



Logic Models:

The Swiss Army Knife of
Project Planning and Evaluation

Kelly Robertson, PhD & Lyssa Wilson

HI-TEC Conference 2016

Introduction



Evaluation Resource Center for
Advanced Technological Education



This material is based upon work supported by the National Science Foundation under grant number 1204683. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the presenters and do not necessarily reflect the views of NSF.

Folder Contents



Evaluate
Evaluation Resource Center for
Advanced Technological Education

Evaluation Planning Checklist for NSF-ATE Proposals

For HITEC | August 2016

This checklist is intended to be used as a guide for developing evaluation plans for proposals to the National Science Foundation Advanced Technological Education (ATE) program. It is organized around the components of an NSF proposal from the [NSF proposal guide](#) with an emphasis on the evaluation aspects. This document is not intended to serve as a comprehensive checklist for preparing an NSF proposal, but for providing guidance on the evaluation aspects. All proposals should carefully review the [NSF proposal guide](#) for additional guidance related to developing ATE proposal evaluation plans. See [NSF proposal guide](#) and [NSF proposal guide](#) for additional information on the ATE program.

Proposal Component	What you need to do	What you need to know
PROJECT SUMMARY (7 pages)	<ul style="list-style-type: none"> Prepare a 1-page project summary that specifically addresses the NSF traditional Merit and Broader Impacts criteria. 	<ul style="list-style-type: none"> In addition to the NSF-wide traditional Merit and Broader Impacts criteria, the ATE program has additional criteria, some of which are about evaluation. Those that are specified in the program solicitation. You are unlikely to have enough space to address all criteria in the project summary, so focus on the ones most relevant to your proposal.

PROJECT IS (15 pages)

Evaluate
Logic Model Template for ATE Projects & Centers
by Lori A. Wingate | March 2016

This research is supported in part by the National Science Foundation grant number 1208814. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

A logic model is a visual depiction of what a project does and what changes it is expected to bring about. Developing a logic model is an important first step for project design and evaluation planning. This document is intended to provide general guidance to ATE program proposers and program developers for developing their own project logic model. All parts of this document are editable. Populate the boxes in each column (adding and deleting boxes as necessary) with text or images that describe the logic model process. To add text to a box, select the box and paste the text directly into the text control (ID#, instructions, user inputs, etc.) from the document or user and paste the logic model elements into a new document for your use. To learn more about logic models, see the document by Deborah Stewart on logic model development: [http://www.evaluate-ate.org/ate-logic-model-overview](#)

Inputs	Activities	Outputs	Short-Term Outcomes	Mid-Term Outcomes	Long-Term Outcomes

Below is an example of the type of information that might appear under each header of the logic model. When developing a project logic model, be specific. In particular, include specific components of the model, or criteria, or outcomes, or program specific short-term outcomes might be placed in "user input" or "user output" boxes, and include short-term "high-impact" outcomes.

NSF priorities

- Education
- Faculty
- Industry process
- Research contributions
- Graduate work/labs
- Provide certifications
- Research
- Education
- Workforce agreements

Establish

- Curriculum materials
- Faculty process
- Academic contributions
- Graduate work/labs
- Provide certifications
- Research
- Education
- Workforce agreements

Equip

- Faculty train to use
- Student services
- Research
- Education
- Workforce agreements

Students receive

- Hands-on
- Research
- Education
- Workforce agreements

Increased

- Research
- Education
- Workforce agreements

Research

- Faculty process
- Academic contributions
- Graduate work/labs
- Provide certifications
- Research
- Education
- Workforce agreements

Faculty process

- Academic contributions
- Graduate work/labs
- Provide certifications
- Research
- Education
- Workforce agreements

Academic contributions

- Graduate work/labs
- Provide certifications
- Research
- Education
- Workforce agreements

Graduate work/labs

- Provide certifications
- Research
- Education
- Workforce agreements

Provide certifications

- Research
- Education
- Workforce agreements

Research

- Education
- Workforce agreements

Education

- Workforce agreements

Workforce agreements

[www.evaluate-ate.org | \(202\) 387-5350 | Western Michigan University](http://www.evaluate-ate.org | (202) 387-5350 | Western Michigan University)

Bio-Inspired Solutions to Human Challenges
Project Abstract

In spite of growing demand for technicians among local manufacturers, Buteo Community College is experiencing under-enrollment in engineering technology and pre-engineering programs.

Sixty percent of the college's students are female, but comprise just 15 percent of engineering students. Therefore, the course is especially aimed at attracting female students and motivating them to pursue degrees in these areas.

The main activities include (a) completion of the course curriculum;

Evaluate
LOGIC MODELS: THE SWISS ARMY KNIFE OF PROJECT PLANNING AND EVALUATION
Kelly Robertson and Lyssa Wilson | HITEC Conference | August 2016

Thank you for participating in today's session. Please answer the questions below. Unless you write your name on this form, your response will be anonymous.

