



THE AGA KHAN UNIVERSITY

**FIRELIGHT
MALAWI**

**MEL Capacity
Building**

**MONITORING, EVALUATION AND LEARNING
MANUAL**

By

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1. Forward



This guide is intended for people managing projects/programmes for Firelight Foundation in Malawi who attended a monitoring, evaluation and learning training in 2017. However, it has been designed to be understood by multiple other users either in the private or public sector. Although it has been designed for use at specific programme level, the basic principles can be applied to projects/ programmes at other levels.

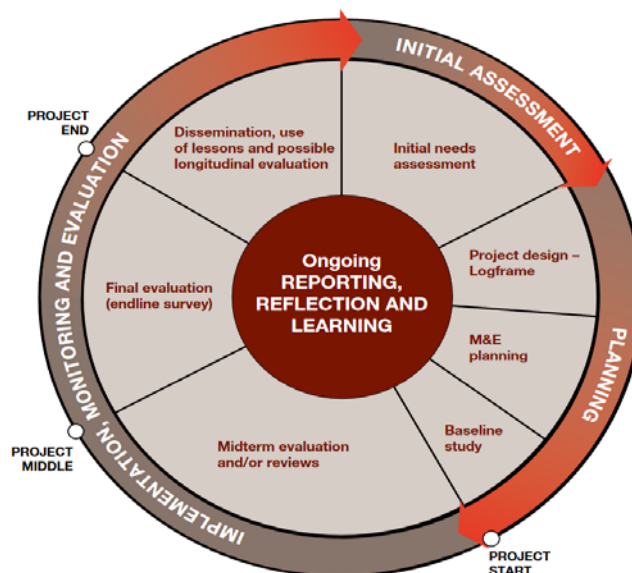
This guide is divided into three parts: Section 1: focuses conceptually on important major MEL concepts and principles; Section 2: focuses on the logical framework approach and its key components. Section 3: focuses on data collection and issues around instrument development and validity and reliability of data. Throughout the manual, an effort has been made to highlight important points with boxes, diagrams, tables and bold text.

2. Key Concepts on Programmatic Monitoring, Evaluation and Learning

SECTION 1

All monitoring, evaluation and learning (MEL) activity are shaped by the programme in question and the design it adopts for its intervention. This is because the major goal of any MEL framework is to report on the results of programmatic interventions. While there is no one way or designing programme interventions, there is a general format followed by most programmatic interventions are tracked and evaluated. This which includes: initial needs assessment, developing a logical framework or MEL plan, conducting a baseline study, evaluation and dissemination of learning.

Figure 1: MEL Activities in the Programme Cycle



Good monitoring, evaluation and learning (MEL) enhances the chances of programmes attaining their goals and for stakeholders to learn if the interventions undertaken or the change envisaged has been achieved and if yes how and if not why? Without effective planning, monitoring and

evaluation, it would be impossible to judge if work is going in the right direction, whether progress and success can be claimed, and how future efforts might be improved. However, for quality monitoring, evaluation and learning to take place it is important that not only a good MEL structure/ framework is in place, but also that those involved understand how it works and its purpose.

This section 1 introduces the readers to key concepts of MEL and explains key definition and principles that underlies each concept and how each of the concepts fits in the overall MEL framework of an organization. Anybody who wishes to engage in any aspect of MEL needs to understand the concepts in this section.

Objectives of Section 1

1. Introduce MEL concepts and principles;
2. Define MEL terms
 - a. Monitoring
 - b. Evaluation
 - c. Learning
 - d. Results based management

1.1 What is Programme Monitoring Evaluation and Learning?

Programmatic monitoring evaluation and learning (MEL) task is to assess the progress, results and lessons learnt of a programme to the greatest possible extent. Its major aim is show evidence that results achieved by the programme are directly associated with programmatic activities and interventions. Programmatic MEL provides programme staff, stakeholders and donors with an operational assessment tool that can be used to assess the extent to which programme goals have been achieved. This is done through linking programme goals with programme outcomes, outputs and activities.

1.2 Concepts associated with Monitoring Evaluation and Learning?

1.2.1 Monitoring

Monitoring is a periodically recurring task that documents results, processes and experiences of a programme. It then uses this information as a basis to guide decision making and learning processes. Monitoring is about checking progress against programme outcomes. The purpose of monitoring is:

1. To learn from experiences to improve practices and activities in the future;
2. To help account for resources used and the results obtained;
3. To support decision making about future programme activities;
4. To account for support given to beneficiaries.

Programmes usually have goals/ intervention i.e. what they seek to achieve within the community. For example: to improve the education of the girl child. This intervention is then translated into specific intervention activities which are expected to produce results that will improve girl child education. These results include expected outputs and outcomes.

Consequently, to effectively monitor a programme one needs to monitor the intervention process (activities) and results (outputs and outcomes) to understand if the programme is being implemented according to plan (activities) and if it is achieving expected results (outputs and outcomes). Monitoring tracks how activities are delivered - the efficiency in time and resources and the use of inputs and resources and its effects and impacts towards its intended results (outputs and outcomes).

Therefore, monitoring that is specific to the programme goals measures the following aspects:

- Activities- how many and for what purpose
- Outputs – what was the immediate effect of activities on beneficiaries
- Outcomes – what was the effect of programme activities on beneficiaries

For example: in the case of a programme goal being to improve girl child education the following could be activities and results that could be monitored:

1	Activities	<ul style="list-style-type: none"> • Student mentoring activities • Financial support to the girl child
2	Outputs	<ul style="list-style-type: none"> • Students attainment of sexual reproductive skills and using them to avoid early pregnancy • Student fees being paid on time hence avoiding their dropout due to financial reasons
3	Outcomes	<ul style="list-style-type: none"> • Increased persistence in remaining in school • Improved transition rates

Monitoring also focuses on other management and contextual circumstances that have a direct effect on the activities (process) and outputs and outcomes (results) of the programme.

The following management and contextual aspects are also monitored in a programme;

- **Compliance** - monitoring ensures compliance with donor regulations and expected results, grant and contract requirements, local governmental regulations and laws, and ethical standards.
- **Context** (situation) - monitoring tracks the setting in which the programme operates, especially as it affects identified risks and assumptions, but also any unexpected considerations that may arise.
- **Beneficiaries** - monitoring tracks beneficiaries who are benefiting from the programme. It includes beneficiary satisfaction or complaints with the programme, their participation, treatment, access to resources and their overall experience of change.
- **Finances** - monitoring accounts for costs by input and activity within predefined categories of expenditure.
- **Organizational capacity** - monitoring tracks the sustainability, institutional development and capacity building in the programme.

While monitoring is done in many different ways depending on the programme and experience of the people working in the MEL office, there are some generally agreed upon best practices of monitoring which include:

Monitoring – Best Practices

1. *Data collected from monitoring activity should be tailored to the target audience interest and needs.*
2. *Monitoring should be systematic, based upon predetermined indicators.*
3. *Monitoring should be flexible and sensitive to unforeseen changes in the programme and its context, including any changes in assumptions/risks.*
4. *Monitoring needs to be timely, so information can be readily used to inform project/programme implementation.*
5. *Whenever possible, monitoring should be participatory, involving key stakeholders – this will build*

1.2.2 Evaluation

Evaluation is assessing, as objectively as possible, a completed programme (or a phase of an ongoing programme that has been completed). Evaluations assess data and information that inform strategic decisions in order to improve the programme in the future. During an evaluation, information from previous monitoring processes is used to understand the ways in which the programme developed and stimulated change.

Evaluations usually help to draw conclusions about five main aspects of the intervention:

- Relevance
- Effectiveness
- Efficiency
- Impact
- Sustainability

Information gathered in relation to these aspects during the monitoring process provides the basis for the evaluative analysis. The evaluation process is an analysis or interpretation of the collected data which delves deeper into the relationships between the results of the programme, the effects produced by the programme and the overall impact of the programme. The major types of evaluation which can occur during the programme are defined under three headings;

According to evaluation timing.

1. **Formative** evaluations occur during programme implementation to improve performance and assess compliance.
2. **Summative** evaluations occur at the end of programme implementation to assess effectiveness and impact.
3. **Mid-term evaluations** are formative in purpose and occur midway through implementation. For programmes that run for longer than 24 months, some type of mid-

term assessment, evaluation or review is usually required by the donor. Typically, this does not need to be independent or external, but may be according to specific assessment needs.

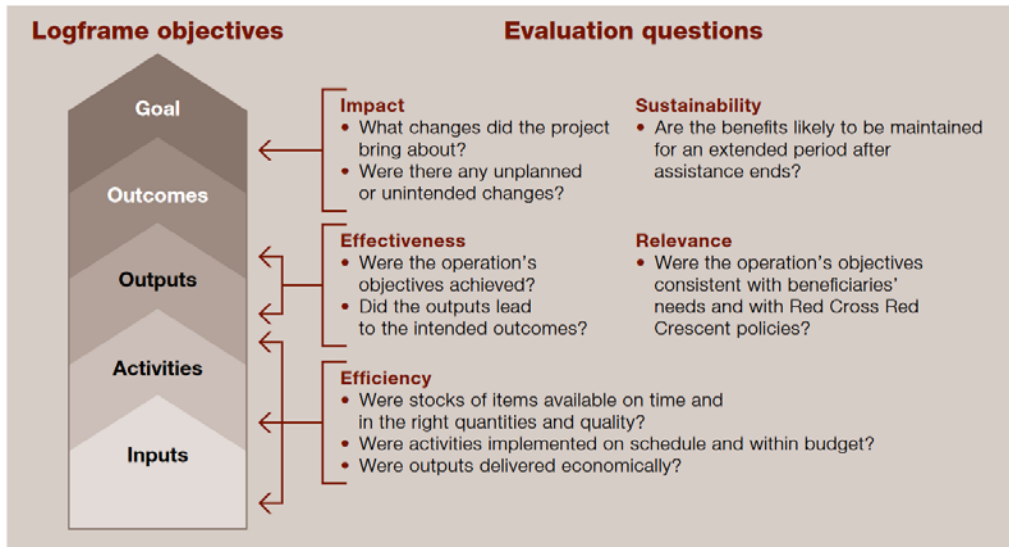
4. Final evaluations are **summative** in purpose and are conducted (often externally) at the completion of programme implementation to assess how well the programme achieved its intended objectives.
5. **Ex-post** evaluations are conducted sometime after implementation to assess long-term impact and sustainability.

