that groups are following the guidelines reviewed earlier in the session.

C. Give them 5 minutes to write their questions on the flipchart papers.

D. Have groups read their questions aloud, vote and agree upon questions for each theme. Remember, there should be 8-10 substantive questions in addition to background questions. Spend 20 minutes.

E. Once completed, ask the group as a whole to review their experience writing the questionnaires. Was it difficult or easy? What went well? What didn't go well?

STEP 6: (Activity: 1 hour and 30 minutes). Now that the participants have agreed upon the questions to be included in the final version of the instrument, they need to finalize it. Have them go back to their original groups and show them that each questionnaire should have the following characteristics (Refer participants to Overhead 6.4). For this exercise, work in pairs or groups of 3, and have each group draft up a version of the questionnaire.



1) Identification of interviewee (if possible) and link to other interviewees (e.g., link children to teachers, teachers to schools, etc.). This is key if you want to link child performance to teacher practices, say. You may want to have the one basic ID factor on every page in case questionnaires come un-stapled.
2) Clear, neat layout;
3) Numbered questions;
4) Complete and clear instructions;
5) Brief, objective, simple, and specific questions;
6) Logical sequencing of questions.
7) Pre-think how you will code and make sure it is embodied in the questionnaire.

After, show own version of questionnaire as written up in real time by the facilitator or assistant, and discuss.

STEP 7: (Activity, 1 hour. Coding)

STEP 8: (Discussion). At the end of this session have the participants share some things they learned going through this exercise of designing and then reviewing a questionnaire. They should be discussing the process of constructing questions, sequencing questions, deciding which questions to include and why is this choice critical (content validity), etc. Give the participants 10-15 minutes for this discussion. Write these lessons-learned on the board or flipchart.

SESSION 7: Piloting the Questionnaire

PURPOSE: The purpose of this session is to role play a questionnaire piloting exercise. This exercise and its discussion will teach course participants about the purpose of piloting, the importance of piloting, and how to pilot a questionnaire. Usually, questionnaires must be piloted in schools and mock sessions are not to be relied upon as the sole means of piloting. However, for the purpose of this course, we'll use a mock session to pilot the instrument that we have developed in Session 6, as many of the participants already have field experience. (Note: this refers to the specific case of Liberia.)

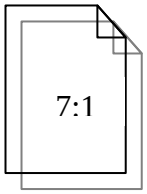
TIME: 1 hour 15 minutes

OBJECTIVES: By the end of this session course participants will:

- Have pilot tested a questionnaire in a mock situation
- Understand the purpose and importance of pilot testing

PREPARATION: For this session, each person needs to have a final copy of the questionnaire from Session 6, so make sure enough copies have been printed. *May need to print over the break.*

DELIVERY: **STEP 1:** (Introduction). Introduce the purpose of the session to course participants. Remind participants that piloting is a necessary step in designing a questionnaire, and in designing an assessment. Refer to Overhead 7.1 In order to get reliable and valid data, all participants need to understand questions in the same way that researchers and interviewers intend. Often problems with the questionnaire or assessment emerge that were not evident in the design process. Piloting allows for a real world test of the questionnaire or assessment. It also gives other important information, like how long the questionnaire or assessment takes and information that interviewers need to know. Tell participants that there are several ways to pilot test a questionnaire or assessment, but one of the primary ways, called a conventional pilot test, is where researchers administer the questionnaire or assessment to a small number of potential respondents and then discuss the process with them afterwards.



STEP 2: (Activity). Have participants sit in groups of four. Distribute the photocopied questionnaires so that each person gets a copy of the questionnaire.

A. Have two participants pilot the instrument: one member will administer the instrument and the other will respond to the question. The first member needs to pretend that s/he is the assessor, while the second member needs to pretend that s/he is a second grade teacher. Remind them also that given that this is a mock pilot, they should be professional and try to reconstruct the real setting.

B. The other two participants should observe the pilot being undertaken by the first two participants and write down their

observations, comments, and suggestions. When completed, the roles should be reversed. This all should last about 20 minutes.

C. As already mentioned above, if participants were implementing the survey, they will have to conduct a real pilot with teachers.

D. Spend a few minutes in plenary discussing what improvements need to be made to the questionnaire based on what they learned during the pilot. While discussing, make steps towards the agreement on the final version of the instrument. In the last 5 minutes, finalize the instrument. Facilitator should write up the changes on the screen as the participants agree.

Step 3: (Review and discussion). Ensure that course participants now know how to design an effective questionnaire, pilot it, and finalize it.

Ask for any reflections, comments, or questions. Did any unexpected issues arise in this process?

Session 8: Collecting Data

PURPOSE: The purpose of this session is to review different data sources, and learn and practice interviewing techniques.

TIME: 1:30 hours

OBJECTIVES: By the end of this session participants will have:

- Identified a number of different data sources for their educational research.
- Watched a staged assessment demonstrating good and bad interviewing/assessment skills.
- Defined effective interviewing/assessment techniques
- Practiced assessing a course participant.
- Received feedback on their interviewing/assessment skills

PREPARATION: This session does not require any specific preparation.

DELIVERY: **STEP 1:** (Introduction). Introduce the session. Explain to the participants that making good policy decisions depends on having reliable data. This session will explore sources for reliable data and in particular it will focus on how to conduct an interview or assessment in order to get the best quality data possible. In the next session we will all go out to a school and practice conducting assessments in the field.

STEP 2: (Lecture and discussion). This section covers data sources. Data is the raw information we collect and analyze in order to answer our research questions and inform our policy decisions. In education, **data can come from a number of sources**. In this course we will focus mostly on data that we go out and collect ourselves. That is why we are learning how to design and use questionnaires and assessments. However, there are also pre-existing data source in education.

Ask participants, if they wanted to find out where they might need more or less teachers within their region, where would they get this information on school enrollment? *They should answer that districts and/or schools maintain information on school and class size.*

Ask them where they would look for information if they wanted to find out how well teachers were educated in the district? *They should answer that the province, district, or central education office house data on teacher education level.*

Tell them that these are pre-existing sources of data. Are there annual school censuses? Do teachers maintain attendance and tardiness information? Do school principals maintain data on the number of school days? Do districts maintain information on how many textbooks each school receives each year?

Ask participants to name different pre-existing data sources for raw data on education. Write these sources up on the flipchart or board.

Before designing a questionnaire or assessment, researchers should first consider if the data they want already exists. If it does already exist, they may also wish to ask themselves or determine how reliable that data source is.

When pre-existing data does not exist or is not of good quality, we will often want to collect the information ourselves using the survey techniques we've been discussing in previous sessions. In this session we will go over good interviewing and assessment techniques and we will practice doing a reading assessment in order to become familiar with the assessment for the field trip in the next session.

8:1-2

STEP 3: (Lecture and discussion). This section covers basic interviewing and assessment etiquette. Refer to the interview/ assessment etiquettes in Overheads 8.1 and 8.2 and review key points with participants.

Ask participants if there are any other points that they would add that are important in the communities and schools they work with.