- What is your relationship to the National Science Foundation's Advanced Technological Education program?
 - Not involved with the ATE program
 - Principal investigator for an ATE project/center
 - Other ATE program administrator/manager
 - External stakeholder
 - Internal stakeholder
 - Other (please specify)
- Select the type of your organization if it is:
 - the academic
 - the employer
 - I self-study with
 - I would report
- For each workshop:
 - Fundamentals of logic models
 - How to create a logic model
 - How a logic model could be used in project planning
 - How a logic model could be used in evaluation
- If you plan to use the workshop:
 - What you expect of the workshop
 - What aspect of the workshop you expect to benefit from

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Kelly Robertson and Lyssa Wilson | HITEC | Aug 2016

This is the handout from Evaluate's session at the 2016 HITEC Conference, Logic Models: The Swiss Army Knife of Project Planning & Evaluation. Find more resources on our website: www.evaluate-ate.org

Web Links

- Presentation Slides & Resources | <http://bit.ly/evaluate-HITEC2016>
- ATE Logic Model Template | <http://bit.ly/ate-logic>
- Evaluation Planning Checklist for NSF-ATE Proposals | <http://bit.ly/evaluation-checklist>
- Evaluation Question Checklist | www.evaluate-ate.org/evaluation-checklist

Logic Model Components

What you do

Change you bring about

Activities	Outputs	Short/Mid-Term Outcomes	Long-Term Outcomes
<ul style="list-style-type: none"> • What your project does • Usually expressed as nouns • Detail what & how much resources are used 	<ul style="list-style-type: none"> • Direct, immediate & tangible product of activities • Measurable & observable/tangible • Often expressed as nouns or numerical terms 	<ul style="list-style-type: none"> • Change in target as a result of outputs • Change in awareness, knowledge, skills, attitudes, behaviors • Define length of time for short & mid-term 	<ul style="list-style-type: none"> • Impact on systems, institutions, communities, lives, impact that aligns with larger STEM goals • Impact on field & industry, but entirely controlled by project • Likely not feasible to measure

Uses of Logic Models

The following are tips on two of the many ways logic models can be used to benefit your project.

Project Proposals

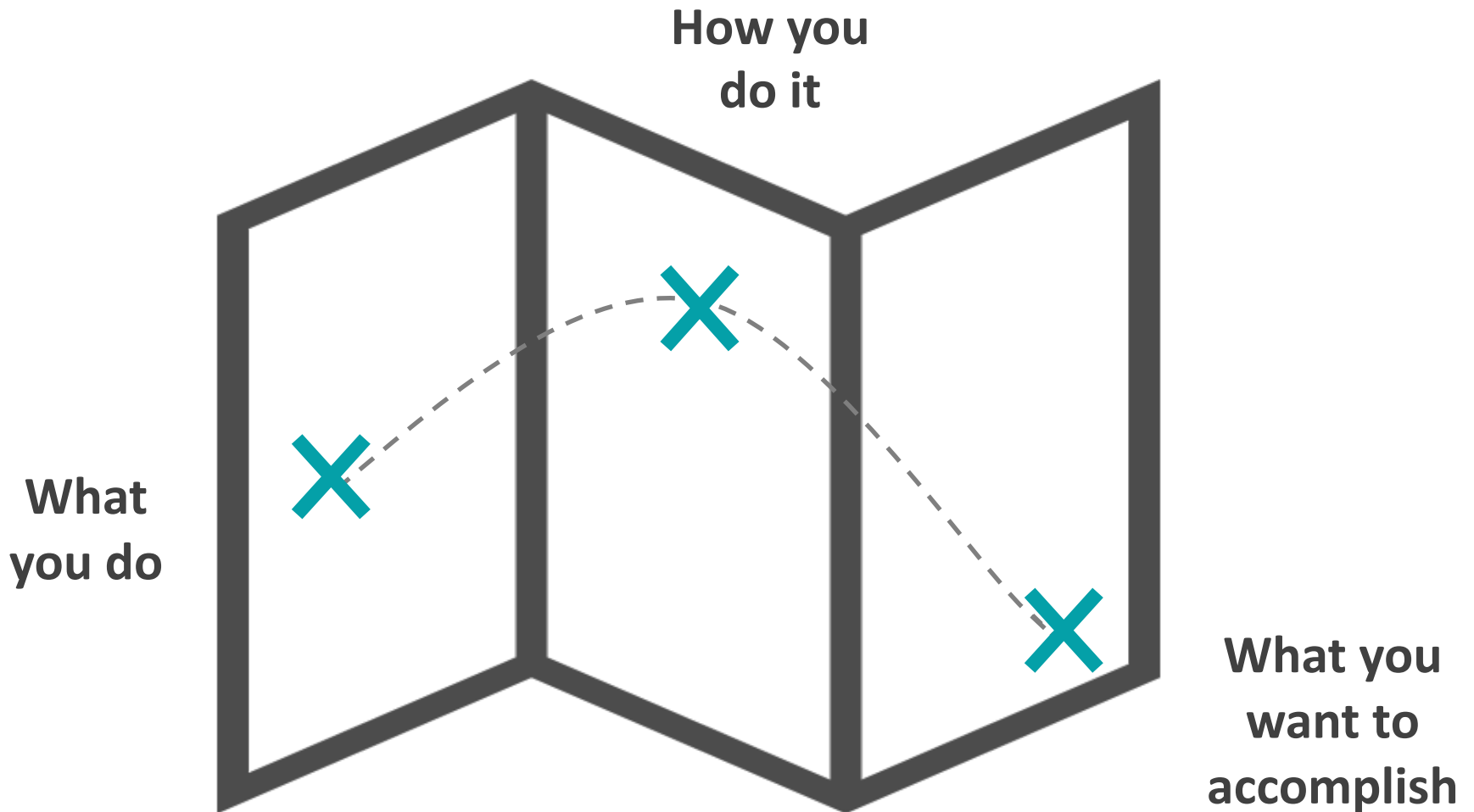
- Use activities from the logic model as headings in the project description section
- Incorporate outcomes into Goals & Objectives & Broader Impact sections