Evaluation can be defined according to who conducts the evaluation.

1. Internal or **self-evaluations** are conducted by those responsible for implementing a programme. They can be less expensive than external evaluations and help build staff capacity and ownership. These tend to be focused on learning lessons rather than demonstrating accountability.
2. **External** or independent evaluations are conducted by evaluator(s) outside of the implementing team, lending it a degree of objectivity and often technical expertise. These tend to focus on accountability.
3. **Participatory** evaluations are conducted with the beneficiaries and other key stakeholders. Their aim is to demonstrate relevance and achievement of programmatic goals. They can serve to empower, build stakeholder capacity, ownership and support.
4. **Joint** evaluations are conducted collaboratively by more than one implementing partner, and can help build consensus at different levels, credibility and joint support

Evaluation questions can be asked at all levels of the programme cycle right from inputs to goals in an effort to determine if the various steps in the programme cycle actually did perform according to expectation. See example of questions that could be asked at the various levels:

Evaluation Questions within the Programme Cycle



What is the difference between monitoring and evaluation?

	Monitoring	Evaluation
Why?	Check progress, inform decisions and remedial action, update project plans, support accountability	Assess progress and worth, identify lessons and recommendations for longer-term planning and organizational learning; provide accountability
When?	Ongoing during Programme term	Periodic and after project/programme
Who?	Internal, involving project/programme implementers	Can be internal or external to organization
What programmatic point?	Focus on inputs, activities, outputs and shorter-term outcomes	Focus on outcomes and overall goal

1.2.3 Results Based Management (RBM)

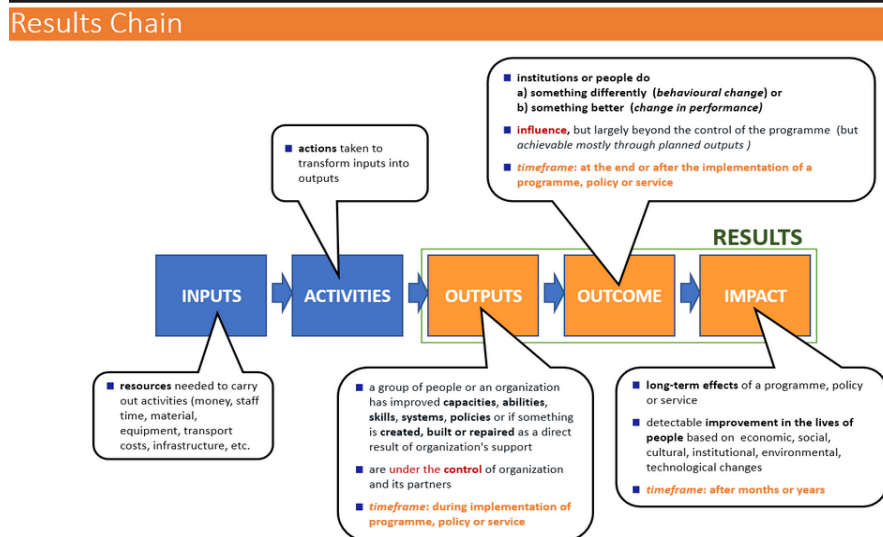
Monitoring, evaluation and learning (MEL) provides a framework for effective measurement of programmatic results. These frameworks provide a new set of tools, that offer programmes methods for ensuring the achievement of their goals. Results-Based approach however, shifts the focus and enables the programme to focus its efforts on monitoring performance rather than just spending, and on evaluating long term results rather than short term outputs. It allows

management to make efficient ongoing assessments about progress towards attainment of the goals and objectives.

Results based management is defined as

“A management strategy by which processes, outputs and services contribute to the achievement of clearly stated expected accomplishments and objectives. It is focused on achieving results, improving performance, integrating lessons learned into management decisions and monitoring and reporting on performance.”

RBM is about selecting a goal first, then deciding on the processes, checking against the goals and making necessary adjustments as required, in order to achieve the desired results. This shifts the focus from mere efficiency of implementing an intervention to a focus on how beneficial the intervention is to targeted people. RBM process therefore demands a continued reflection on activities and outputs and how these improve desired outcomes.



3. Logical Framework Approach

SECTION 2

The logical framework approach is used to help conceptualize and operationalize intended change efforts. The approach helps do this by clearly expressing in clear steps the programme teams understanding of the changes they hope to bring about through their program effort, the activities planned to contribute toward this change, the resources needed to put into the effort, assumptions they are making, and external factors that could influence results.

Objectives of Section 2

1. The purpose of a logical framework
2. The structure of the logical framework
3. Components of the logical framework
4. Measurement in logical framework

The Logical Framework Approach (LFA) is an analytical process and set of tools used to support results-oriented project planning and management. It provides a set of interlocking concepts which are used as part of an iterative process to aid structured and systematic analysis of a programme idea or design. In short LFA is a:

Simplified framework of a programme, initiative, or intervention that is a response to a given situation for which change is sought

Apart from programmatic management, the LFA is a core tool for planning. It serves as a framework and a process for planning to bridge the gap between where you are/ or the community is before an intervention and where you want to be after the intervention. It provides a structure for clearly understanding the situation that drives the need for an initiative (the need/ problem), the desired end state (objective/ goal/ impact/ result) and how resources or inputs

made are linked to activities for targeted people (beneficiaries) in order to achieve the desired results.

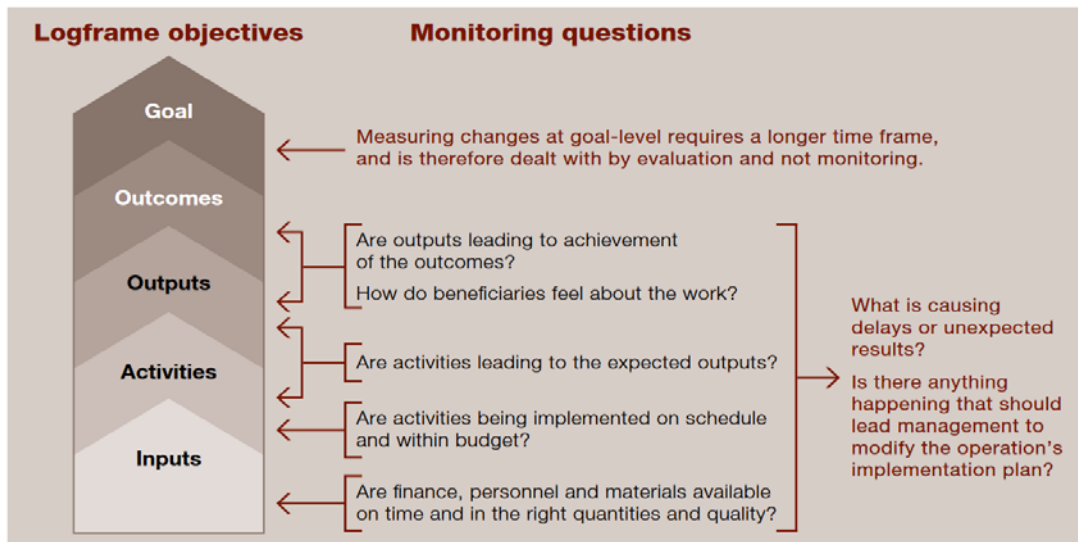
"Planning a course of action, such as managing a programme or an intervention generally implies developing some sort of logic model"

The LFA is a way of describing a programme in a logical way so that it is:

- *Well designed;*
- *Described objectively;*
- *Can be evaluated;*
- *Clearly structured.*

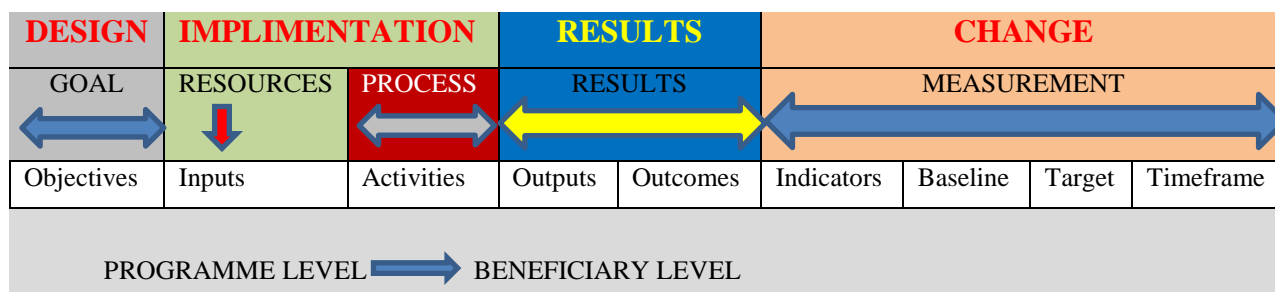
The LFA should be thought of as a tool that helps monitor how a programme is being implemented. It allows programme implementation information to be collected, analyzed and organized in a structured way, so that important questions can be asked, weaknesses identified and decision makers can make informed decisions based on their improved understanding of the programme implementation.

Monitoring Questions and the Logical Framework



The structure of a logical framework

A standard logical framework is divided into two parts. The first part to the right documents the goal, resources, process and results while the second part to the left documents the measurement to be used determine amount of process and result achieved. (See Figure below)



The four rows under goal, resources, process and results, are the long- to short-term objectives ranging from:

- **Goal** (overall aim). The goal articulates the programme design including the intervention strategy, the change and the strategy to be used to bring about the change
- **Outcome** (what will be achieved, who will benefit, and by when). This represents the results envisaged once the output has been achieved.