STEP 4: (Dramatization). In this step you are going to role play a reading assessment of a child and an interview of a teacher. You will act as the interviewer and you will have a course participant act as the child for the assessment, and then another course participant will act as the teacher in the interview. Tell course participants that you are going to act out part of each survey twice. Ask participants to observe both sessions of each survey and to think about what were effective and what were ineffective survey techniques in the demonstrations.

A. Refer participants to the Liberia reading assessments in Handouts 4A, 4B and 4C and review them briefly showing participants the identification questions, the types of assessment it includes, how it is set up to be coded, and other key points from Session 6 of questionnaire and assessment design.

B. Act out being a good reading assessor using key points listed in the interviewing techniques given in Overhead 8.2. In the second demonstration, be a bad assessor who violates the points in Overhead 8.2. You don't have to go through the entire assessment, just a few minutes to demonstrate effective and ineffective surveying techniques.

C. When you are finished with the dramatizations ask participants to share their thoughts on what worked and what didn't work in the assessment. Lead the discussion such that many of the points in the overhead are discussed.

D. After that, do the same dramatizations of the teacher interview. First be a good interviewer and then, in the second round, be a bad interviewer.

E. Discuss these dramatizations in plenary. What were the things that made you a good or a bad interviewer? Were they the same as in the student assessment dramatization?

8:2

F. Review the points that were covered in the discussion and go over any points that did not come up in the discussion. Give examples to demonstrate techniques.

Ask participants to comment and share ideas.

STEP 5: (Activity). Explain to participants that now they will practice being an enumerator as they will be doing it in the field in the next session (tomorrow). Participants will be divided into groups of three and each group will get three survey tools.

A. Divide participants into groups of three. The Liberia reading assessment instruments can be found in Handouts 4A, 4B and 4C. If the participants manage to complete their own teacher questionnaire and if copying has been arranged, use that instrument. However, in case that something does not work out, there should be enough copies of the Gambian instrument to allow for uninterrupted exercise. As for the reading instruments, make sufficient copies for both the pilot and the next day's field exercise. At night, arrange for the teacher instrument to be copied as well. The participants can decide who will conduct each assessment. Explain that everyone will have an opportunity to try out each role. Member A will give the survey first. Member B will role play the interviewee first. And Member C will be a silent observer.

B. First, have everyone read through the questionnaires that they will administer to themselves in order to familiarize themselves with it. Administration of student assessment takes about 15-20 minutes. For two members in a group, this task will take about 40 minutes. The administration of teacher instrument takes

about 15 minutes, so for two participants this step will take about 30 minutes.

C. The participants will first of all practice the administration of student reading assessment instrument in both English and Kiswahili. Before they begin, go over each task, explain how to: a) give instructions to students, b) time each task and record time, c) score each task and record the scores.

D. Now, have the interviewers ask the questions and record respondents' answers. The interviewer should tell the interviewee what role they should play (student or teacher). The observers will take notes, writing down any feedback to tell the interviewer after the role play is done. Remind interviewers and observers to keep in mind the techniques they just watched and discussed.

E. After the survey is concluded have the groups debrief, having the observer and the respondent giving feedback to the interviewer. Give 5 minutes for debriefing.

F. Have the teams switch roles, conduct the survey and debrief in their new roles.

G. Once both members in the group have had a chance to practice the student, they should start practicing the teacher instrument.

Step 6: (Discussion and review). Bring the group back together in plenary and discuss the experience.

What went well?

What was difficult?

What are lessons to keep in mind for the field exercise in the next session?

Discuss strategies for avoiding the problems that came up.

SESSION 9: Field Exercise

PURPOSE: The purpose of this session is to bring course participants out to a school and have them practice assessing students and surveying teachers using the assessment and survey tools they used in Session 8.

TIME: 4 hours

OBJECTIVES: By the end of this session each participant will have

- Completed three student assessments or two teacher questionnaires
- Debriefed their experience

PREPARATION: Because this is a field exercise this session will take a fair amount of preparation.

1. At the beginning of the workshop, in consultation with Ministry of Education counterparts, identify two nearby schools where workshop participants can be taken to practice instruments.
2. Depending on the distance, participants can either walk to these schools or travel in a bus, that is arranged previously to take them there.
3. Ensure that the day before the field exercise, sufficient copies of instruments that will be administered are prepared
4. Prepare all supplies that will be needed: pens, clipboards, stopwatches, and bags. It is customary to give gifts to students, these can be pencils or pens and/or erasers. Bring sufficient quantity for all children in the grades that you will test.
5. The day before you go for the field exercise, go over the steps with the participants. Divide participants into two groups. Each group will be accompanied by one trainer. Each trainer will then further divide participants into teams of two. Both of these two participants will have a chance to practice and they should decide who goes first. Hand out their supplies and tell them that clipboards and stopwatches are to be returned by the end of the workshop.
6. Once you arrive at the school, meet the principal and the teacher. Explain the purpose of the visit and say that you will assess students in grade two. Kindly ask for a place where you can conduct assessment (a library, an empty classroom or if none is available, then outside in the playground).
7. Together with the teacher go to their classroom. Ask a participant from your group to select 10 students randomly. You stay with the children.
8. When students are selected, you send them one by one to the participants. Have each participant practice at least once. If time allows, maybe you can do another round of practicing.
9. At the end of the school visit, meet with the teacher and principal and thank them. Leave all of the gifts for children behind so that the teacher can give it to all students in his/ her class.
10. Go back to the workshop site and debrief on what went well, what went wrong, what questions need revisions, and so on.

DELIVERY:

STEP 1: (Introduction, 30 minutes). Introduce the field exercise. Go over the sequence of events and the logistics (who will go to which classrooms, etc). Grades 1 and 2 will be assessed in two schools. Explain that each person will conduct either three student assessments or two teacher interviews. Assign who will conduct which interview ahead of time. Those doing student assessments will employ random sampling techniques to choose the students within the classroom they are assigned. Teacher interviewers will simply be assigned teachers because not all the teachers in the school will be interviewed, only those who teach second grade. Given that there are usually 2-3 first and second grade teachers, thus entire population will be surveyed.

Review the purpose of the exercise and the main things participants should keep in mind while conducting the field exercise. This includes appropriate interviewing etiquette and techniques, recording of identification and responses on each assessment. If you have extra trainers, assign them to specific groups of participants (all those going to one classroom for instance).

STEP 2: (Lecture). Before leaving for the site, explain how random sampling is conducted at the classroom level. Remind the participants that they have learned this in the sampling section. Each participant will conduct his/her own interview while the trainers should go around and observe.

STEP 3: Transport participants to the site.

STEP 4: (Activity, 1 ½ hours). Conduct the field exercise. You and any additional trainers that came with you should be moving around listening, watching, and answering questions. Trainers should not interrupt assessments but participants can find their trainer in between assessments/interviews if they have any questions or concerns. Trainers should communicate both the strengths of the interviewer and the areas for improvement.

STEP 5: (Review, 45 minutes). Either at the school or back at the training site review the experience with participants.