Evaluation Planning

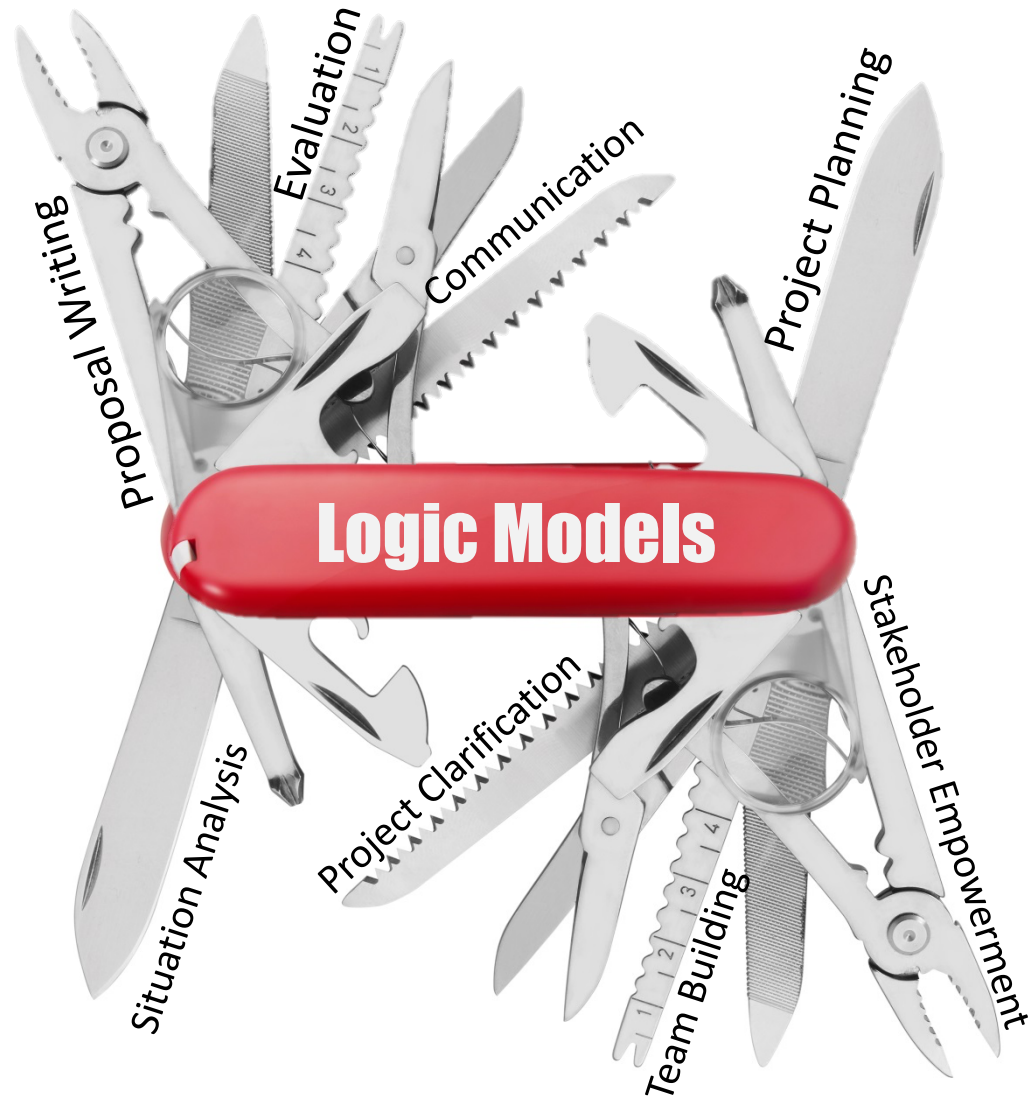
- Align evaluation questions with logic model components
- Collaborate with stakeholders to determine questions
- Consider including both process & outcomes focused questions