- **Outputs** (specific results the project will generate). These are the immediate results as a result of the activities.
- **Inputs** (resources needed to support activities needed as part of the intervention strategy). Inputs include human, financial and technological resources.
- **Activities** (what tasks need to be done in order for the output to be achieved).

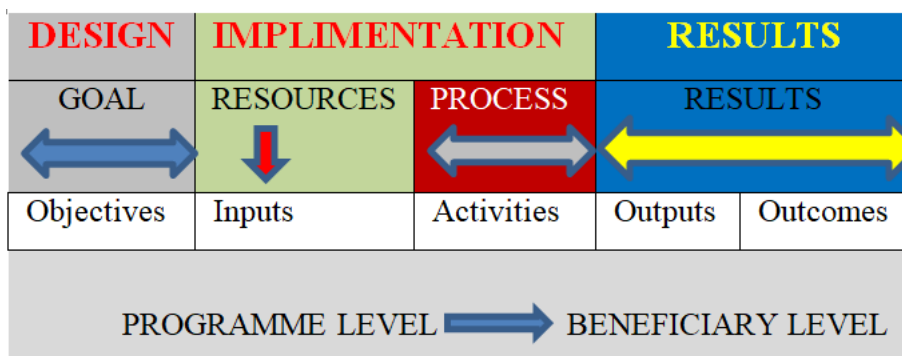
These are measured by the headings from right to left:

- **Time frame** (by when are the specific results or process expected to be achieved).
- **Target** (the results you intend to achieve within a time frame e.g. one year or 6 months).
- **Baseline** (this is what the reality was before the project intervention with regard to outputs and outcomes. It acts as a benchmark to measure if any change has come about as a result of the project).
- **Indicator** (Indicators are a measure of the result. They give a sense of what has been or what is to be achieved).

The goal, resources and process are very much the work of programmes (intervention) but the results are felt and influence the programme beneficiaries. Therefore the effect of programmatic intervention can only be seen in the changes that beneficiaries experience.

2.1 Components of the Logical Framework

The LFA is divided into programmatic input and output items to the left hand side and measurement items to the right (*see figure ... above*). The rationale for this is so that one can be able to at a glance see if the programmatic inputs and results are actually reflected in the data collected from monitoring and evaluation activities and overall if any change is taking place and at what rate when compared to the baseline (original state of affairs before intervention). The programme input and output items in an LFA generally include goal/objective, inputs, activities, outputs and outcomes/ impact:



2.1.1 Programme Goal:

A critical first step to develop your monitoring project is to clearly define the goals of the project and the objectives needed to achieve the goals. Each goal is usually accompanied by numerous objectives.

- *Goals* are statements that broadly define what your project hopes to achieve. For example, to improve the education of girls.
- *Objectives* are specific statements on how the goals will be achieved. For example, improve girls education by increasing their pass rates, persistence and transition in education.

The programme goal is the purpose of the project, that is, the very reason why the project is needed. The goal describes the expected outcome if the project delivers the expected results, and the assumptions made of the external factors, which must act together with the programme.

The project goal and the results shall be SMART:

- Specific,
- Measurable,
- Achievable
- Realistic
- Time-bound

2.1.2 Programme Inputs

Inputs are very often confused to be synonymous with activities. However, these terms are not interchangeable. Inputs, in simple terms, are those things that we use in the project to implement it. For example, in any project, inputs would include things like human resource (personnel), finances in the form of money, machinery such as vehicles, and equipment such as public address systems among others. Inputs ensure that it is possible to deliver the intended results of a project.



2.1.3 Programme Activities

The activities define the way the project team intends to carry out the project. They are composed of a set of actions to deliver concrete results. The activities will form the backbone based on which a detailed plan of operations will be developed. The plan of operations will include individual work plans of the team members, their responsibility regarding each activity and its sub-activities. Activities are therefore what the personnel/employees do in order to achieve the goals of the programme. In the Firelight project, for example, activities would include things such as conducting having mentoring sessions for students.

2.1.4 Programme Outputs

Outputs are the first level of results associated with a project. Outputs are the direct immediate term results associated with a programme as a result of activities. In other words, they are usually what the project has achieved in the short term. For example, project outputs in the firelight project would be: the number of students who have acquired sexual reproductive skills as a result of mentoring sessions.

Outputs are therefore the initial changes/ results relevant to the programme outcomes that are experienced as a result of the project intervention. Outputs also help us track whether the activities are achieving their desired results (activity results = outputs)

The outputs therefore are the direct results of the activities that are implemented within the framework of the project. The outputs/results are a description of the value of the services/products produced by the project within the framework of what the project stakeholders can guarantee. Outputs are actual, tangible results that are a direct consequence of the project's activities. Several activities are often necessary in order to reach one result/output. Results, as well as the project purpose, should be

2.1.5 Programme Outcome

The project outcome reflects what the project intends to accomplish. The project outcome will reflect the justification for carrying out the project and will summarize the effects it should have. The project outcome should try to define the sustainable benefits to the target group. For instance the project outcome should explain how the initiative will affect the current situation and what difference it will make for the beneficiaries. Ideally the project should only have a single outcome. The number of outcome should be limited to maximum three. Too many project outcomes will typically imply that the project is too complex to manage or that the team is trying to design a long-term programme while calling it a project.

Periodic assessment of the effects from program inputs and outputs, usually initiated after the first or second year of the program and annually thereafter

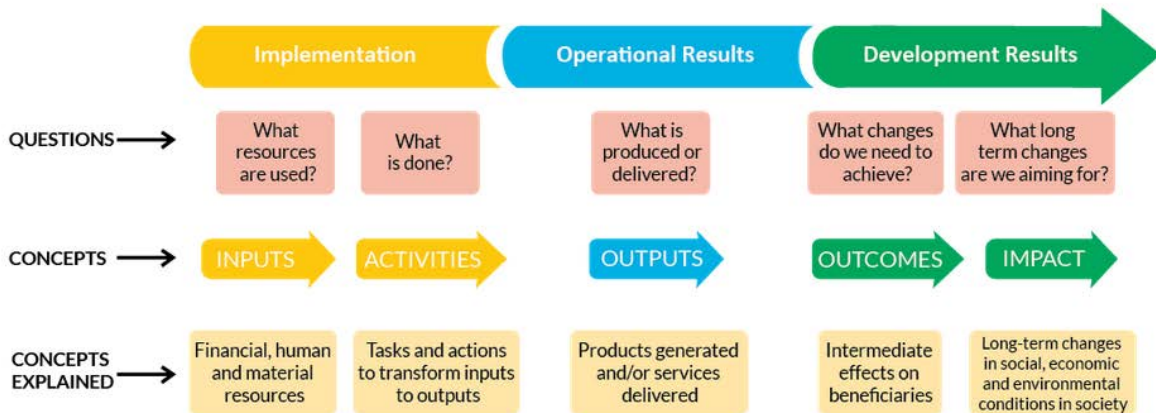
2.1.6 Programme Impact

The programme impact reflects the improvements of a situation in terms of social, economic or any other benefits which respond to identified development needs of the target population under a long-term vision. Usually, several projects will share a common programme goal or impact.

In sum the inputs and activities with a logframe represent the implementation part of the programme while the outputs represent the immediate results of operational results from the activities. The activity itself is not the result but the reason for the activity. For example, while mentoring students is the activity the reason for the activity is to equip girls with sexual reproduction skills – these skills are the operational result of the activity (output). The outcomes

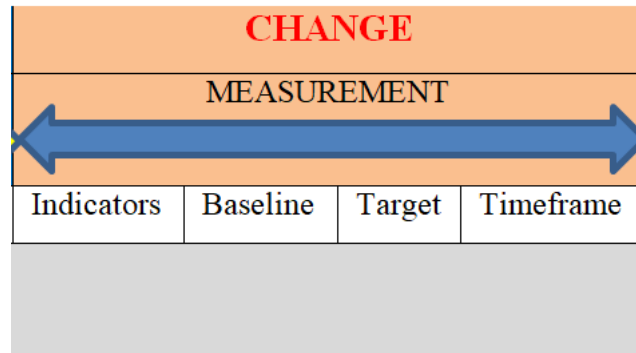
and impact represent results that specifically target the goal of the project and so the changes felt by the beneficiaries. Outcomes represent changes that affect beneficiaries during the life time of the programme while impact are much longer term effects (5 years and above after project life) that affect beneficiary communities. (See figure below)

Figure



2.1.7 Measurement side of the Logical Framework

Measurement is the process of collecting information that helps us know the extent to which our programmatic activities are leading to the changes we want (how effective our intervention is). The information collected is derived from perceptions of individuals, tests that indicate individual's abilities or characteristics about individuals, objects or events etc. This information is then used to attach value (a measure) to programmatic activities, outputs and outcomes in an effort to measure them. The measurement items in LFA generally include: indicators, baseline, target and timeframe.



Measurement is therefore important because it:

Documents the services that are provided by a project or intervention:

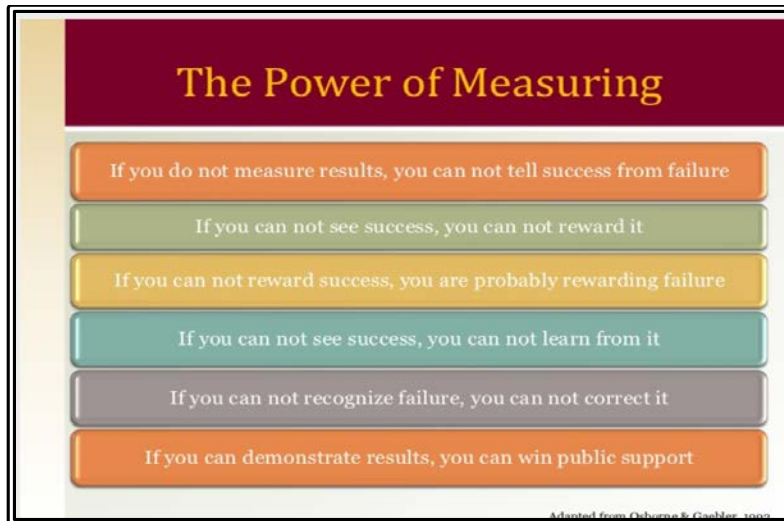
Indicators can be used to track the resources, the activities and their subsequent output and potential outcomes. Information on inputs and activities is essential as a management tool, to determine if projects are efficient and economical, and to inform decisions about whether, and how, to scale up or replicate those that are successful.