Ask participant to share their thoughts on what went well and what could have gone better.

How can things go better next time?

SESSION 10: Entering Data

PURPOSE: The purpose of this session is to familiarize participants with a data entry form, practice data entry, and review some of the threats to reliable data.

TIME: 2 hours

OBJECTIVES: By the end of this session participants will have

- Become familiar with a data table
- Entered their assessment or interview data

PREPARATION: 1. Participants have to bring their completed assessments or interviews from Session 9 to this session.

2. For this session you need to have prepared data tables for both the student assessment (Excel Exercise 10.1) and for the teacher questionnaire (Excel Exercise 10.2). Note that for the teacher questionnaire, say that we used an example to illustrate the data entry form in this manual. This data entry form will be adjusted once a teacher instrument is developed during the workshop.

DELIVERY: **STEP 1:** (Introduction) Explain that data entering or capturing is the process of bringing together all the information collected in the interviews or assessments. Once the information is entered it can be analyzed.

> Ask participants why it is important to tabulate the information they've collected. Possible answers include that they need to do so to analyze the data and answer their research question, and it is a necessary step towards making policy decisions and identifying needs.

STEP 2: (Lecture) Explain that for every questionnaire you need to develop a form where you can collect all the information in a useable way. Remind the group that one of the key steps in making a questionnaire or assessment is to plan how you will code responses. The data table is where you will do that coding.

Go over the data table. Show where the identification questions are, where any basic information is recorded, and then were the responses to each of the assessment questions themselves are recorded. Then explain the coding systems used in the data table. Be sure to explain X=Missing, S=Skipped, DK= don't know, and 0=means really zero and the difference between each.

It is important to ask questions, given that missing data is a waste of data and time. If a question was not asked (for various reasons), then it is a skipped question.

Use Excel Exercise 10.3. Once data entry form has been developed, adjust the code book in Excel Exercise 10.4). (The task is to be completed in plenary; should be projected on LCD so that the participants can see/contribute to these adjustments.)

Ask if there are any questions and respond.

STEP 3: (Demonstration) Ask for a completed assessment from the group and go through the coding and data entry of that assessment with the group. Have participants ask any questions as you go through this process.

Then do the same for the teacher questionnaire. Code the responses and record them on the overhead.

STEP 4: (Activity) Explain that in groups of three, course participants will now record the information from their completed questionnaires into the Excel spreadsheets that they worked on in the previous task (Excel Exercises 10.2. and 10.3). Whenever possible, groups should include people who conducted both student assessments and teacher questionnaires.

- The first person reads the question on the data table.
- The second person has the survey and reads the question and response aloud and then calls out the coded response.
- The second person then records the coded response on the data table.
- The third person checks the work of the first and second people.

Explain that whenever possible it is good to do this work in groups of three because as people get tired they can begin to make mistakes. Teams of three should tabulate all of their compiled assessments and interviews.

A. Have the groups begin the data entry process. Be sure to move around, checking the work of the groups and answering any questions that come up.

B. After each assessment or interview is recorded have the groups check their work. Are all the cells filled in that should be? Are all the responses in the same row?

C. Groups continue and complete the tabulation process, switching roles every two or three surveys.

STEP 5: (Review) Review and discuss how the tabulation activity went. Are there any outstanding questions or concerns?

SESSION 11: Data Analysis

PURPOSE: The purpose of this session is for participants to learn to analyze data, converting raw data into indicators that help answer research questions. In order to make the calculations easier for participants, two schools out of 40 were selected. These two schools have a similar average, but different Standard Deviations. However, for some other examples that don't require any calculations, the data from all 40 schools is used for explaining concepts.

TIME: 4 ½ hours.

OBJECTIVES: This is a lengthy and calculation-heavy session. By the end of the session participants will have calculated, and understood the meaning and significance of :

- Percentages and rates;
- Ratios;
- Averages;
- Standard deviations;
- Confidence intervals

This session also includes a step that reviews the calculation for choosing a sample size. This can be used if course participants have relatively advanced math skills.

PREPARATION: 1. For this session each participant will need to have soft copies of the compiled data for 800 students from the EGRA baseline assessment in Malindi District, Kenya. (Excel Exercise 11.1)

2. For this session each participant will also need both soft and hard copies of data for 40 students from 2 schools selected for calculation of averages, standard deviations and confidence intervals (justification: manual calculations of mentioned indicators will serve better in explaining concepts than if we had the participants use Excel and data for 800 students). (Excel Exercise 11.2)

DELIVERY: **STEP 1:** (Introduction, 20 minutes). Review the course outline with participants highlighting what they have covered so far and the point they have reached. At this point, participants have learned to design research questions and survey plans, they have learned to set up random samples, design questionnaires, conduct questionnaires and assessments, and then convert that information into raw data. The next step is to analyze the data, to use the information gathered to learn concretely about the research topic and answer the research question.

Ask participants why it is important to convert raw data into indicators.

When we are presented with raw data alone it is often very difficult to understand or make meaning out of it. Indicators allow us to place the raw data into a context and give it meaning in terms of our research topic. Indicators allow us to see **patterns** and **relationships** in the data. Give some examples of this:

We may find that 198 students in our sample can read more than 20 correct words per minute in English and this has very little meaning. By contrast, knowing that only 24% of our sample can read more than 20 correct words per minute tells us that only 24 of every 100 sampled students are meeting this standard.

STEP 2: (Lectures and activities)

Note: For this section you should adapt the curriculum based on the skill level of the participants. If they are familiar and comfortable with percentages, averages, etc, then you don't need to dwell on the calculations but can focus instead on their interpretation and meaning and then move on to the complex indicators like confidence intervals and standard deviation. If they are less familiar with the basic indicators then you should be sure to go through the definitions and calculation exercises carefully.

Note: Eventually one may need to lay this out in "nicer" narrative terms.

We will be using Excel for most of these exercises.

Spreadsheets, such as Excel, are probably the most important invention of the personal computer age (starting 1978 or so), both for business and for science. Word processing and statistical packages existed before personal computers, but not spreadsheets.

You will be taught skills that introduce you to Excel and spreadsheets and some basic statistics at the same time. These skills are very powerful, and if you learn them you can use them for any kind of analysis, not just these examples.

Pay attention to the instructions and demonstration, and do not do anything while it is going on, try it yourself **only** after the demonstration. Take notes while the demonstration is going on, so you can replicate later.

The demonstration will be given three times (depending on the level of skill of participants).

After the demonstration, try it. Ask as many questions as you want. The facilitator will repeat it many times if you are unable to understand it. In general, the bits in yellow are where you are supposed to make calculations.

Cleaning Data

Calculate the maximum and minimum, using the data given in Excel Exercise 11.1

Use the =MAX and the =MIN functions.

Can you think of two problems with this method? (Hint: It isolates only ONE outlier, and we have to keep fixing it. Hard to say whether there is anything close to it. We can isolate truly absurd numbers, such as a fluency rate of 1000).

Try another method. Sort the data. From top to bottom or by school? What makes most sense? Try it both ways, learn.

