

Aligning Data and Measures to Outputs and Outcomes of the Logic Model

Logic models are helpful tools for explaining educational programs or initiatives and their intended impacts. While plentiful guidance exists on [how to construct a logic model](#), less information exists on how to identify data and measures that align with the components in a logic model. This resource aims to help state-, district-, and school-level educators and staff use logic models to guide data collection efforts to determine progress toward measuring outputs and short-, medium-, and long-term outcomes.

Logic Models

A logic model is a graphic organizer describing what a program or intervention does to create both short-term and long-term change. It is an actionable plan with explicit steps that map to clearly identified outcomes and anticipated long-term impact. A well-developed logic model provides educators with a detailed and practical story of how a program will make change by explicitly sharing where they are going, how they will get there, and what they will show once they have arrived. Logic models can generate clarity and specificity around program components and intended outcomes for education partners and funders, assist when planning a program evaluation, and support a continuous cycle of improvement (Kekahio et al., 2014; Lawton et al., 2014; Shakman & Rodriguez, 2015; Stewart et al., 2021).

There are many ways to construct a logic model. Below is a logic model template example with annotation for each component.

Annotated Logic Model Template

Problem Statement (A description of the problem that the program is designed to address)					
If you have these resources in place	and you do these things,	you will generate this evidence of implementation,	achieve these changes in knowledge,	shape these behaviors,	and achieve these outcomes.
Resources/Inputs	Activities	Outputs	Short-Term Outcomes	Medium-Term Outcomes	Long-Term Outcomes
<ul style="list-style-type: none"> ➢ Human resources (personnel and volunteers) ➢ Monetary resources (funding streams) ➢ Facilities ➢ Expertise ➢ Curricula and materials ➢ Time 	<ul style="list-style-type: none"> ➢ Professional development sessions ➢ Family support programs ➢ Policy or procedure changes ➢ Use of a curriculum or teaching practice ➢ Mentoring or coaching ➢ Development of new materials 	<ul style="list-style-type: none"> ➢ Required deliverables (for example, funder reports) ➢ The number of activities ➢ Newly developed materials ➢ New policies or procedures ➢ Observations of the program in use ➢ The numbers of children, families, or staff involved or in attendance 	<ul style="list-style-type: none"> ➢ Most immediate and measurable results for participants that can be attributed to program activities ➢ Expected within a short period after implementation <p>Changes in knowledge or skills</p>	<ul style="list-style-type: none"> ➢ More distant, though anticipated, results of participation in program activities ➢ Require a longer period to fully take place <p>Changes in attitudes, behaviors, and practices</p>	<ul style="list-style-type: none"> ➢ Ultimate, desired outcomes of implementation of program activities ➢ Impacts of the program dependent on conditions beyond the scope of the program ➢ May manifest themselves after the program concludes <p>Systemic changes or changes in child and family outcomes</p>
Additional Considerations (Important details or ideas that do not fit into the other components in the logic model, i.e., external factors; assumptions)					



Adapted from: Stewart et al., 2021

Data and Measurement

After a logic model has been developed, aligning both **data** and **measures** to the logic model is necessary so program staff are able to monitor and measure the progress and impact of their programs.

You will likely need to collect and examine both **quantitative** and **qualitative** data to measure progress. As described below, quantitative data answers questions such as “how much” and qualitative data answers questions such as “why.” It can be helpful to gather and use both types of data to improve program implementation and assess outcomes.

Types of Data

Quantitative Data 	Qualitative Data 
Numeric	Non-Numeric
Include survey responses, assessment results	Include interview responses, focus group responses, and information from observations
Answer “how much/many” and “to what extent” questions	Answer “why” and “how” questions



Outputs typically only use quantitative data. Outputs capture data about what is done or created as evidence of carrying out a program. Outputs are often counts of activity data, such as attendance or number of people served, that are useful for tracking program implementation.

Outcomes often use both quantitative and qualitative data. Outcomes focus on the value or effectiveness of the program.

Data Sources and Collection Methods

There are various sources of quantitative and qualitative data that are frequently collected to assess outputs and outcomes in logic models. Quantitative data is commonly collected through surveys, often of students, teachers, or families. Quantitative data can also be drawn from extant data that districts and schools regularly collect, such as student demographic data or student assessments. Qualitative data can be collected through open-ended items on surveys, or through other ways of asking more in-depth questions such as interviews and focus groups. Observations of classrooms or programs can provide rich data about the quality of services. Documents and artifacts can be used as evidence of implementation for outputs but can also be reviewed for quality or to demonstrate a change in practice or ways of doing work.

Measurement begins in the planning phase of a program. The types of data and the sources you draw from should be driven by what you need to know about a program to measure its progress and success. When possible, use data that you already collect or that you could add to. For example, if you already administer a survey to families once a year, consider adding or modifying questions to collect data relevant to a key program you are trying to improve. When planning data collection, be realistic about what data you can collect and will use to inform programmatic improvement and decisions.

