Logic Model Guide for ATE Projects

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This guide provides an overview of logic model components to assist National Science Foundation Advanced Technological Education (ATE) program grant seekers and grantees in developing logic models for their initiatives.

Why use a logic model?

Developing a logic model is an important first step for project design and evaluation planning. *A logic model is a visual depiction of what a project does and the changes it is expected to bring about.* A logic model can be presented as a flowchart, table, or diagram, or in another format that succinctly communicates the overall vision for the project. It can then be used as a reference to identify evaluation questions and the data needed to answer those questions.

What are the components of a logic model?

There is no one right way to make a logic model. However, ***at a minimum, all logic models should clearly communicate the project's planned activities, outcomes, and impacts.*** From there, choose a structure and additional components that make sense for your project and meet the audience's information needs. Beyond the basics, a logic model may also include information on inputs, outputs, context, assumptions, and other factors that influence the project.

Core components

Include these essential components to communicate what your project does and the change it intends to bring about.

Activities.

The key things your project will do to bring about intended change (e.g., actions, processes, and events).

***Answers the question**: What are the main things the project will do to bring about change?*

ATE examples:

- Develop curriculum
- Conduct workshops
- Provide field experiences
- Establish articulation agreements
- Hold summer transition program for high school students

Short-Term Outcomes.

Measurable changes in the intended participants that result from activities or outputs (e.g., knowledge, skills, attitudes, behavior, or practices).

Answers the questions: *What will occur as a result of the activities and outputs? What will the intended participants know or be able to do because of the project?*

ATE examples:

- Faculty learn to use virtual reality technology
- Students' interest in technical careers increases
- High school students' awareness of STEM pathways increases
- Diversity of students enrolled in STEM program increases

Mid-Term Outcomes.

Measurable changes in the intended participants that result from short-term outcomes (e.g., knowledge, skills, attitudes, behavior, or practices).

Answers the question: *What results should follow from the initial outcomes?*

ATE examples:

- Students gain technical and employability skills
- Students persist in their programs
- Faculty improve instruction
- Diversity of STEM program graduates increases
- More technicians enter the workforce

Long-Term Impacts.

Broader changes that result from mid-term outcomes and that address the conditions that make the project necessary. Impacts may occur at an individual, organizational, community, or systems level.

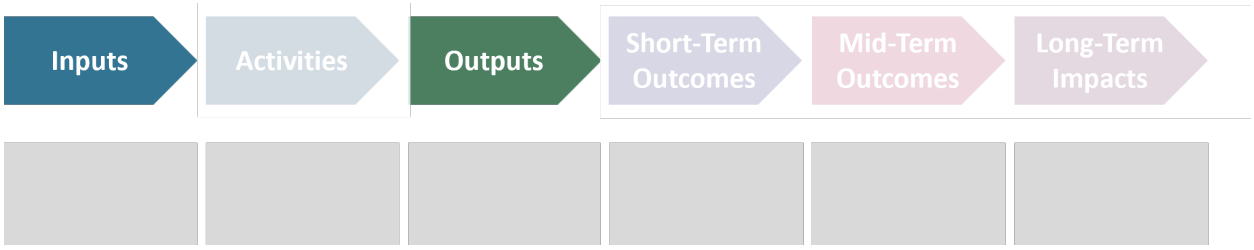
Answers the question: *What is the intended larger impact of the project?*

ATE examples:

- Diversity in the technical workforce increases
- The workforce becomes more highly skilled and adaptable
- STEM pathways are sustained at two- and four-year colleges
- Local industries' needs for technicians are met

Components to describe tangible resources used and created

In addition to the core logic model components, you may want to consider including inputs or outputs in your logic model.



Inputs.

Resources that are needed to implement project activities (e.g., equipment, space, services, staffing, funding).

Answers the questions: *What resources are essential for the project's success? What resources would be needed to replicate the project?*

ATE examples:

- NSF funding
- Faculty
- Advisory panel
- Industry partners
- In-kind contributions
- Existing college or university infrastructure or technology

Outputs.

Activities' immediate, tangible results that can be counted or observed directly. Usually quantifies services and deliverables provided and/or describes their reach.

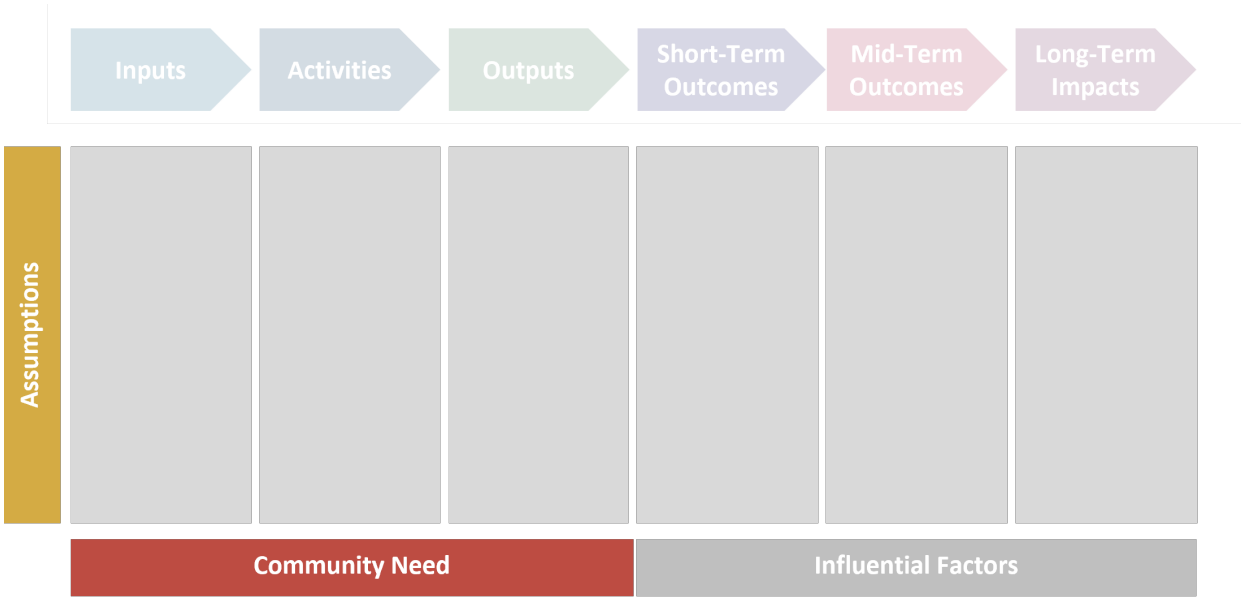
Answers the questions: *What products will be created? How many of each product will be created?*