Which makes more sense? What can you do about it? Correct the outliers. How? (Go back to original questionnaire.) See the value of a questionnaire ID number?

What is a real outlier? Once corrected, re-sort it.

Once you have removed the outliers, is there some interest in knowing the maximum and the minimum?

Central tendency

Now, let's use Excel Exercise 11.2. Calculate "measures of central tendency" (mean or average, also median). Define and discuss these terms.

Mean is the sum of all values of a variable divided by the total number (For example, sum of all children's fluency).

Median is the value which splits the sample in two: all higher, all lower. If there are even number of cases, the middle two cases are divided by 2.

Mode is the most common value.

Recall definition of an average or mean.
Calculate the average using the =SUM and =COUNT
We do this to learn these two useful functions.
But most of the time we just use the =AVERAGE function

Recall the definition of the median.
Find the median using the =MEDIAN function
Speculate on why there is so much difference between the median and the mean?

Is there a mode?

Which one seems more useful? Which is more representative?

Why is the mean or average used more? (Hint: it was easier to compute in old days; and there was no need to sort; it has better statistical properties; one can calculate back up to the total need if have an average. E.g., mean of something, times the total sample or population, gets you back the total. It can be used for calculating totals, while median does not do this).

Percentages

Refer to Excel Exercises 11.3.

Percentages measure a portion in relation to a whole.

Percentages and rates are very useful indicators to get an idea of how pervasive something is. In addition, they are easy to compare because the denominator of all percentages is the same, 100.

It is simply the number of individuals meeting a certain criterion, divided by the total number, and multiplied by 100.

Examples range far and wide but a few might be:

- What percentage of second graders in schools can read at least 45 words per minute?
- What proportion of 13 year-olds are in school?
- What percentage of primary school teachers trained in using "reading corners" are currently using them in their classrooms?
- Enrollment rate
- Repetition rate
- Primary completion rate

.

Calculate the % that can read 20 cwpm or more.

Enter a 1 if reading 20 cwpm or more, 0 otherwise.

(Yes, I know there is a faster way to do this! Try it if you can think of a faster, cleverer way, and then tell the instructor and class).

Then, at the bottom, calculate the Sum (use =SUM) of all the 1s and 0s, Count (use =COUNT) and divide the sum into the count, and then press the % button on the toolbar

Alternatively, use the =AVERAGE function and then press the % button above, on the tool bars.

Copy all the work from School 1 to School 2, or re-do it.

Sample Standard Deviation

Meaning. Remind participants that averages are useful indicators because they give a sense of the general value of something. But sometimes we are also interested in finding out how much variation exists. So this example shows us how averages can hide important

information. That information can come out through measures of variability.

The standard deviation is a commonly-used measure of the variation in a set of data. **It measures about how far the average individual is from the calculated average.** That is why it is called the "standard" deviation.

Remember that the average itself is an "artificial" thing. No one individual is average. So the standard deviation tells us by how much individuals differ from the average.

The larger the standard deviation, the more variation there is in the sample; the more individuals vary from the average. The smaller the standard deviation, the less variation there is in the sample.

Now refer to Excel Exercise 11.4. Examine the data. Do both schools seem to have about the same average? How about the spread or deviation? Intuitively which ones seems to have more?

Now let's calculate it.

First, calculate the deviation of the first student from the average, for School 1. This will require learning how to use a formula. So far we have not used real formulas.

Formulas are very powerful. Pay careful attention and make notes as the facilitator demonstrates.

Second, calculate the deviation for all students, for School 1, by copying the formula. This will require you learn how to copy formulas, and one or two other very powerful tricks.

Then, calculate the sum of deviations (why zero?)

Calculate the sum of the squared deviations.

Divide by count minus 1.

And take square root.

Third, copy all the formulas from School 1 to School 2.

Results should be entered in the cells that have bold borders.

So, what can we conclude? By how much does the average student differ from the average in school 1? In school 2? Which has a higher spread?

Why are we interested in the spread?

It tells us something about how reliable and representative the mean is. The higher the standard deviation, the less reliable the mean is. It is

useful in itself and tells us something about inequality. It might even be more interesting than the mean.

Confidence Intervals

Refer to Excel Exercise 11.5. Remind participants that in this course we are talking about surveying a sample of the population in order to learn about the whole population. So we might survey 20 teachers to learn about attendance patterns of all the teachers in the district. Or we might assess the reading ability of 50 second graders to learn about the reading skills of all second graders. So far we have been calculating **point estimates** – averages, ranges, percentages, standard deviations. Point estimates are easy to understand and to calculate, but since we are calculating them from a sample and applying them to an entire population, we really have very little idea how accurate they are. In fact, we basically know that our point estimate from the sample is not exactly what we would calculate from the entire population. But how close is it? How sure can we be about that? Confidence intervals (CI) answer these questions for us.

A **confidence interval estimate** is a range of numbers and a specification of how confident we can be that the actual figure for the whole populations (population parameter) lies within a range that we calculate from the sample. So for example, a confidence interval says something like:

We are 95% confident that the average number of words a second grader can read in Malindi, Kenya, is between 8.8 and 11.6 words for the Kiswahili language, and between 17.7 and 21.6 for the English language.

Point out to participants that this sentence offers both a range (8.8-11.6; 17.7 – 21.6 words) and specifies a level of confidence (95%). So the 95% is the confidence, and the statement “8.8 to 11.6” and “17.7 to 21.6” words is the precision. A confidence interval does those two things. How sure we are is called confidence. How close we are is called precision.

Confidence intervals are important because they allow us to make statements about the whole population based on our sample. Explain that we are now going to go over how to calculate a confidence interval for a population average.

Let participants know that this is the most mathematically advanced portion of the course so if at any time people have questions to go ahead and ask them.

Calculation. Explain that there are four steps involved in the calculation of a confidence interval for a population average. (Refer to Excel Exercise 11.5).

Explain that this is ONLY APPROXIMATE.

Make sure you can interpret the confidence interval.

Why is the confidence interval narrower for 90%?

Why don't we always choose 99% or 100% confidence? Because there is a tradeoff: the more confident you want to be the less precise you can be (meaning the larger the range will be) for any given sample size. The reverse is also true - the more precise you want to be the less confident you can be for any given sample size. If you want to be more confident and more precise you have to have a bigger sample.

Choosing a sample size. Follow the steps outlined in Excel Exercise 11.6.

SESSION 12: Mini-Workshop in LQAS

PURPOSE: The purpose of this session is for participants to learn the rudiments of the methodology called Lot Quality Assurance Sampling

TIME: 5 hours.