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Logic Models: *Overview*



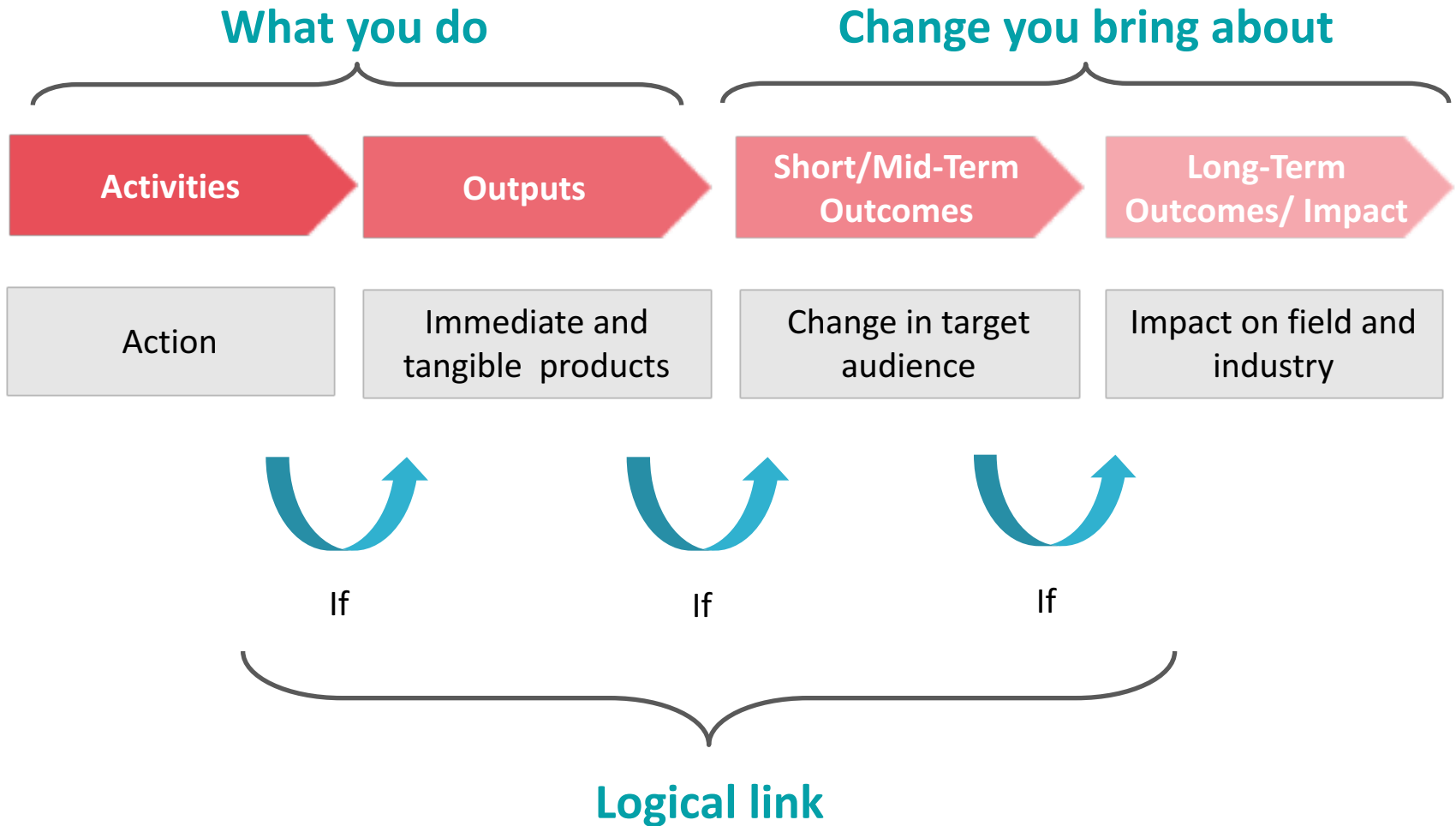
Uses of a Logic Model



Objectives

- 1 What is a logic model?
- 2 How do you build a logic model?
- 3 How can you use a logic model to organize a proposal?
- 4 How can a logic model be used as foundation for an evaluation plan?

Logic Model



Logic Model: *Parts*



What does it mean?



Answer what question?



Tips & tricks for application

Logic Model: *Parts*

Activities



Action (or process or event) done to bring about intended outputs and outcomes



What did we do? What do we plan to do?