ATE examples:

- Number of curriculum materials
- Number of revised institutional policies to promote equity
- Number of new certificate programs
- Number of students participated
- Number of articulation and dual-enrollment agreements executed

Components to acknowledge context and systems

You may find it useful to include additional components to convey why your project is needed, why you believe it will work, and which factors may affect long-term outcomes and impacts.



Community Need.

Specify the problem or opportunity that led your organization to design your project.

Answers the question: *What problem or opportunity does your project address?*

ATE examples:

- Not enough skilled technicians
- New technology requires upskilling
- Region lacks STEM pathways between two- and four-year institutions
- Need pipeline for highly skilled jobs for a sub-population that is currently underemployed

Influential Factors.

Factors *other than the program's actions* that may positively or negatively influence the project's outcomes or impacts (e.g., policy environment, changes in the economy, technology advancements, societal events).

Answers the questions: *What are the potential barriers and/or facilitators that might impact the desired change? What policies or other factors might influence your project*

ATE examples:

- Implemented at a Hispanic Serving Institution
- Existing strong articulation agreements
- Engaged industry partners
- Recently renovated lab facilities
- Other professional development opportunities available for faculty

Assumptions.

The main principles, beliefs, and expectations that make you think the program will be successful in its context. They are the underlying rationale that connect the activities to the expected outcomes. Assumptions are often the reason why projects don't perform up to expectations.

Answers the questions: *Why will your approach be effective in your community? Why might your project not live up to your expectations? What has to go right in order for your project to succeed?*

ATE examples:

- The college will maintain current student support services
- Local industry will continue to need technicians
- Faculty will receive release time from their departments to participate in training
- Local public transit will increase bus routes to campus as planned

What are the potential limitations of a logic model?

- **Logic models are typically linear.** Logic models assume a linear cause-and-effect relationship between components (i.e., one thing clearly causes another). In reality, the relationships may be more complex and nonlinear.
- **They oversimplify causal links.** Logic models may overstate the causal links between the components and deemphasize the importance of contextual factors necessary for bringing about change. One way to help address this is to acknowledge contextual and systemic factors (such as community needs, assumptions, and external factors) within the logic model.
- **They have the potential to turn into static documents.** Logic models are often developed during project planning and never revisited. They need to be reviewed and updated continually to reflect evolving projects.
- **Logic models don't capture potential unintended outcomes.** Logic models often only include *intended* consequences of a project. Evaluators using logic models for evaluation planning also need to be aware of *unintended* consequences of projects.

How does one assess the quality of a logic model?

To analyze your logic model, start with these questions:

- ☐ ***Is there a logical connection between the components of the model?***
  Logic models should be able to be read from left to right, using a chain of reasoning that uses "if ... then" statements (i.e., "If [activity], then [outcome]").
- ☐ ***Do the long-term impacts address the identified community needs?***
  If a program is designed to respond to a community need, then the long-term impacts should address that need.
- ☐ ***Are the outcomes realistic?***
  Outcomes should be achievable given the resources available to the project, including time, funding, and personnel/expertise.
- ☐ ***Is the meaning of the logic model clear?***
  Ideally, a logic model is self-explanatory, in that readers (even, if possible, those unfamiliar with the project) can understand it without the help of additional written or spoken information.
- ☐ ***Is all information in the logic model pertinent to how the project will bring about change?***
  A strong logic model is succinct. Exclude extraneous information about project administration or activities or conditions that do not bear directly on how the project will bring about change.
- ☐ ***Do individuals close to the project (i.e., staff, participants, funders, administrators, community members) find the logic model helpful for understanding the project?***
  A logic model should reflect the understanding of multiple groups of participants close to the project.

Interested in more logic model resources?

EvaluATE's fillable logic model template: Use this template to jump-start your logic model development. bit.ly/ate-lm-temp

The W.K. Kellogg Foundation's logic model development guide: Look here for instructions and examples geared toward building logic models for different purposes. bit.ly/kellogglm

Logic model resources from the University of Wisconsin–Madison's Extension office: This wide-ranging collection includes resources on how to build logic models and good examples of logic models that describe program assumptions. bit.ly/uwm-lm

Examples of ATE-specific logic models: Look at the ATE logic models in the award-winning evaluation reports created by Magnolia Consulting, The Rucks Group, and The Allison Group and MUME Collective. bit.ly/ate-examples

Example of a nonlinear logic model: Learn about the development of the Oregon Paint Stewardship Pilot Program's nonlinear logic model in Matt Keene's AEA365 blog post.

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How can we help?

ATE grantees and prospective grantees can contact EvaluATE anytime at info@evalu-ate.org.

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