OBJECTIVES: By the end of this session participants will have:

- Tabulated baseline survey data using the LQAS method
- Calculated average coverage
- Identified weak supervision areas and indicators in terms of average coverage
- Learned how baseline and monitoring surveys differ in LQAS
- Identified weak supervision areas and indicators in terms of coverage targets
- Suggested priority areas based on their findings

PREPARATION:

1. For this session you will need the data from all the schools on whether children can read more than 20 words per minute—the "compliers" per school. Print enough for each group of 2. (Excel Exercise 12.1)
2. Prepare a simple sheet for each school with space for the number of non-compliers (non-readers of more than 20 words) and print out enough for all participants. (Excel Exercise 12.2)
3. Provide a copy of the LQAS table to each participant. (Excel Exercise 12.3)
4. Provide a copy of a worksheet to calculated the weighted average cwpm across all schools (Excel Exercise 12.4)

DELIVERY: **(Introduction).** Review the course outline with participants. Show them that now they have learned nearly all the steps in survey design, implementation, and use. During this session you are going to highlight one particular type of sampling approach, called Lot Quality Assurance Sampling (LQAS), because it is easy to use, only requires a small sample, and is very useful in the field of education for conducting the monitoring the implementation of programs or interventions.

Remind participants that baseline analyses provide information about a subject or problem. They are usually done prior to implementing reforms or interventions and help in figuring out what reforms or interventions might be useful or necessary. Monitoring is the routine checking up on the progress of a problem or an intervention. It is usually done routinely to show changes over time.

Give participants a general idea of what LQAS is. Tell them that LQAS was developed by the private sector to do routine quality checks of their products but since then it has been adapted for use in the public sector, particularly in health, to monitor how well schools, health clinics, or communities are measuring up to some goal or standard.

12:1

12:2

The main advantage of LQAS is that it can use smaller samples. Up to now we have seen techniques that use fairly large samples.

LQAS can estimate (remember, findings are always estimations when they come from samples) how well areas measure up to standards or goals like goals for overall reading speeds or primary completion rates. So LQAS is great for finding out if second graders are meeting a goal. It is also great for checking to see if teachers are meeting a goal that a certain percentage of them are implementing a given reform.

Ask participants why it is important to be able to measure how well areas are faring in terms of a given goal or standard.

Make sure that these three points are covered in the conversation: LQAS can estimate for us (Refer to overheads):

- Whether much of a population is meeting a goal or standard;
- Whether over time the 'coverage' of that goal or standard is increasing; and
- How supervision areas within the program area compared to one another in terms of indicators (are there some that are lagging behind or pulling ahead?)

Ask participants why it matters to know these things. Say we conduct a survey and we learn that teachers in the rural areas are not implementing a reading instruction reform as much as in its urban areas. As district education leaders what would you do with this knowledge? Or say we conduct a reading assessment and we find that throughout the district fourth graders do fairly well at identifying the names of letters but they do very poorly at reading speed and comprehension. How might this information help you in using resources or implementing interventions? Emphasize that this information allows us to set priorities for resource allocation and policy and program interventions.

12:3-5

Tell participants that it is important to realize that LQAS can be conducted with a sample size of only 20. You only have to survey 20 randomly selected individuals to get reliable information from a LQAS survey. Refer to Overhead 12.3 and explain why we use a random sample of 20, and what a random sample of 20 can and cannot tell us.

STEP 1: (Discussion). The first step is goal-setting. For goal setting, we need to review the data. Let's look at schools that will be provided with extra help, to get a detailed sense of where they are now.

Refer to Overhead 12.5 with data. This represents the average correct-words-per-minute per school. What is the overall average?

- What are the differences between the percentages of students meeting the reading standard between the supervision areas? How different are they?
- Overall in the district does compliance with the standard appear high, low, or mixed?
- What might be possible reasons for why compliance is like this in the district?
- What would you propose to do about reading in the district? Would you focus on certain supervision areas?

Lecture. There are several ways to set goals.

- First we need to look at the "substantive" goal itself: what level of correct words per minute should we be talking about as a first step in implementation?

- One is to look at the pattern of variation in the data themselves. While still looking at Overheads 12:5 and 12:6: Are there schools doing pretty well that have no huge particular privileges? Or, that strike you as a goal that requires some effort but is clearly not un-doable?

- Another is looking at international norms from somewhere. One example is from the US. Refer to Overhead 12:6.

- Now we have to set some thresholds. Refer to Overhead 12:7. If less than X% of kids in a school are reading less than 20 cwpm, we intervene.

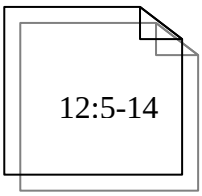
- But, intervention is expensive. So we want to make absolutely sure that there are less than 80% of kids reading. That a first threshold. And it avoids risk of high cost to the government or the quality assurer.

- How many non-reading kids do we have to observe at a school before we conclude that for sure they are below the 80% threshold?

- Well, fine, but the problem is that the more non-reading kids we observe, the more sure we can be that we are indeed not wasting money on schools that don't need so much help.

- But then we run into an opposite problem: in doing so we might neglect some schools that do need help.

- So we need a 2nd tolerance level, usually set at 50%, to make sure we don't dis-include schools that need help.



STEP 2: (Lecture) Determine sample size needed. Show Overheads 12.9 and 12.10. Explain carefully, reiterate issues. Tell them that this is difficult area to understand, and if they want they can just remember two magical numbers: 20 and 6. Need a sample size of 20 and need 6 or more kids are not reading to signal a school (or any unit in the system) in need of intervention.

STEP 3: (Lecture and activity). Determine which units need intervention. Refer to Overhead 12.11 which summarizes where we have been. Then say that next step is to classify the schools. Show and discuss Overhead 12.12 and then let them do the exercise as described in Overhead 12.14. This should be self-explanatory.

For this activity, distribute LQAS Excel Exercises 12.2., 12.3, 12.4.

STEP 4: (Lecture and Activity) Use LQAS to estimate actual degree or level, not just compliance or not. Now we will be working on compiling data from the individual supervision areas and analyzing it to draw conclusions about the average level or degree of compliance or reading levels. This is not that different from what we have already done when we learned to calculate averages, but it is a little different.

12:15

All that is required is that for each school, where we sampled 20 children, we also know the total size of the Grade 2 enrolment. That allows us to know how many other pupils the chosen 20 "stand for" or "represent." We then use those numbers as "weights" in our calculations. All you need to do is multiply each wcpm (words correct per minute) average at each school times the enrollment at that school, and then divide the total enrollment.

For this activity, distribute LQAS handout 4.

Session 13: Data interpretation, use, and target-setting

PURPOSE: The purpose of this session is for participants to interpret survey findings, specifically to identify priorities, set targets, and make policy recommendations (remedial interventions)

TIME: 2 hours.

OBJECTIVES: After completing this session participants will have:

- Identified the main characteristics of their research findings;
- Made a set of policy recommendations (remedial interventions);
- Set targets based on their recommendations

PREPARATION: For this session you will need to have approximately 4 sets of survey results. These results should already be the form of calculated indicators. Make copies of main findings (presented below) from the EGRA baseline assessment report for each participant (Refer to Overhead 13.2)

DELIVERY: **STEP 1:** (Introduction) Review that participants have now learned nearly all the steps in survey research (show them the course outline or research cycle overhead if you have it readily available). They have designed appropriate research questions, selected random samples, designed and piloted questionnaires, compiled their findings into raw data, and analyzed their data. The last, but perhaps most important step in the research cycle is how we do we share and use our research to inform policy and programmatic decisions that improve education in our districts, whether it be reading ability, teacher attendance, school resources, completion rates, or any issue we have identified?