Should describe what and how much to get desired amount of results (i.e., dose)

Logic Model: *Parts*

Outputs



Direct, immediate, and tangible product(s) of activities delivered by project



What was produced by the activities?



Often expressed as count or in numerical terms

Logic Model: *Parts*

Short- and Mid-term Outcomes



Change in target audience that results from the activities and outputs (e.g., knowledge, skills, abilities, behavior, functioning)



What will target audience know or be able to do because of the project?



Should define length of time considered short- and mid-term. Something you are certain will change because of your project.

Logic Model: *Parts*

Long-Term Outcomes/Impacts



Change that impacts systems, institutions, and communities resulting from the project outcomes (i.e., impact that aligns with larger STEM goals)



What is the larger impact of the project?

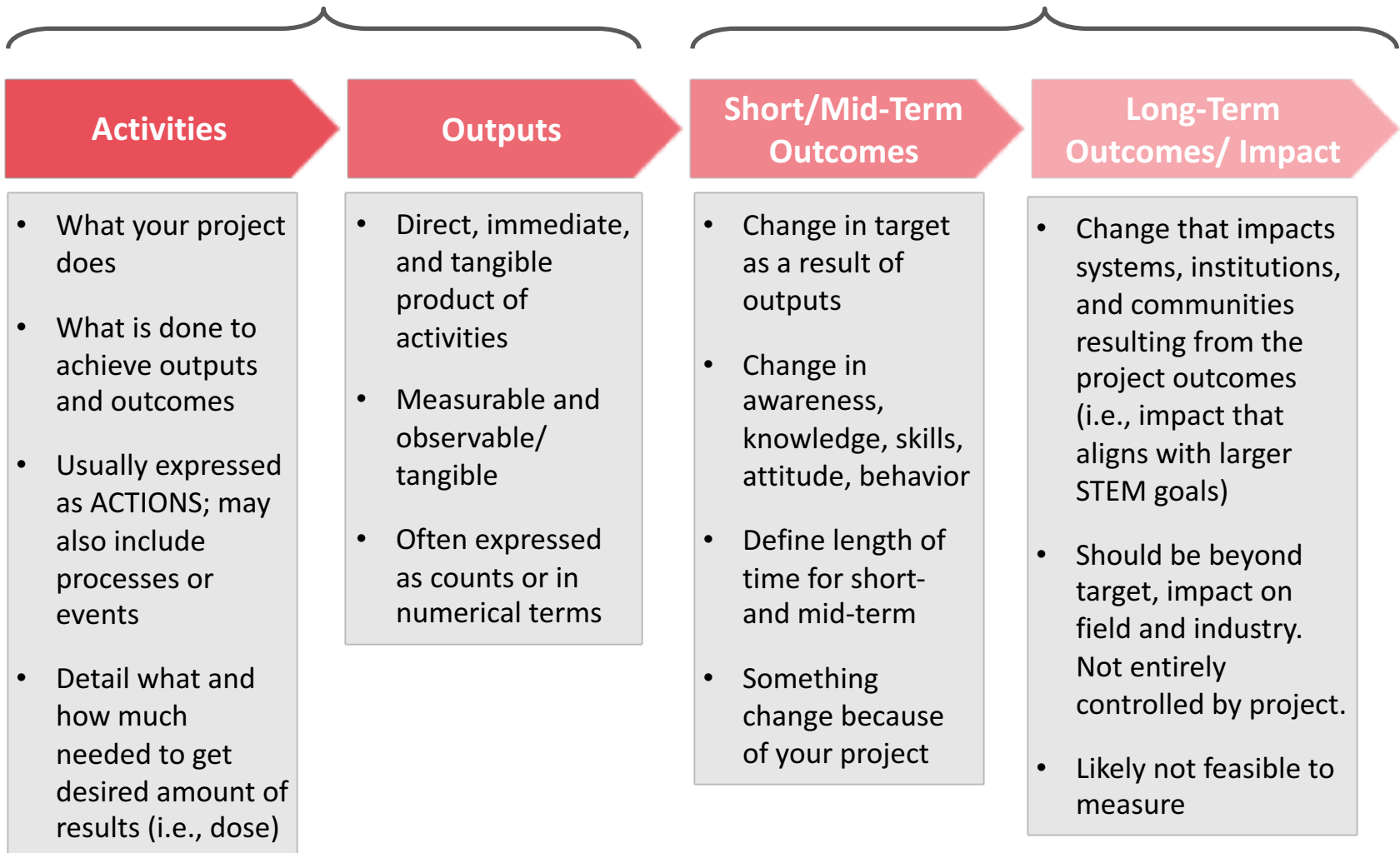


Should be beyond target audience, impact on field and industry. Not entirely controlled by project.