Assess whether projects are meeting their goals:

By tracking indicators on outcomes and impacts you will be able to assess whether a programme is delivering the anticipated benefits. By disaggregating outcomes and impacts across different beneficiaries or comparing data indicators can provide information on how benefits are distributed, and highlight areas for improvement.

Ensure that projects are implemented as planned and provide feedback necessary to adjust design:

Programmes almost always experience unanticipated obstacles to implementation especially where inadequate resources, a lack of basic infrastructure and community disempowerment can easily derail programmes. Well-designed activity and output indicators can help managers detect obstacles and take swift remedial action.



The right hand side of the logical framework has the components used to measure the process and results of the programme being implemented.

2.1.7.1 Indicators

An indicator is a value/ measure that is normally used as a benchmark for measuring programme or project outputs. It is “that thing” that shows that an intervention has had the desired impact. It is on the basis of indicators that evidence is collected to show the results or impact of any intervention.

The design of indicators is shaped around determining if the various components of the programme are in sync as expected. That is, are inputs allowing for the necessary activities, are activities leading to necessary outputs and outcomes? Indicators help measure the extent to which activities, activities, outputs, and outcomes are working efficiently to attain expected results that lead to expected programme goals.

Indicators are an important for any programme, particularly for monitoring and evaluation purposes. Some of the benefits of indicators are highlighted below.

1. At the initial phase of a programme, indicators are important for the purposes of defining how the intervention will be measured. Through the indicators, managers are able to pre-determine how effectiveness will be evaluated in a precise and clear manner.

2. During programme implementation, indicators serve the purpose of aiding program managers assess project progress and highlight areas for possible improvement. In this case, when the indicators are measured against project goals, managers can be able to measure progress towards goals and inform the need for corrective measures against potential catastrophes.
3. At the evaluation phase, indicators provide the basis for which the evaluators will assess the programme impact. Without the indicators, evaluation becomes a risky and in many cases unreliable activity.

Types of indicators

The three widely acknowledged types of indicators are process indicators, outcome indicators and impact indicators.

1. **Input indicators:** are those indicators that are used to measure the resources available to a programme. For example, how many mentors are available for students mentoring activities.
2. **Activity indicators:** are those indicators that are used to measure programme processes or activities. For example, how many mentoring sessions were done over the term?
3. **Output Indicators:** Are indicators that measure programme outputs. Outputs are medium impacts of a project. For example, the number of girls who have acquired sexual reproductive skills as a result of attending the mentoring sessions
4. **Outcome Indicators:** Are indicators that measure the long term outcomes of a programme, also known as the project impact. For example, the improved persistence rate of girls in schools as a result of practicing skills they have acquired in sexual reproduction

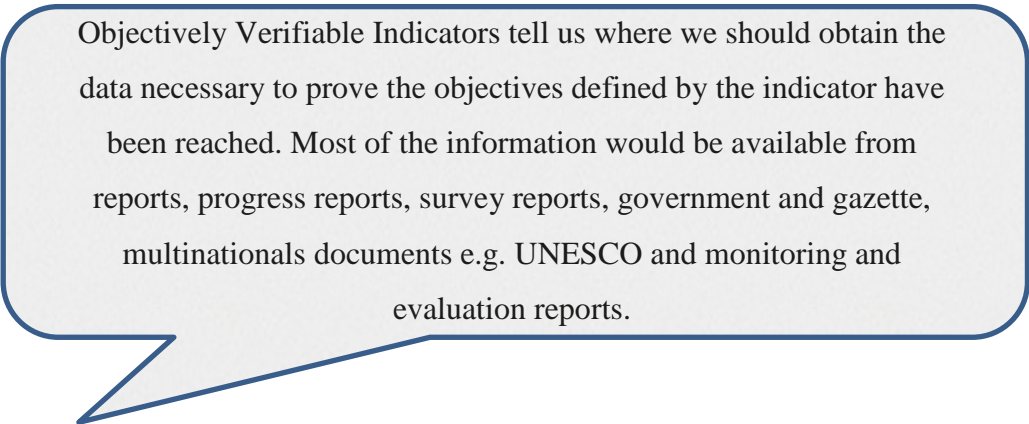
Factors to consider when selecting project indicators

Any appropriate MEL indicator must meet particular thresholds. They must be:

1. **Precise/Well defined:** Probably the most important characteristic of indicators is that they should be precise or well defined. In other words, indicators must not be ambiguous. Otherwise, different interpretations of indicators by different people implies different results for each
2. **Reliable:** Reliability here implies that the indicator yields the same results on repeated trials/ attempts when used to measure outcomes. If an indicator does not yield consistent results, then it is not a good indicator.

3. **Valid:** Validity here implies that the indicator actually measures what it intends to measure. For example, if you intend to measure impact of a project on access to safe drinking water, it must measure exactly that and nothing else.
4. **Measurable:** Needless to say that an indicator must be measurable. If an indicator cannot be measured, then it should and must not be used as an indicator.
5. **Practicable:** In other cases, although an indicator can be measured, it is impracticable to do so due to the cost or process constraints. An indicator must be able to utilize locally available resources while at the same time being cost effective.

NB: Indicators in some cases need to indicate how the information/ data collected can be verified. This is so that the results evidenced by the indicators can be considered as objectively verifiable. Such indicators are known as objectively verifiable indicators.



Objectively Verifiable Indicators tell us where we should obtain the data necessary to prove the objectives defined by the indicator have been reached. Most of the information would be available from reports, progress reports, survey reports, government and gazette, multinationals documents e.g. UNESCO and monitoring and evaluation reports.

Means of verification indicate:

- How to acquire evidence that the objectives have been met
- Where to find proof which will provide the data/information required for each indicator

2.1.7.2 Target

Target refers to the specific, planned level of result to be achieved (e.g. for an indicator) within an explicit time frame. Targets are critical to motivate the project team, establish clear

expectations, and compare with actual performance to assess and adjust project implementation. A baseline value for an indicator is not a target, but helps to inform realistic target setting.

Targets are associated with expected achievement or implementation of activities, outputs and outcomes at different time periods during the course of the project. To establish targets effectively the programme managers should be clear about what can be done and what cannot be done over a given duration of time. For example, not much can be done with students over school holidays and so the managers need to consider this if there are school holidays over a given time. They should also consider the variation of other factors during the programme lifespan:

1. Availability of resources/funds;
2. Staffing;
3. Geographic coverage;
4. Needs among the target population;
5. Order of succession of things with respect to each other.

Targets need to be synchronized with indicators so that the measurement attained is used to determine if a target has been achieved or not. Ideally for long-term projects, targets need to be at least 6 monthly (semi-annual targets) and for short-term projects, they need to be monthly at least.

2.1.7.3 Baseline

Data that measures conditions (using appropriate indicators) before project start for later comparison. Baseline data provides a historical point of reference to: 1) inform program planning, such as target setting, and 2) monitor and evaluation change for program implementation and impact assessment. Without baseline data, it can be very difficult to plan, monitor and evaluate future performance. Baseline data help to set achievable and realistic indicator targets for each level of result in a project's design (e.g. logframe), and then determine and adjust progress towards these targets and their respective results. Additional reasons for conducting baseline studies include:

- Providing a reference point to determine progress and adjust project implementation to best serve people in need.
- Assess measurability of the selected indicators and fine tune the systems for future measurement.
- Uphold accountability, informing impact evaluation to compare and measure what difference the project is making.
- Convince and provide justification to policy-makers and donors for a project intervention.
- Establishing priority areas/planning: Baseline studies are important in establishing priority areas for a project. This is especially true when a project has several objectives. The results of a baseline study can show some aspects of a project need more focus than other while others may only need to be given little focus.
- Attribution: Without a baseline, it is not possible to know the impact of a project. A baseline study serves the purpose of informing decision makers what impact the project has had on the target community. Accordingly, along with other strategies such as use of control groups, it also helps in attributing change in the target population to the project.
- Baseline tools are used for evaluation: the tools used during a baseline study are normally the same tools used during evaluation. This is important for ensuring that management compares “apples to apples”. As such, conducting a baseline means that time and other resources for designing evaluation tools are minimized or even eliminated altogether.

In sum in a logical framework every implementation process and result needs:

Indicator	<ul style="list-style-type: none"> • What is to be measured • How it will be measured
Target	<ul style="list-style-type: none"> • The desired direction or value for progress
Baseline	<ul style="list-style-type: none"> • Benchmark -the starting point • A basis for setting targets
Time bound	<ul style="list-style-type: none"> • A time frame within which results will be achieved

4. Data Collection

SECTION 3

Data collection in MEL is the process of collecting evidence based on indicators. Collecting evidence is about having ‘something’ to show that will prove that the results of your data collection are reliable, believable, valid, and dependable and have credibility. In many cases this comes down to was the data collected from the targeted intervention, from people with direct experience of the intervention, was the instrument used good enough to capture information about the intervention, was the analysis of the data done using appropriate statistical calculations or was the person doing the analysis well versed with the intervention? Data collection in MEL is a critical activity that must be given utmost attention because it shapes the outputs, outcomes and impact of the intervention and all decisions that go with it.