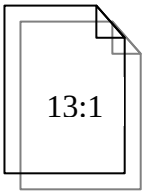
There are two sessions that will examine this last step of data use. The first session will focus on how to interpret findings by setting targets, identifying priorities, and making policy recommendations (designing remedial interventions). The second session will focus on how to share research findings. It will go over simple and effective graphics, reports, and effective communication techniques. In the first session groups will interpret findings, in the next session, groups will present their interpretations.

For this first session participants will be divided into groups of four. Each group will be given the analyzed findings of a study. In their groups, they will go through a series of questions to guide them through research interpretation, target setting, and policy recommendations.

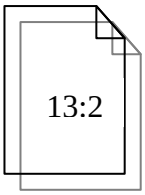
Groups will have 45 minutes to discuss these questions and come up with responses. Then each group will have 5 minutes to present their findings to the entire course. Each group should have access to a flipchart, calculator, and markers.

Note: If the surveys are on different topics, like reading, school safety, teacher education, etc, groups can form based on their interest or knowledge of these topics. This would allow for greater expertise when it comes to recommendation and target setting.

STEP 2: (Lecture) Display the list of questions in Overhead 13.1 and explain and model each one. (45 minutes)



A. The first question asks you to use the survey results to **identify main characteristics and findings** from the survey results. How would you answer the research question(s)? What stands out in the findings – are there indicators with very successful results, or very worrisome results? Are there inequalities between geographical areas or large gaps between girls and boys or ethnic groups? What would you say are the two or three most noteworthy results?



Refer to the survey results in Overhead 13.2 and answer these questions looking at the results. You can start by suggesting things from the findings and then ask participants to add to your comments.

Main findings from the EGRA Baseline Assessment include:

- 92% of surveyed students reported that they attended pre-school education;
- 87% of students are assisted with homework at home;
- 78% of students reported that they reading material available at home;
- 0.5% of students speak English at home; 15.3% of students speak Kiswahili, while 84.3% of students speak their respective mother tongue;
- On average, students can recognize 4.7 correct letters per minute in Kiswahili; while in English this scores is 22.7 correct letters per minute;
- On average, students read 11.7 correct words per minute in disconnected text in Kiswahili. In English, the average is 7.5;
- With respect to fluency in Kiswahili read on average 10.2 cwpm while the average in English is 11.4;
- Out of 5 correct comprehension question answers, students on average responded 0.4 correct questions in both English and Kiswahili;
- 21% of students were able to recognize more than 25 correct words per minute in Kiswahili language. In English, 9% of students were able to recognize more than 25 correct words per minute

B. The third question asks us to apply our priorities toward **establishing recommendations for policy and program actions**. What policies and programs make sense in response to the priority areas? Ask participants for their suggestions.

Some recommendations might include:

- Reading fluency interventions throughout the region. Preferable low cost and requiring minimal teacher training. Small group reading, reading comprehension questions, individual reading aloud, and daily read-along story time might be good program interventions.
- An evaluation of teacher qualifications, teaching practices regarding reading, and reading resources should be conducted.
- The district should implement a policy that every first grade teacher be a fully qualified teacher, with at least 5 years teaching experience, and demonstrated success in the classroom.

C. The final question asks us to **establish targets** for the indicators we hope to improve through the policies and programs recommended above. Remind participants what targets are and why they are important. **Targets are specific, tangible goals for a project. They allow us to identify where we want to get and then to monitor how well we are doing at getting there.**

Targets should be realistic and based on real information about the student performance. It is generally useful to first identify where you want to be by the end of a project and then set annual interim targets. Projects generally should have between 1 and 4 targets. Too many targets become a burden to monitor. Targets can be based on inputs, processes, outputs, or outcomes.

13:3

13:4

Let's look at a couple of examples on how to set targets. As mentioned, one should always start with the real data. If we look at an example from our EGRA schools, we can see that on the letter recognition task in English, students can recognize 23 correct letters per minute on average (Overhead 13.3). Ask the participant if this average of 23 (22.7) correct letters per minute is desired performance? Ask if they knew what should be the performance of second graders on this task? What are the benchmarks for the US in different grades? One could note that the benchmark in the US even for pre-unit is 27. In grade 1 and 2 it is not even benchmarked, since it is assumed children will completely dominate this task. Similarly with connected text. Children in the middle of Grade 2 were reading about 10 and 11 words in Kiswahili and English, respectively, when in the US, whereas the benchmark for the middle of Grade 1 in the US is 20. It is interesting to note what the maximum performance amongst the treatment schools was. These are often above the US benchmark. So it suggests that this kind of thing is possible, as these are not particularly privileged schools.

Next, ask the participants to look at the Overhead 13.3 and describe the performance of schools as compared to DIBLES benchmarks? What do they see? Based on this information, can they set some targets for the short term? For instance, to bring those schools that are below average up to the level of 69 correct words on average. What about those schools that are good performers? Can their performance serve as targets for poor performing schools? The participants should say 'yes'.

If some of the schools can perform at this level, then it should be possible to have all schools perform at that level as well?

Now, take this discussion one step further and ask what would be the long term target for this task? One way to address this issue is to look at the maximum results that could be achieved on the test administered. Refer to Overhead 13.3, part B. For passage reading in English, in the middle of grade 2 students should be able to read at least 60 correct letters per minute. If we go back at Dibles benchmarks, this target is at 68 correct letters per minute. The highest score on this task in these schools was 36.

What step was the most difficult? What was the easiest? What went well or didn't go well? Do they feel like they were able to link each step to the next so that in the end their recommendations and targets were firmly grounded in research findings?

SESSION 14: Sharing research findings and analysis

PURPOSE: The purpose of this session is for participants to deepen their skills in sharing survey findings. In particular, participants will learn about graphical presentation of findings, report writing, presentation skills and audience.

TIME: 4 hours

OBJECTIVES: By the end of this session participants will have

- Created pie, bar, and line graphs;
- Created a table;
- Reviewed a survey report format;
- Discussed effective presentation skills and audience;
- Presented research findings, priorities, recommendations, and targets.

PREPARATION: Each group will need a flip chart, ruler, calculator, and markers.

DELIVERY: **STEP 1:** (Introduction, 10 min). Let participants know that this is the last session of the workshop. Reviewing the research cycle, tell participants that the last stage in the research cycle is one of the most important: sharing and using your findings.

Ask participants why sharing and using your findings and interpretations are perhaps the most important stage in the research cycle.

Be sure the conversation covers the fact that without sharing and using findings all your research goes to nothing. Remind them that part of their definition of applied research was that the research be used to respond to challenges and questions. In the case of this workshop, our research is geared toward helping us improve the quality of education district by district.

Go over what participants will be doing in this session.