Logic Model: *Summary of Parts*

What you do

Change you bring about



Logic Model

Strengths

- ✓ Quick and easy-to-read
- ✓ Communicate complex information
- ✓ Demonstrate you have a well planned project
- ✓ Identify project gaps



Challenges

- ✓ Static document
- ✓ Life and projects are not linear
- ✓ Simplistic
- ✓ Not always easy to identify right outcomes



Logic Model: *In Action*



SCI 152: Bio-Inspired Solutions to Human Challenges

Biology | Design | Economics | Engineering | Material Science



Engineering technicians:
*High demand,
low supply*



Buteo College

60% female

Engineering
Technology &
Preengineering

15% female

SCI 152: Bio-Inspired Solutions to Human Challenges

Biology | Design | Economics | Engineering | Material Science



**Complete
course
curriculum**



**Develop
promotional
video**



**Raise
awareness
among
college
personnel**



**Outreach to
female
students
with
undeclared
majors**

Bio-Inspired Solutions to Human Challenges

Project Abstract



In spite of growing demand for technicians among local manufacturers, Buteo Community College is experiencing under-enrollment in engineering technology and pre-engineering programs.

To address this problem, the college is developing a general education science course to attract students with undeclared majors to these and other STEM programs. This interdisciplinary course is designed to educate and excite students about bio-inspired engineering and design.

Sixty percent of the college's students are female, but comprise just 15 percent of engineering students. Therefore, the course is especially aimed at attracting female students and motivating them to pursue degrees in these areas.

The main activities include (a) completion of the course curriculum; (b) creation of a short video about bio-inspired engineering; (c) presentations to admissions counselors, advisors, and faculty about the focus and purpose of the course; (d) outreach to female students with undeclared majors.

Project Logic Model



ACTIVITIES

what a project does

Bio-Inspired Solutions to Human Challenges

Project Abstract



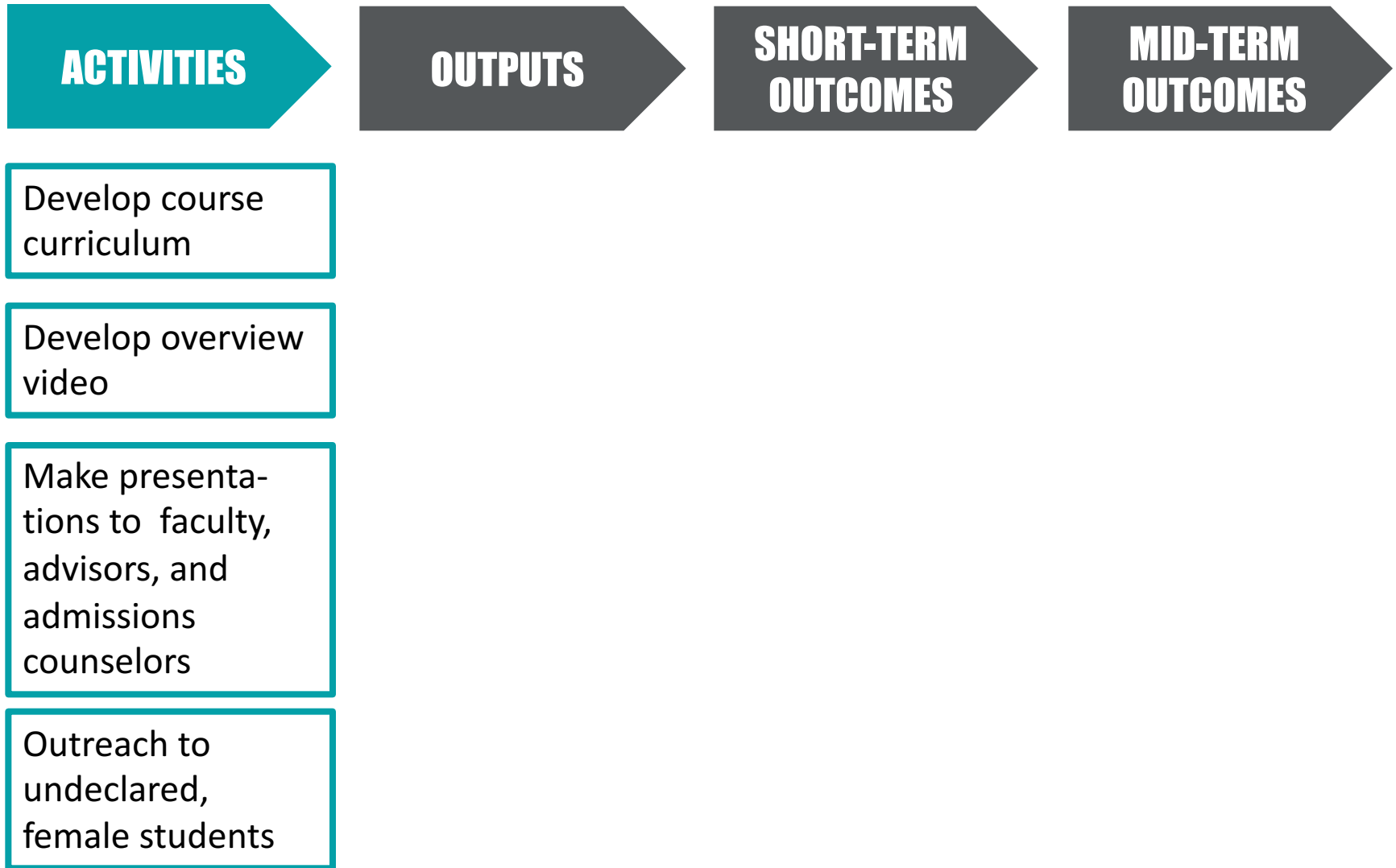
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Project Logic Model