Quantitative Data Collection 	Qualitative Data Collection 
<ul style="list-style-type: none">➤ Structured surveys➤ Extant data (e.g., district database)➤ Student outcome assessments	<ul style="list-style-type: none">➤ Interviews➤ Observations➤ Focus Groups➤ Open-ended surveys➤ Documents➤ Artifacts

The quality of the processes you use to collect data will heavily influence the quality of the data you receive. Plan processes ahead, be thorough and consistent in your data collection methods, and be mindful of who you are collecting data from to ensure that everything you are requesting is clearly stated and understandable for everyone involved. Consult the following data collection tips to ensure that your efforts result in usable, high-quality data.

Considerations for Choosing Data Sources and Collection Method

1. What data do you need to measure your outputs and outcomes?
2. How will data be collected? Who will collect it? When?
3. What data sources do you have access to? How can you leverage existing data?
4. What time and resources can you devote to data collection?
5. What capacity is there to collect, analyze, and interpret the data?

Tips to Improve Data Collection

1. Collect data from multiple sources
2. Collect data from comparison groups not receiving the program when possible
3. Collect baseline data (i.e., data from before the program was implemented)
4. Only collect data you will use to inform decisions
5. Take steps throughout the data collection process to ensure data quality (i.e., completeness, accuracy, consistency, valid formatting)
6. Use culturally relevant evaluation approaches (i.e., make sure data collection is appropriate, clear, and accessible to all participants involved)
7. Involve diverse education partners in data collection plans

Measurement also includes setting targets for progress. Setting targets involves identifying measurable (often quantifiable) indicators related to each output or outcome included in the logic model that define if that element of the program has been successful. Targets should be specific to each output or outcome listed, and targets must be able to be seen, heard, read, or felt. For example, if an output within a program logic model was listed as “Increased amount of science equipment for student take-home activities,” an appropriate target would be “Student science kits available for check-out have been doubled.”

It is important to continue revisiting the outputs and outcomes you aim to achieve to reassess targets and progress during program implementation as well. Below is an example of how to align data and measurement to logic model components. This format can be used to identify targets and data sources for the logic model components of outputs, short-term outcomes, medium-term outcomes, and long-term outcomes for any program/intervention.

Targets and Data Sources for Logic Model Components

Logic Model Component	Targets	Data Sources
Outputs <ul style="list-style-type: none"> ➤ # of students served ➤ # of teacher professional learning sessions delivered ➤ program participation rate 	<ul style="list-style-type: none"> ➤ At least 50 students are served ➤ Two teacher professional learning sessions delivered a month ➤ 90% of students eligible for services participate in the program 	<ul style="list-style-type: none"> ➤ Attendance records ➤ Program ➤ Program records
Short-Term Outcomes <ul style="list-style-type: none"> ➤ Students increase their understanding of strategies to improve their math confidence ➤ Teachers increase their math instructional skills 	<ul style="list-style-type: none"> ➤ 90% of students participating in the program increase their understanding of strategies they can use to improve their math confidence ➤ 100% of participating teachers report an increase in their math instructional skills over the course of the school year 	<ul style="list-style-type: none"> ➤ Student survey (end of first semester, end of second semester) ➤ Teacher survey twice a year (beginning and end of school year)
Medium-Term Outcomes <ul style="list-style-type: none"> ➤ Students increase positive attitudes towards math ➤ Students improve their performance on math course assignments 	<ul style="list-style-type: none"> ➤ 80% of students participating in the program demonstrate an increase in positive attitudes towards math ➤ Student grades on math course assignments indicate an improvement from the beginning of the school year 	<ul style="list-style-type: none"> ➤ Student survey (end of first semester, end of second semester) ➤ Grades on math course assignments (beginning and end of the year)
Long-Term Outcomes <ul style="list-style-type: none"> ➤ Students' math achievement increases 	<ul style="list-style-type: none"> ➤ 80% of students participating in the program show an improvement in interim assessment scores by the third interim assessment ➤ More than half of the students participating in the program demonstrate grade-level math proficiency on the state assessment 	<ul style="list-style-type: none"> ➤ District interim assessment ➤ End of Year state assessment

Aligning data and measures to a program’s logic model components can help you track progress and measure impact. Ensuring alignment of data and measures with the outputs and outcomes of the logic model will support continuous improvement toward program goals.

Logic Model Resources

These REL program resources provide definitions, templates, examples, and strategies for developing a logic model.

[Logic models: A tool for designing and monitoring program evaluations](#)

This introduction to logic models defines the major components of education programs—resources, activities, outputs, and short-, mid-, and long-term outcomes—and uses an example to demonstrate the relationships among them.

[Logic models for program design, implementation, and evaluation: Workshop toolkit](#)

This toolkit is designed to help practitioners learn the overall purpose of a logic model, the different elements of a logic model, and the appropriate steps for developing and using a logic model for program evaluation. This toolkit includes a facilitator workbook, a participant workbook, and a slide deck.

[Program evaluation toolkit: Quick start guide](#) (Module 1: Logic Models)

This toolkit provides resources to support individuals responsible for evaluating and monitoring local, state, or federal programs. The toolkit comprises eight modules that cover critical steps in program evaluation, beginning at the planning stages and progressing to the presentation of findings. Model 1 is on logic models.

References

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