Objectives of Section 3

1. The concept and principles of data collection
2. Link between data collection and indicators
3. Types of data collection methods
4. Sampling
5. Instrument development
6. Validity and reliability of data
7. Data analysis
8. Data presentation

Data collection is a process of collecting information about inputs, outputs and outcomes of your programme as you seek to monitor its implementation. The data is collected from all the relevant sources as indicated by indicators identified during the planning of the project. Before collecting data one must consider:

1. What does the indicator state:
 - a. What is the focus of the data: activities, outputs or outcomes
 - b. What type of data is needed – quantitative or qualitative
2. To what extent is the data I want to collect valid:
 - a. Does it represent reality
 - b. Is it from a source that I have confidence in
 - c. Does the data respond to my objective – monitoring
 - d. Is my tool appropriate for the data I wish to collect.
3. How can I collect the data without significantly interfering with the day today activities of the people or institutions involved.
4. Does the person charged with the responsibility to collect the data understand their responsibility
 - a. Proper use of the tools;
 - b. How to identify and manage key respondents;
 - c. How to record the data.

Data collection methods can be divided into two categories: secondary methods of data collection and primary methods of data collection.

Secondary Data Collection Methods

Secondary data is a type of data that has already been recorded and collected in the schools and communities we work in. this can be found in public sources such as community magazine or school records. While collecting secondary data it is important to ensure the validity of the data by seeking to find out: if it is up to date, who collected is – is it government or another credible institution, quality of analyses etc.

Primary Data Collection Methods

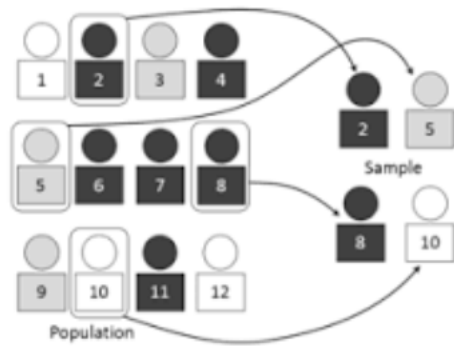
Primary data collection methods are both quantitative and qualitative. Quantitative data collection methods are based in mathematical calculations in various formats. Methods of quantitative data collection and analysis include questionnaires with closed-ended questions, mean, mode and median and others. Quantitative methods are cheaper to apply, can be applied within shorter duration and can be generalised. Moreover, due to a high level of standardisation of quantitative methods, it is easy to make comparisons of findings. For example, every student in a number of schools filling the same persistence questionnaire.

Qualitative research methods, on the contrary, do not involve numbers or mathematical calculations. Qualitative research is closely associated with words, sounds, feeling, emotions, and other elements that are non-quantifiable. Qualitative studies aim to ensure greater level of depth of understanding and qualitative data collection methods include interviews, questionnaires, focus groups, observation etc.

3.1 Sampling

Sampling happens when you have too many people or items that you need to collect data from but the resources at hand and time cannot allow you to collect data from all of them. A sample is used because it is generally cheaper, quicker and more feasible than monitoring the whole population/users of a scheme or facility. The target population is the population/ all people or items that you are interested in. It may be all the households in your community of all parents in a school.

“Sampling ... enables you to make reliable generalisations about the whole target population ... [The representative sample] must mirror the target’s profile.”



In order to be reliable, the sample must be representative. It must mirror the profile of the target population. It is also important to be aware that the size of the sample will affect how confident you can be that the results you obtain are reflective of the target population.

Steps in the sampling process	Recommendation
1. Identify your target community and decide which characteristics are important	1. Consider: gender, economic, geographical location, religion, political characteristics, intervention
2. Decide how to obtain and include a sample that reflects the characteristics you consider important	2. Identify the number of people you want for each characteristic
3. Decide on best way to collect information (data)	3. Develop an instrument that best collects the type of information you want (quantitative or qualitative), is economical and attracts the least bias
4. Collect the information (data)	4. Have a reliable way of recording and storing the information in readiness for analysis

To effectively select a sample with all the necessary characteristics one needs to have access to a sampling frame. A sampling frame includes all names of the people within the population you wish to monitor. For example, if you wish to monitor all students in a school then the school

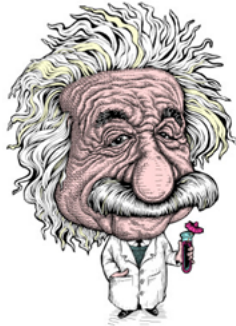
register with all names of students would be your sampling frame. This is important because it is from this sampling frame that you can determine:

- You get information about students who will be part of your sample e.g. their name, class, age etc.
- All major characteristics of the population that you need to cater for when sampling
- You get to know the total population and hence determine how much sample is enough for it to be representative.

3.2 Instrument Development

In some cases there is no instrument available to collect data of your interest. In this case you have to develop the instrument yourself. Your choice on which instrument to use should focus on the tools ability to collect data and measure the inputs, activities, outputs and outcomes as stated in your logframe. There are many types of instruments you could choose depending on the type of information you need. For example:

Instrument	Use
2. Interview	<ul style="list-style-type: none"> • To find out students perceptions about a mentoring talk • To find out parents thoughts about the support provided to their children
3. Classroom observation	<ul style="list-style-type: none"> • To find out how teachers relate to girl students in the classroom • To find out about the participation of girls in the classroom
4. Survey	<ul style="list-style-type: none"> • To find out about the persistence levels of girls in a school from many girls • When you want to reach a relatively large number of participants
5. Tests	<ul style="list-style-type: none"> • When you want to test students skills on a topic for example sexual reproduction knowledge and skills
6. Document analysis protocol	<ul style="list-style-type: none"> • When you want to review information from document e.g. absenteeism from school register



“Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted.” (Einstein)

To be sure that you are using a valid instrument to collect data that you need it is advisable to consider the following steps:

Step 1: Definition and elaboration of the activity/output or outcome intended to be measured

The first step in instrument development is *conceptualization*, which involves defining the key concepts within an activity/output or outcome to be measured. When constructing an instrument you need to think of how to make the concepts and terms you use easy to understand and concrete how it will be practically measured. Such a process is called operationalize. The operational definition of a terms used consists of a statement of specifically how the terms will be measured or implemented in the study. For example if the main concept is transition then we have to ask:

What does transition mean: a move from one class to the next or from one term to the next?

- *Does it include those who repeat and eventually move to the next class?*
- *What of those who failed but because of government policy still went to the next class?*

The intention is to come to an agreeable meaning of the concept transition that will allow us to determine how it can be measured. Agreement results from a clear definition that then leads to an operational definition that allows it to be measured:

Concept	Definition	Operationalization
Transition	The flow of students from one level of education the next	Transition rate = Last year's class – transferred students – Students joining the next class in the next year (same cohort in new class in the next year [excluding any new admissions]) NB: Last year's students = all the students registered for that class at the beginning of the year (cohort)

Defining important concepts in an activity/output or outcome is operationalizing the concept with a view of having a shared meaning and an understanding of what data collection will entail. It gives context to the concept.

A good definition ensures consistency of measurement across many people who maybe collecting data and guarantees data that is similar and that can be consolidated for analysis. The definition of concepts is critical and can affect the validity of data collected if the definition does not correctly fit the important terms and results of activities/ outputs and outcomes. It is therefore advisable to sit with the programme staff when defining concepts so as to have an agreed definition.

Step 2: Choice of measurement method (e.g. questionnaire/physical test)

Measurement is the science and practice of obtaining information about activities, outputs and outcomes of a programme. The choice of measurement is defined in the indicator and design according to the targeted activity, output or outcome. For example:

Focus	Measurement
Behavior	Frequency <ul style="list-style-type: none"> Per day, lesson, hour, month
Attendance	<ul style="list-style-type: none"> Number of people Percentage of expected number of people
Ability / skill	<ul style="list-style-type: none"> Percentage of competencies demonstrated in a task Percentage mark in a test

Types of Measurement

There are multiple types of measurement to consider when thinking about how creating an instrument for data collection.

- **Self-Report.** You can collect information (data) by asking participants to report on their own beliefs, knowledge, feelings, and behavior. Here you try and access their perception about something for example, ask parents about their ability to pay school fees
- **Observation.** You can also observe the behavior of others. For example, if you want to find out about how students participate in mentoring sessions. The best way to measure the frequency of students answering questions or asking questions, how they contribute to group activity and the extent to which they engage in classroom tasks. Typically, observation requires you to either complete a pre-prepared check-list of the presence or absence of particular behaviors or take filed notes describing the behavior of the students during class.
- **Archival Records.** Archival records refer to existing information. For example, if interested in students' pass rates. Depending on the particulars of the information you need, pass rates can be obtained by going into students' school records and collecting their grades from previous terms.
- **Examinations.** Particularly when you are interested in participants' knowledge, it is best to give an examination over the topic. For example, a researcher might be interested in students' knowledge of sexual reproduction. Students likely will not accurately self-report on their knowledge, either because they do not know their level of knowledge, or they might not want to appear ignorant and therefore will bias their responses. Instead of asking them to self-report on their knowledge (e.g., *I understand how to take a pregnancy test*), giving an examination will be more accurate.

Step 3: Selecting and formulating questions (items)

Questions act as a stimulus for participants to provide information (data) about a particular issue. Depending on the question, the questions may be structured where the responses are already provided and all the participant needs to do is select one, rank or tick those that apply. These are

called structured response questions. Questions can also be free response where participants decide on the response they wish to give such questions include: essay questions, interview questions and fill in the blanks questions.

Anyone formulating questions for data collection must have both a thorough knowledge of the targeted activity, output and outcome and their corresponding indicators. This is because the targeted activity, output and outcome determines the content from which the questions must emanate while the indicator dictates the kind of information that needs to be collected. The person must also be aware of the people who will be answering the questions as this will determine the level of language that will be used to ask the questions. Adherence to the above goes a long way to make sure the instrument is collected intended data (validity).