The end goal of this session is that the groups that worked together to interpret findings in the last session present their findings and interpretations to the plenary. The presentations will be 10 minutes in length and will go over the four interpretive stages: main findings, priorities, recommendations, and targets, using skills that will be developed in this session, namely creating graphs and tables, a report format, and public presentation skills. After lecture and discussions groups will have time to develop their graphs and tables and plan their presentations. The last hour of the session will be for the presentations themselves.

STEP 2: (Lecture and discussion combined together, 30 min). In this step you are going to discuss the idea of **audience**. Before beginning to produce reports, create presentations, or develop other methods of sharing information, you should always think about your audience. Your audience is those groups and individuals to whom your research is meaningful and useable. Often times research findings will have more than one audience.

Let's say you do an assessment of student reading, who would be interested in your findings?

Be sure to cover district education officials, district education board, non-education district officials, school directors and teachers, school-management committees, parents, and also maybe children themselves, and national education officials.

These are the main stakeholders in education: local, regional and national officials in education and outside education, school personnel like teachers and principals, communities and parents, and students. When you are thinking of how to share your findings you need to keep the appropriate audiences in mind because different audiences use and understand information differently.

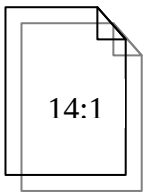
For our reading assessment.

What might be a good way to share our findings with district officials outside education? (Report, presentation, conference or seminar)

What might be a good way to share our findings with parents? (Poster, community meeting, brochure)

What might be a good way to share our findings with teachers and school directors? (Staff meetings, handout, trainings, poster)

What might be a good way to share our findings with national education officials? (Report, presentation, conference or seminar)



Refer to Overhead 14.1 and discuss these ideas in plenary. Throughout this discussion give hypothetical examples and ask for participants' ideas.

- What language and vocabulary is appropriate? What language or languages do the people you want to reach speak? Can you produce publications in those languages or translate into those languages? Can people who speak those languages lead the meetings, presentations, or conferences? How advanced should your vocabulary be? What sorts of words and ideas are familiar and understandable?

- How much detail should be given? Is this audience a technical or a lay audience? Are they interested in the methodology? Are they only interested in the findings? Or in the policy recommendations? How long should your method of communicating your research be for this audience?

- What, in your findings, is meaningful to this audience? Why do they care about what you found? Let them know why your findings are important to them.

- What part of your findings should you focus on? Why do your findings matter to this audience? Emphasize the ideas, findings, and recommendations that matter most to this audience. What is different or ground-breaking to your audience?

- How can you get your information to the audience? Where is your audience? How can you reach them? Are they difficult or easy to access? Are they likely to read what you publish or come to a meeting you organize? How can you get to people who are unlikely to do these things?

- How do you expect your information to affect the ideas, feelings, or actions of your audience and what does this mean for how you present it? What do you want them to do with the knowledge you share? Let them know what they can do. Present your information in a way that will encourage them to take the action you want.

STEP 3: (Lecture + Exercises, 1 hour and 30 minutes**)** Once you have thought about who your audience is and what sort of alternatives are appropriate for that audience, you need to design and develop publications, presentations, or other media that you will use to share your information. Now you will work with course participants on using graphs and tables to share your information.

14:2

A. Explain that different types of graphs are used for different purposes. We are going to go over three types of graphs in this session: **line graphs, bar graphs, and pie charts**.

Point out that normally graphs and tables should be done using a computer. The most common software to make graphs and tables is Windows Excel. After explaining different graphs, develop a few of them by using Excel.

i. **Line graphs** are best used to show changes in a variable over time (trends) or in general when the horizontal axis is a continuous variable (year, age, grade in school). In the example, the horizontal axis represents time and the vertical axis plots the value of some variable. Because they show trends over time, line graphs are useful for monitoring reports. You can plot one line on the graph, or multiple lines on the chart but remember to keep it simple and easy to understand visually. Typically, one never uses line graphs for variables on the x axis that are categories. When using line graphs to illustrate different time frames, make sure that the intervals are the same.

Display Overhead 14.2 of a line graph. Point out the title, horizontal and vertical axes and their labels, legend, and the lines themselves. (Facilitators: this chart can be found in Excel Exercise 14.1.)

Instructions: 10 minutes

Exercise: 30 minutes

Point out that the information given on the graph should make it easy to understand quickly. The title of the graph should explain clearly what the graph shows, the legend should lay out what each of the lines represent, the axes should be carefully titled, and the visual display clear and simple.
Ask participants to interpret the meaning of the graph. For example, ask a few guiding questions like how would they interpret the graph? What is the main message they get out of it? How does girls' reading compare to boys'? What has been the trend over time? Is the graph easy to understand or not? Is it nice to look at or not?

14:3

ii. **Bar graphs** are usually used to compare different groups. Usually the x-axis lists the different groups being compared. The y-axis shows the corresponding value for each group. The same guidelines apply as with any other graph – use clear full titles, label your axes, use a legend if you need one, and keep the graphs simple. Bar graphs should generally be used for comparing groups, or when there is some other non-continuous category on the horizontal axis, such as regions.

Refer to Overhead 14.3 of a bar graph and again go over the title, x- and y-axes and labels, the legend, and the bars. (Facilitator: this chart can be also found in Excel Exercise 14.2)

Instructions: 10 minutes. Exercise: 30 minutes

Ask participants to interpret the meaning of this graph. How would they interpret the graph? What is the main message they get out of it? How do the different school groups compare to each other in terms of their performance on reading fluency task? Is the graph easy to understand or not? Is it nice to look at or not?

14:4

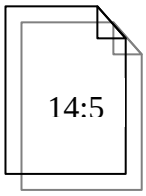
iii. **Pie charts** display the contribution of different pieces to a total. They show percentages as part of whole, like pieces of a pie. The percentages must add up to 100. Pie charts are good to show percentages and to make comparisons.

Refer to Overhead 14.4 and review how to read a pie chart including reading the legend and title, comparing the slices of the pie, and interpreting the written percentages. Developed like this, the pie chart violates one of the basic rules, namely that the graph should show data in a way that a table cannot. Pie charts such as the one presented in the overhead 14.6A. use up a lot

of space to show just three data points. They can, however, be used to compare different sets of percentages fairly effectively. (Refer to Excel Exercise 14.3)

Instructions: 10 minutes. Exercise: 35 minutes.

For each of the two charts in Overhead 14.4: ask participants to interpret the meaning of the pie chart. How would they interpret the chart? What is the main message they get out of it? Is the chart easy to understand or not? Is it nice to look at or not?



B. **Tables** list data. Like graphs, tables can highlight changes over time or compare different groups. Tables allow you to support statements and arguments in text, and list large amounts of data in a small space and clear manner. While tables can display more information than a graph normally, they are also generally harder and slower to understand than graphs. Explain that unlike graphs, which frequently have one or two main messages, tables can contain many different messages and interpretations.

Refer to Overhead 14.5 and review the table with various indicators.