Project Logic Model



OUTPUTS

direct, immediate, and tangible products of activities

Bio-Inspired Solutions to Human Challenges

Project Abstract

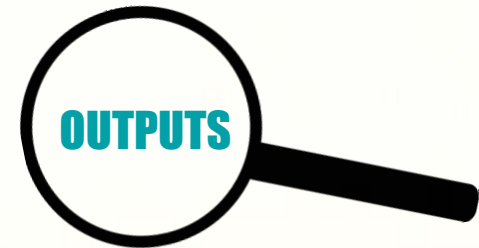


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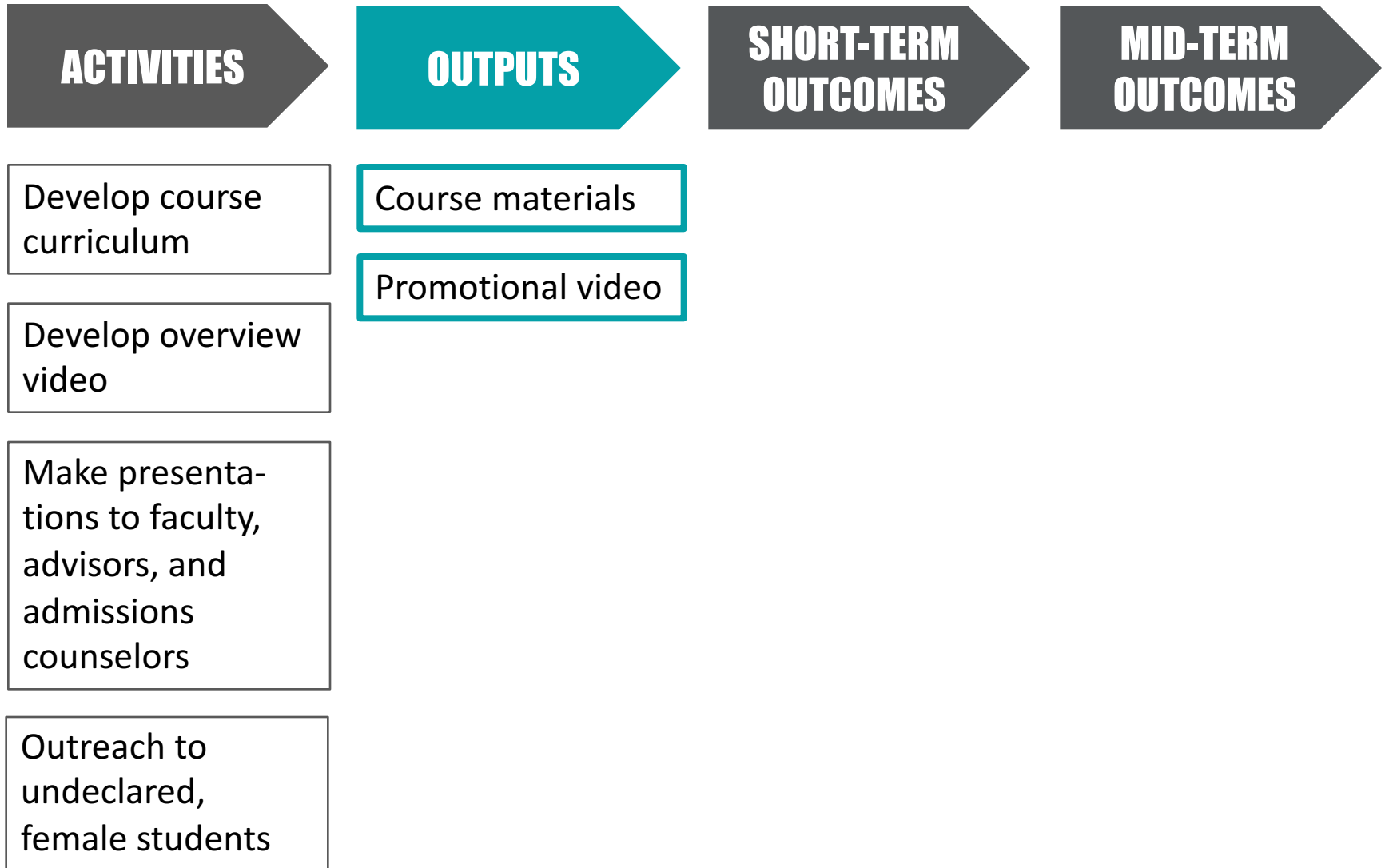
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Project Logic Model