The following are some principles that should be followed when creating items:

- Items should address only a single issue; “double barreled” items such as “My students are dedicated and hardworking” may represent two constructs (dedicated and hardworking) and result in confusion on the part of the respondents.
- It is also important to categorize all items in terms of the construct they seek to derive information about or in terms of methodology if they are seeking process issues or outcome issues. As an example, “My teacher treats me fairly” should not be included in a scale with the outcome “I feel committed to my teacher.”
- Statements should be simple and as short as possible and the language used should be familiar to target respondents. Negatively-worded or reverse-scored items should be used with caution.
- Items must be understood by the respondent as intended by the person collecting information if meaningful responses are to be obtained.
- Finally, remember that repeating items asking the same thing is good because they help confirm if the respondent is actually stating the ‘truth’ and hence being consistent in their responses.

Closed ended items

Type of item	Description
Checklists	Can be used to obtain a great deal of information at one time. A checklist can be used to indicate the presence or absence of something of interest.

Multiple-response items	These items present a problem and offer the examinee response options. Typically these items allow respondents to select more than one response. (e.g., “select all that apply”).
Ranking scales	Used to rank-order things as they relate to one another. For example, in order of importance list the following that improve a girl's persistence rate in her education: teachers, fees, academic performance, family. Should be limited to no more than five items to avoid confusion and misnumbering by respondents
Likert-type scales	Composed of items that ask respondents to rate a statement using a scale, such as 1 = strongly disagree to 5 = strongly agree. The items may yield a total score or several subscale scores.

Step 4: Scoring issues

Many multi-item questionnaires contain 5-point item scales, and therefore are ordinal scales. Often a total score of the instrument is considered to be an interval scale, which makes the instrument suitable for more statistical analyses. Several questions are important to answer:

How can you calculate (sub)scores? Add the items, use the mean score of each item, or calculate Z-scores.

Are all items equally important or will you use (implicit) weights? Note that when an instrument has 3 subscales, with 5, 7, and 10 items respectively, the total score calculated as the mean of the mean score of each subscale differs from the total score calculated as the mean of all items.

How will you deal with missing values? In case of many missings (>5-10%) consider multiple imputation ([Eekhout et al., 2014](#)).

Step 5: Pilot study

Be aware that the first version of the instrument you develop will (probably) not be the final version. It is sensible to (regularly) test your instrument in small groups of people. A pilot test is intended to test the comprehensibility, relevance, and acceptability and feasibility of your measurement instrument

Instrument is the generic term that researchers use for a measurement device (survey, test, questionnaire, etc.). To help distinguish between instrument and instrumentation, consider that the *instrument is the device* and *instrumentation is the course of action* (the process of developing, testing, and using the device).

Instruments fall into two broad categories, researcher-completed and subject-completed, distinguished by those instruments that researchers administer versus those that are completed by participants. Researchers chose which type of instrument, or instruments, to use based on the research question. Examples are listed below:

Researcher-completed Instruments	Subject-completed Instruments
Rating scales	Questionnaires
Interview schedules/guides	Self-checklists
Tally sheets	Attitude scales
Flowcharts	Personality inventories
Performance checklists	Achievement/aptitude tests
Time-and-motion logs	Projective devices
Observation forms	Sociometric devices

3.3 Validity of Data

Validity is the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform. It is rare, if nearly impossible, that an instrument be 100% valid, so validity is generally measured in degrees. As a process, validation involves collecting and analyzing data to assess the accuracy of an instrument. There are numerous statistical tests and measures to assess the validity of quantitative instruments, which generally involves pilot testing. There are two major types of validity external validity and content validity.

External validity is the extent to which the results of can be generalized from a sample to a population. Establishing external validity for an instrument, then, follows directly from sampling. Recall that a sample should be an accurate representation of a population, because the total population may not be available. An instrument that is externally valid helps obtain population generalizability, or the degree to which a sample represents the population.

Content validity refers to the appropriateness of the content of an instrument. In other words, do the measures (questions, observation logs, etc.) accurately assess what you want to know? This is particularly important with achievement tests. Consider that a test developer wants to maximize the validity of a test for class 4 mathematics. This would involve taking representative questions from each of the sections of the syllabus and evaluating them against the desired outcomes.

RELIABILITY AND VALIDITY

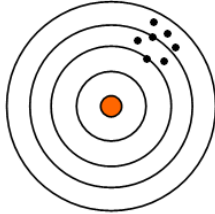
Reliable

"A data collection method or instrument is considered reliable if the same result is obtained from using the method on repeated occasions."

Valid

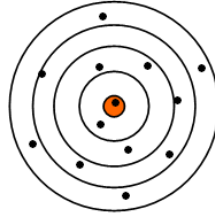
"A measurement method or instrument is considered valid if it measures what it intends to measure."

The meaning and relationships among reliability and validity can be clarified through the metaphor of the target



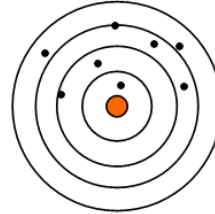
Reliable Not Valid

The target is hit consistently and systematically measuring the wrong value for all cases: it is consistent but wrong.



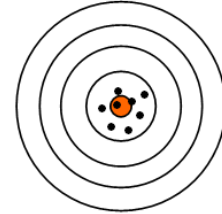
Valid Not Reliable

Hits are randomly spread across the target. On average you get a valid group estimate, but you are inconsistent.



Neither Reliable Nor Valid

Hits are spread across the target and consistently missing the centre.



Both Reliable And Valid

You consistently hit the centre of the target.

Adapted from: Trochim 2001. <http://trochim.cornell.edu/kb/rel&val.htm>

Validity of data can also be strengthened by using multiple sources of data as a way of ascertaining that meaning or information derived from a particular data for example survey is collaborated by another method for example interviews. Such multiple use of data is known as triangulation. Triangulation therefore entails:

- Collection of data from different participants in a prescribed setting, from different stages in the activities of the setting and, if appropriate, from different sites of the setting
- Cross-checking of the consistency of specific and factual data items from various sources via multiple methods at different times
- Combining both quantitative and qualitative data collection methods

3.4 Reliability of Data

Reliability can be thought of as consistency. Does the instrument consistently measure what it is intended to measure? It is not possible to calculate reliability; however, there are four general estimators that you may encounter in reading research:

1. *Inter-Rater/Observer Reliability*: The degree to which different raters/observers give consistent answers or estimates.
2. *Test-Retest Reliability*: The consistency of a measure evaluated over time.
3. *Parallel-Forms Reliability*: The reliability of two tests constructed the same way, from the same content.
4. *Internal Consistency Reliability*: The consistency of results across items, often measured with Cronbach's Alpha.

Relating Reliability and Validity

Reliability is directly related to the validity of the measure. There are several important principles. First, a test can be considered reliable, but not valid. Consider the SAT, used as a predictor of success in college. It is a reliable test (high scores relate to high GPA), though only a moderately valid indicator of success (due to the lack of structured environment – class attendance, parent-regulated study, and sleeping habits – each holistically related to success).

Second, validity is more important than reliability. Using the above example, college admissions may consider the SAT a reliable test, but not necessarily a valid measure of other quantities colleges seek, such as leadership capability, altruism, and civic involvement. The combination of these aspects, alongside the SAT, is a more valid measure of the applicant's potential for graduation, later social involvement, and generosity (alumni giving) toward the alma mater.

Finally, the most useful instrument is both valid and reliable. Proponents of the SAT argue that it is both. It is a moderately reliable predictor of future success and a moderately valid measure of a student's knowledge in Mathematics, Critical Reading, and Writing.

3.5 Data Analysis

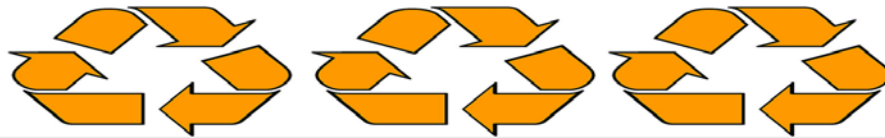
Data analysis is a process of making meaning out of the data collected. Meaning is found by seeking patterns, relationships and differences between the different data collected. For example, are the girls enjoying project support have a higher persistence level that girls who are not in the

project? Are girls in form one having better pass rates than those in form two who have had more than a years support from the project.

NB: the numbers you collect e.g. examination results for each class do not in themselves give meaning it is you who has to make meaning by comparing the data and making sense of it.

What is data analysis?

- **Data analysis is the process of making meaning from the data**
 - It moves from data collection to making meaning and back again in an effort to better understand the data:
 - It is asking – what is this data telling me.



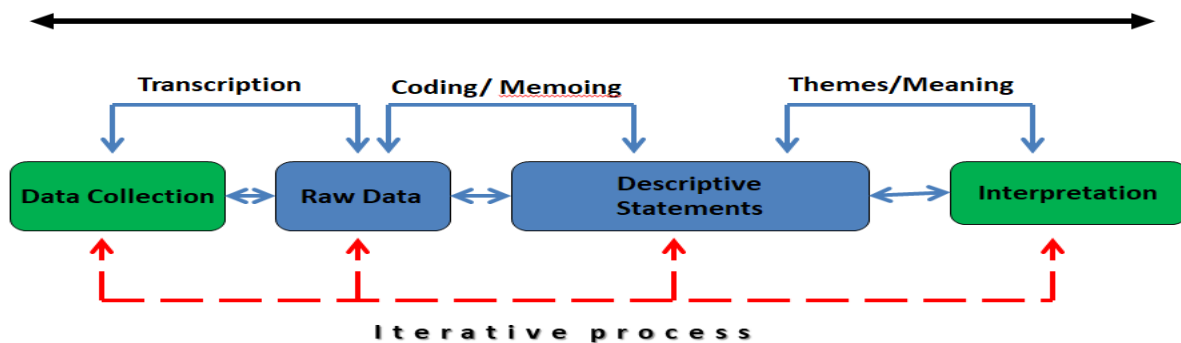
Qualitative Data Analysis

Qualitative Data Analysis (QDA) is the range of processes and procedures whereby we move from the qualitative data that have been collected into some form of explanation, understanding or interpretation of the people and situations we are investigating. The idea is to examine the meaningful and symbolic content of qualitative data. For example, by analyzing interview data and attempting to identify any or all of:

- Someone's interpretation of the world,
- Why they have that point of view,
- How they came to that view,
- What they have been doing,
- How they conveyed their view of their situation,
- How they identify or classify themselves and others in what they say,

The process of QDA usually involves two things, writing and the identification of themes. Writing of some kind is found in almost all forms of QDA. Finding themes is part of the overwhelming majority of QDA carried out today.