Instructions: 10 minutes. **Exercise: 30 minutes.**

Ask participants for their interpretations of the table. What is the student performance on reading in connected text in Kiswahili? What is the student performance on reading connected text in English? How does the performance on reading connected text compare across two languages? What is the student performance in letter recognition in Kiswahili? What is the student performance in letter recognition in English? Is the table easy to understand or not? Is it nice to look at or not? What makes it easy or hard to understand or nice or not nice to look at?

STEP 4: (Activity – 40 min). Now that participants are familiar with different types of graphs and tables, how to create each, and what they are useful for, they will create them using the same datasets and findings they used in the last session to identify main findings and priorities and set recommendations and targets. Use Excel Exercise 14.4 for this.

Have participants meet back in their groups and, reviewing their main findings, priorities, recommendations, and targets, choose one subject for each of these visual displays (line graph, bar graph, pie chart, and table). Give groups 40 minutes for this exercise. Remember to walk around and guide groups on how to develop the charts. Each group should develop graphs as specified in Excel Exercise 14.4.

Review the primary uses of graphs and tables:

- **Line graphs** illustrate changes over time
- **Bar graphs** compare different groups
- **Pie charts** show pieces of a whole
- **Tables** display large amounts of information concisely

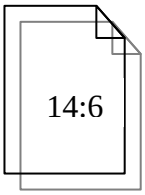
Remind participants that their visual displays should not be chosen haphazardly, but rather should support the main arguments they will be making in their presentations. How can they show the main findings clearly? How can they illuminate their chosen priorities? How can they clarify their targets?

STEP 5: (Lecture and discussion, 20 min) In this step you will be reviewing a standard format for a report or presentation and effective presentation skills.

A. Report and presentation format

Ask participants to call out ideas about information or sections that should be included in a report on survey research?

Write their responses on a flipchart. Organize these responses into the main sections of a report.



Refer to Overhead 14.6 on report/presentation format and review how their responses fit into the format on the overhead.

Review what should be included in each of the report/presentation sections:

Summary: This section should summarize the study as a whole, briefly reviewing each of the subsequent sections and laying out the main policy or intervention recommendations.

Program overview: This section should be included if your survey research is on a particular program. If not you could include an optional background section. The program overview section briefly describes the locations, objectives, activities, and beneficiaries of the program or project or intervention that was analyzed.

Problem statement. If the research was aimed at producing information on a particular problem or issue, state the issue or problem that was under research and why it was deemed important.

Methodology: Here you want to describe the main specific research questions (not just re-stating the broad problem), and how you carried out the research. The methodology section is important as the validity of your findings depends on how the research was carried out. In this section you should include the sample size, how the sample was chosen, and the questionnaire or assessment that was used.

Main findings: This section presents your indicators and interprets their meaning. Here you can highlight findings and priority areas.

Conclusions, recommendations and targets: In this section you list the main conclusions as well as the recommendations and targets you established based on your findings and priorities. For each priority identified in the previous section you can list the recommendations to address it.

Appendix (for report only, not for presentation): In the appendix you can include things such as additional information on the sample, copy of tabulation tables for LQAS, methodologies for calculating indicators, or other information you think should be available to readers but does not need to be in the body of the report.

B. Presentation skills, (**20 minutes)**

Refer to Overhead 14.7. Participants can enhance their presentation skills through much practice. However, below are some tips on how to give a good presentation. Go over the tips below with the participants one-by-one and give an example for each.:

- Show up early and start your presentation on time. Showing up early will allow you to ensure that your presentation is set up correctly; to greet your audience who might also arrive at the venue early; and to pass out the handouts that will accompany your presentation. Not being late is also a symbol of respect for your audience.

- Start by giving a brief overview of your presentation so that your audience will know what to expect. For example, you can start by giving a brief snapshot of the research question you are trying to answer; why it is relevant to your audience; and what solutions you might provide to address these issues.

- There is no need to apologize at the beginning of your presentation. For example, if you had stomach flu last night and might not be able to perform as well as you can today; there is no need to share this information with your audience.

- Provide your audience with a copy of your technical report so that they can read and refer to it after your presentation. You might not be able to present all the details of your research findings in the limited amount of time that you have for your presentation. Giving your audience a copy of your technical report will enable them to look into more detail a specific point you brought up during your presentation or to help answer any clarifying questions that the audience may have (e.g. the methodologies which you used to calculate specific indicators).

- Give your audience a piece of paper so they can take notes. You know the subject of your presentation best so your audience is

likely to have questions and/or comments that they would like to share with you. Giving your audience a piece of paper will also enable them to jot down any thoughts that might be helpful to them as you are giving your presentation.

- Think the very best of your audience. Be very careful how you characterize your audience. Oftentimes, presenters have a tendency to underestimate their audience. Your audience deserves tremendous respect! To demonstrate that you respect your audience, it is important that you know your subject material well and present the information to the best of your ability and to accommodate your audiences' needs.

- Humor makes things memorable, changes the pace of your presentation, and gets people's attention. However, do not alienate your audience and keep in mind that people are sensitive. Therefore, select how you would incorporate humor in your presentation appropriately and carefully.

- Avoid masculine pronouns exclusively. Instead use words like "the participant", "the user", "the students", "they", etc.

- Be appropriately expressive. Demonstrate that you truly believe in your subject area and/or the content of your presentation. Your body language speaks a thousand words and it conveys your enthusiasm and passion. If it is honest, your audience will know it.

- Practice, practice, practice because practice makes perfect. It might also be helpful to watch a videotape of yourself giving the presentation as we oftentimes do not know the various "bad" habits we have when we are speaking in front of an audience. Try to avoid word "place holders" such as "umm", "you know", etc.

- Speak slowly and clearly. Oftentimes, people have a tendency to speak faster than they normally would when they are nervous or speaking in front of a crowd. Try to be mindful of that and pace yourself when you are presenting while staying on time.

- Finish early. Finishing early (e.g. 15 minutes) will give your audience an opportunity to discuss the topic of your presentation amongst themselves and/or to ask you follow-up questions.

STEP 6: (Activity, 1.5 hour). In this step groups will be meeting to prepare their presentations to the plenary. Have participants meet back in their groups to organize their presentations. Ask them to follow the standard format as you reviewed. Give them 30 minutes for this task. Remind them that they should have nearly all the information – the main findings, priorities, recommendations, and targets, and they have the tables, charts and graphs made up so they just need to organize this information and perhaps think of a background and conclusion section.

Have groups also think of how they are going to present. Will one person present each section? Will one person or a few people present the entire presentation?

STEP 7: (Presentations, 1 hour). Give each group 10 minutes to present their work. After each presentation allow a couple of minutes for comments, critiques, questions or suggestions from other course participants. You should also be familiar with the cases and be able to make comments and suggestions.

STEP 8: (Closing, 30 min). In this closing step thank participants for having participated in and worked so hard in this course. Review the course outline with them one final time as well as the research cycle.

Then ask participants to share what they will take out of this course. What do they imagine using? What sort of support might they need?

Write their responses on a flipchart.

Dismiss the course, having participants complete course evaluations.