The Analysis Process



Qualitative Data Analysis

Qualitative Data Analysis (QDA) is the range of processes and procedures whereby we move from the qualitative data that have been collected into some form of explanation, understanding or interpretation of the people and situations we are investigating. Qualitative Research is used to uncover people's experiences, thought and opinions, and dig deeper into understanding how the project and its activities have affected individuals.

The process of meaning making in qualitative data analysis begins with coding. Coding is applying meaning to given data – from an interview, conversation or observation. Here you ask yourself what did this person mean and what word relevant to the project can I use to capture this meaning.

Coding Data

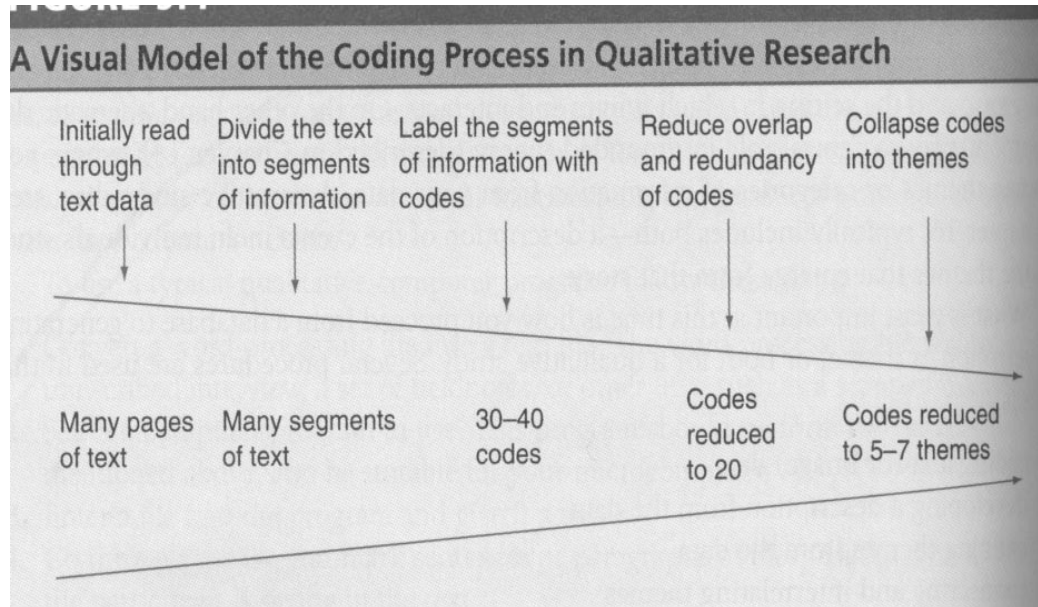
- Open Coding
 - Assign a code word or phrase that accurately describes the meaning of the text segment
 - Line-by-line coding is done first in theoretical research
 - More general coding involving larger segments of text is adequate for practical research (action research)

An example of coding

Coding begins by asking yourself does this data help me make sense of the situation. For example, if the interview is about the usefulness of the study cycle, ask yourself does this statement tell me something about how useful study cycles are – what use does it identify – what word or words best describe that usefulness and then use those as the code. On the left margin we have the coding which is meaning made from statements from the interview and to the right margin is themes which are a combination of a number of codes.

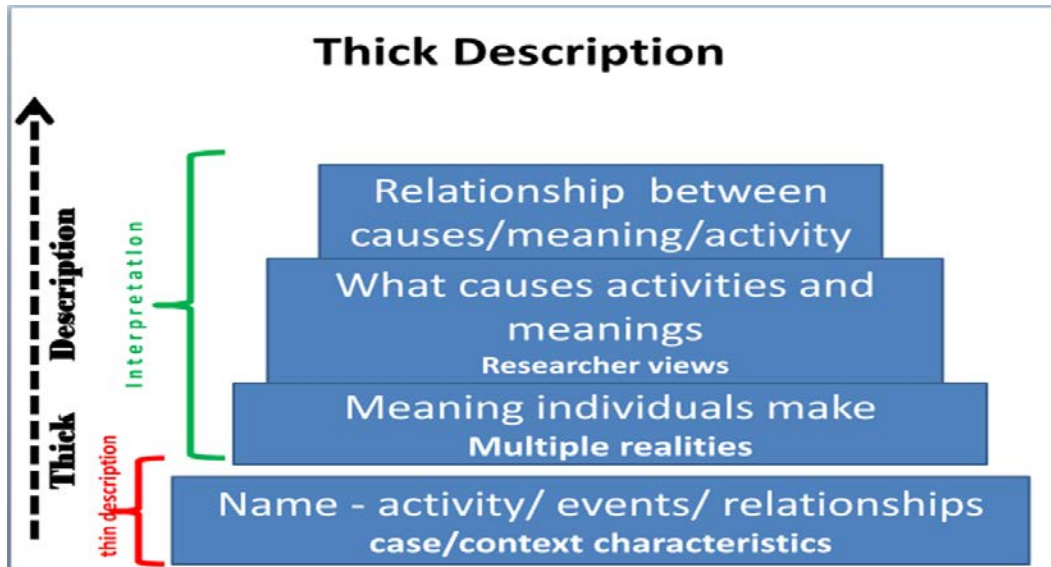
Coding a Page from a Sample Interview Transcript	
Codes Here	Themes (And other Ideas) Here
<p>The Process of Reconstructing Curriculum in a Rural High School Setting</p> <p>JJ: One thing, Lucy, that I've heard talked about was the fact that schools reflect the strengths of communities. What do you perceive as strengths of Greenfield as a community and how that relates to schools?</p>	
Close-knit community	<p>Potential theme: The community</p> <p>Idea: getting a good sense here for the community and its values</p>
Health of community or community values	A good quote
Change is threatening	Potential theme: Leader
Visionary skills of talented People	Idea: returns to description of community again

Coding reduces information or data collected and follows a funnel like process where all redundant data is left out of the interview transcript and only data considered important through coding is considered. (see figure below)



Once the codes and themes have been developed and you are now preparing to present the data you have to ensure the following:

- That you explain the situation that is being analysed. For example, this data focuses on the usefulness of study cycles which was an intervention meant to help students acquire learning skills.
- What meaning did individuals make of the usefulness – remember to capture what a number of them generally said – here you refer to the codes that you developed.
- In your view as a programme member why do you think they thought this way – in this case you can refer to the theme as this was developed by you out of making meaning of the codes.
- Then finally state what is the implication of this thinking to the study cycles – answer to the issue you were trying to understand. (see figure below)



All the above should help in writing a report for the programme team.

Quantitative Data Analysis Process

1 Organizing the data

- Organize all questionnaire in terms of their source e.g. schools,
- Check each questionnaire for completeness and accuracy in the filling
- Remove incomplete questionnaires and those that do not make sense (keep a record of this)
- Give each questionnaire an index number (so you know which data came from which questionnaire)

2. Enter your data / clean your data

- Create a data entry sheet either on Excel or SPSS
- Enter each questionnaire index number so you can easily identify it
- Make sure you provide for responses for each of the questions on

your questionnaire for each or the people who filled one

- Check through to make sure all responses have been filled
-

3. **Decide on analysis and calculation you want to use**

- This will depend on what you want to know

Do you want to know how many individuals checked each answer?	Frequency
Do you want the proportion of people who answered in a certain way?	Percentage
Do you want the average number or average score?	Mean
Do you want the middle value in a range of values or scores?	Median
Do you want to show the range in answers or scores?	Range
Do you want to compare one group to another?	Cross tab
Do you want to report changes from pre to post?	Change score
Do you want to show the degree to which a response varies from the mean?	Standard deviation

4. **Interpreting the information**

- Numbers alone are not enough to tell us what is happening in the implementation of a project. E.g.

“300 girls attended mentoring session in first term 2018”

- Interpretation the process of attaching meaning

“300 girls can avoid early pregnancy because they have been equipped with skills on sexual reproduction (interpretation) - 300 girls attended mentoring session in first term 2018 (evidence)”

Interpretation is the process of attaching meaning to data – but one has to be careful that the meaning given is logical and is based on the data collected.

The meaning provided is what tells us if project implementation is happening as planned. It is what monitoring and evaluation is about.

5. **Learning**

- Interpreting information is about identifying lessons learnt
 - What did you learn about how the project is being implemented?
 - What did you learn about the beneficiaries?
 - What did you learn about the context?
 - What surprised you?
 - What did you not understand and you need more data?

To move forward our learning it is important that we make recommendations and create an action plan to make sure that our learning (questions) is used in future programmatic and monitoring activities

6. **Data presentation**

Major Concepts and Definitions

Graphs and charts condense large amounts of information into easy-to-understand formats that clearly and effectively communicate important points. In selecting how best to present your data, think about the purpose of your graph or chart and what you want to present, then decide which variables you want to include and whether they should be expressed as frequencies, percentages, or categories.

Presenting Findings Visually

Whatever you choose, text, table, or chart (or all three), your visual information should be self-explanatory. Any headings should be clear and informative. Any text accompanying a table or chart should reference the key points you want to highlight, but the visual should be understood even if the text is not read.

Text	Tables	Chart
Use when your key findings include only a few data points.	Use when your key findings lie in structured numeric information (more than three or four numbers)	Use when your key points lie in the relationships between numbers -- demonstrating trends or making comparisons.

No matter which visual display you use for your data, keep these things in mind:

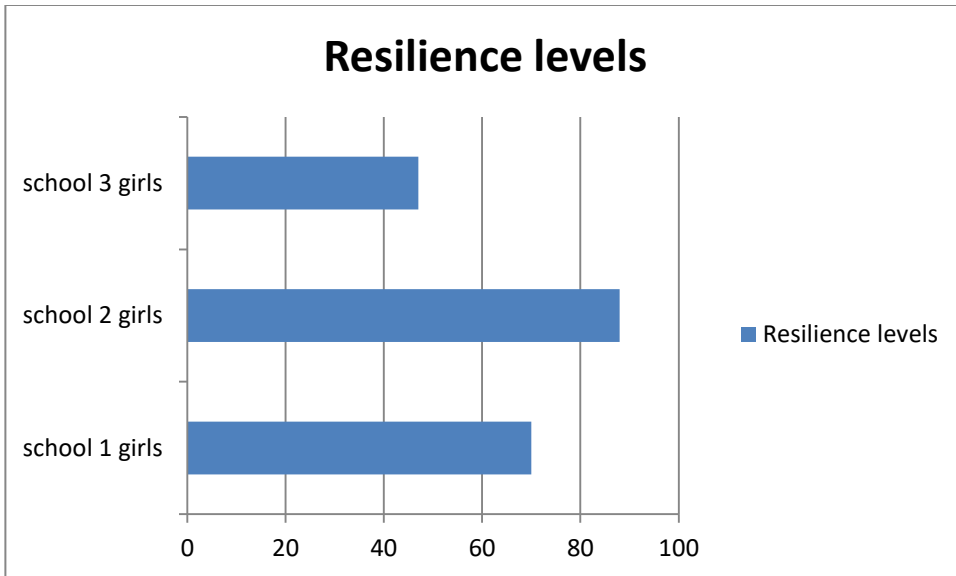
- Only include information pertinent to your key points. Too much extra data can be distracting.
- If you include very involved visuals, those that will require time and attention to wade through, use them as appendices, not in your summary.
- When formatting, whether decimal spaces or fonts and column widths, be consistent throughout.
- Only get as technical as your audience and your data demands. Beyond means and frequencies, are standard deviations, p-values, and t-values necessary to clearly make your key points?
- Sort your data before finalizing any display. An unsorted table, chart, or graph is not self-explanatory. With sorting comes enlightenment.
- As much as possible, group your information so there are less data points to wade through. Grouping leads to clarity.
- Graphs, charts, and tables should answer more questions than they pose.

Types of Graphs and Charts

BAR GRAPH

A bar graph is composed of discrete bars that represent different categories of data. The length or height of the bar is equal to the quantity within that category of data. Bar graphs are best used to compare values across categories.

- Bar graphs are used for direct comparison of data (e.g., student GPA's by class year).
- Bar graphs can also be used to show time series data when the number of time intervals is small.
- If all values are positive integers, the scale should generally use 0 as a baseline. In the event that values include both positive and negative integers (e.g., in graphing differences in means), 0 should be the midpoint of the scale.
- Scale ranges should be standardized and not vary between graphs, when possible.
- Always try to avoid using 3-D features in a bar graph. The complexity of 3-D graphs makes them ineffective in conveying results to most audiences and there is usually a greater amount of data distortion that occurs.
- Bar graphs may be vertical or horizontal. The only difference between horizontal and vertical bars is that horizontal bar charts are seldom used to portray time series.
- To facilitate comparison and analysis, it is desirable that columns be sorted in some systematic order. The most common and visually effective schema is according to size of value.

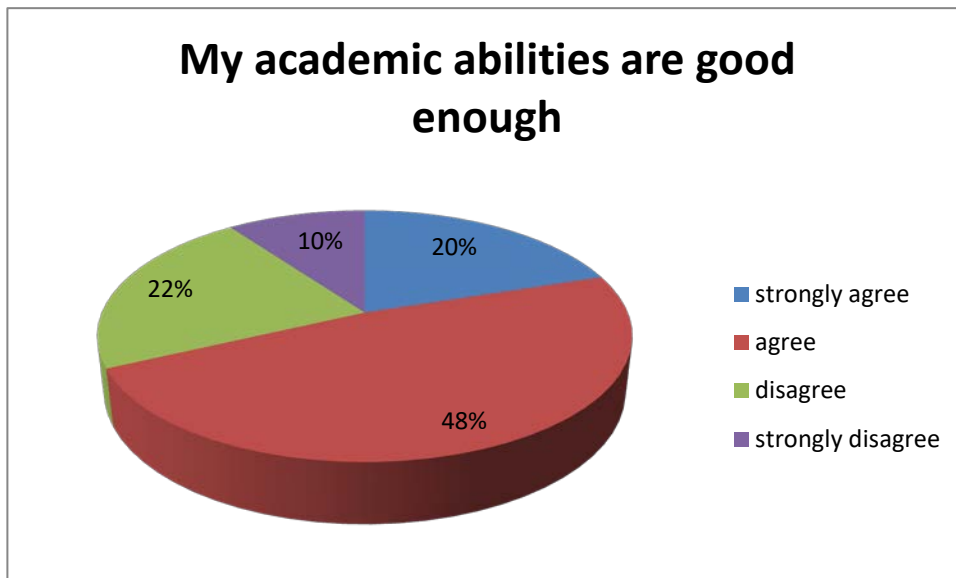


PIE CHART

A pie chart is a circular chart used to compare parts of the whole. It is divided into sectors that are equal in size to the quantity represented.

- Pie charts have limited utility. They can only be used to show parts of a whole (if all parts total 100%).
- Pie charts emphasize general findings, but do not make small differences apparent.
- Pie charts should only be used to represent categorical data with a relatively small number of values and should not consist of more than five or six slices.
- When presenting a pie chart, it is better not to use 3-D features, or break out the pieces, as this often makes it more difficult to compare the relative size of the slices.
- It is always necessary to include category labels or a legend that describes which slice corresponds with which category. If labels are brief enough, it is better to place category labels directly next to the pie slices to which they correspond.

- It is good practice to include value labels (indicating the percentage of the pie represented by a given slice).
- It is also good to pre-sort data so that, clockwise or counter-clockwise, the relative size of pie slices is most apparent



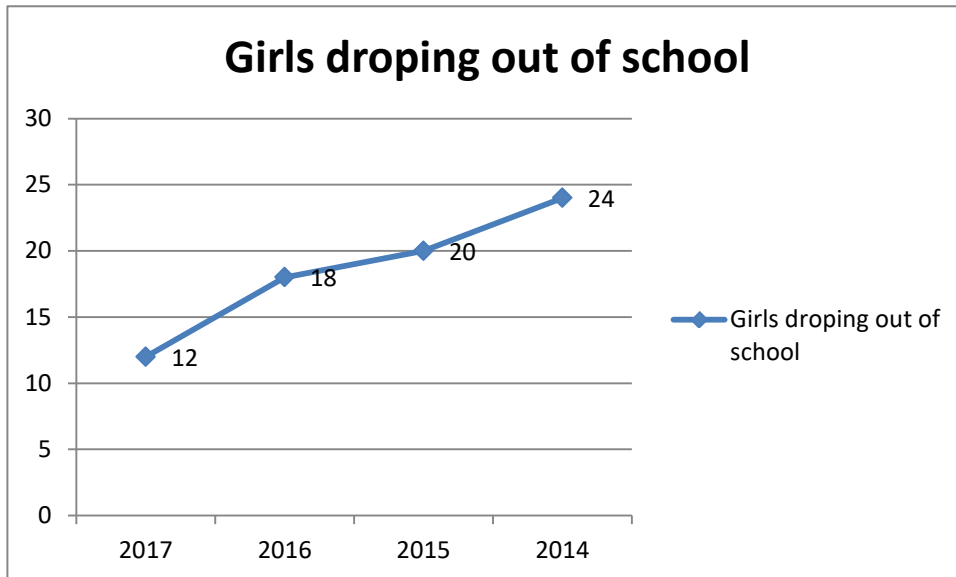
LINE GRAPH

A line graph displays the relationship between two types of information, such as number of school girls mentored by year. They are useful in illustrating trends over time.

- Compared with bar graphs, line graphs are more effective in presenting five or more data points, but less effective in providing emphasis on differences over relatively few periods of time.
- When plotting time series data in a line graph, it is convention that the x-axis (horizontal) contains the categories of time (e.g., days of the week, months, years – depending on the data), and the y-axis

(vertical) has frequencies of what is being measured (see graphs below).

- Graphs with more than four or five lines tend to become confusing unless the lines are well separated.



HISTOGRAM

A histogram has connected bars that display the frequency or proportion of cases that fall within defined intervals or columns. The bars on the histogram can be of varying width and typically display continuous data.

Use of Tables to Present Data

Tables are very effective when used for reference purposes.

- Title your table in a meaningful way.
- Avoid abbreviations if possible.
- It will be more meaningful to your audience if you convert actual

counts into percentages.

- If you have historical data, include columns for comparison.
- Your data should make sense: earliest years to later years, largest down to smallest amounts, highlight the most important points.

Summary

Benefits of using information from monitoring, evaluation and learning MEL are multiple. The value of MEL is determined by the degree to which the information collected is used by the intended decision makers and a wider range of audience. This manual was intended for programme officers and MEL officers to acquire ideas and skills to effectively apply for MEL in their daily work, for improvements, for accountability, decision making and learning. Specifically it was meant as a reference document as a follow-up to training for the Firelight partners in Malawi as they seek to improve their programmes.