Project Logic Model



OUTCOMES

changes brought about through project activities and outputs

in knowledge, skills, attitudes, behaviors, policies, practices, broader conditions

Bio-Inspired Solutions to Human Challenges

Project Abstract



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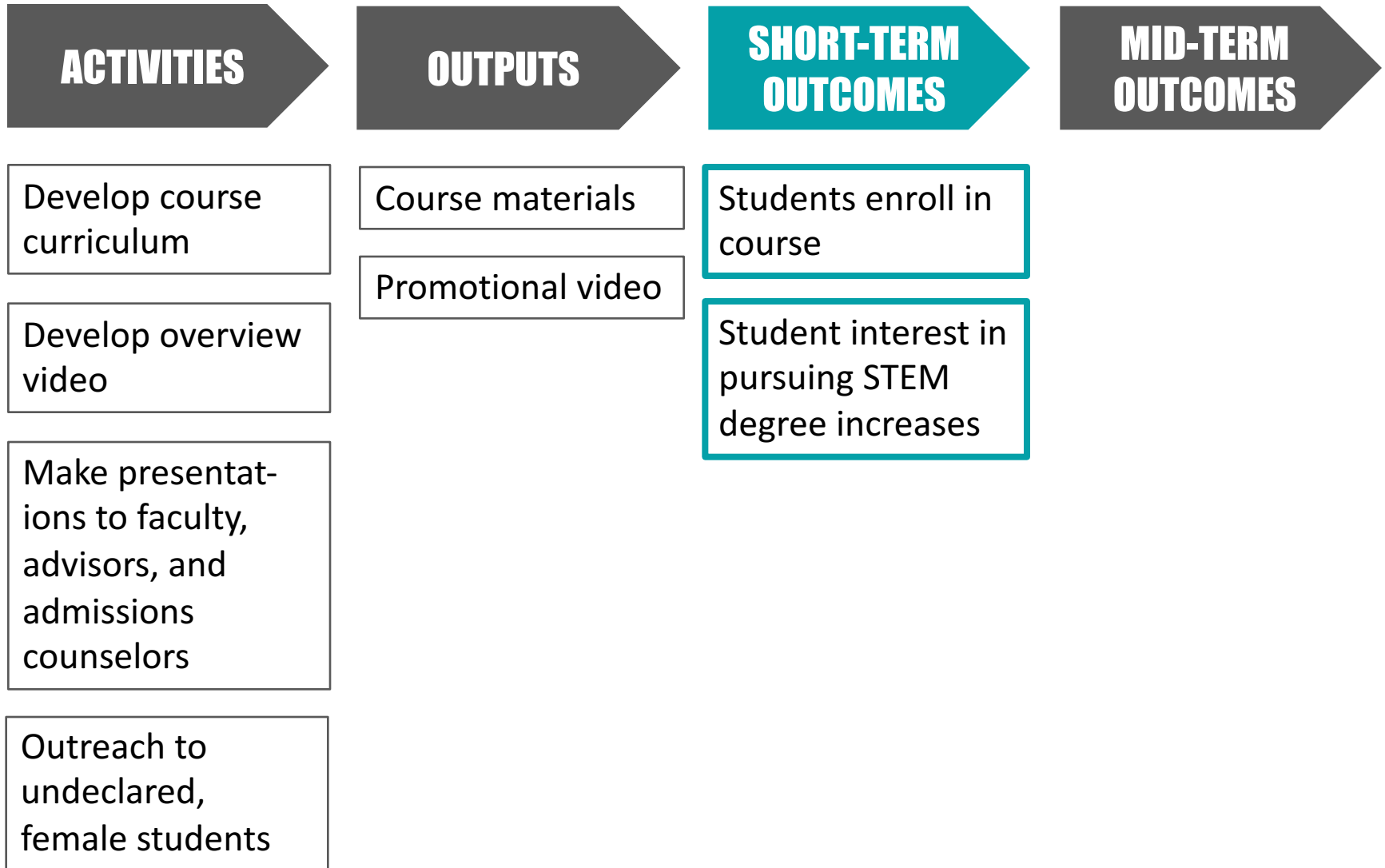
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Project Logic Model



Bio-Inspired Solutions to Human Challenges

Project Abstract



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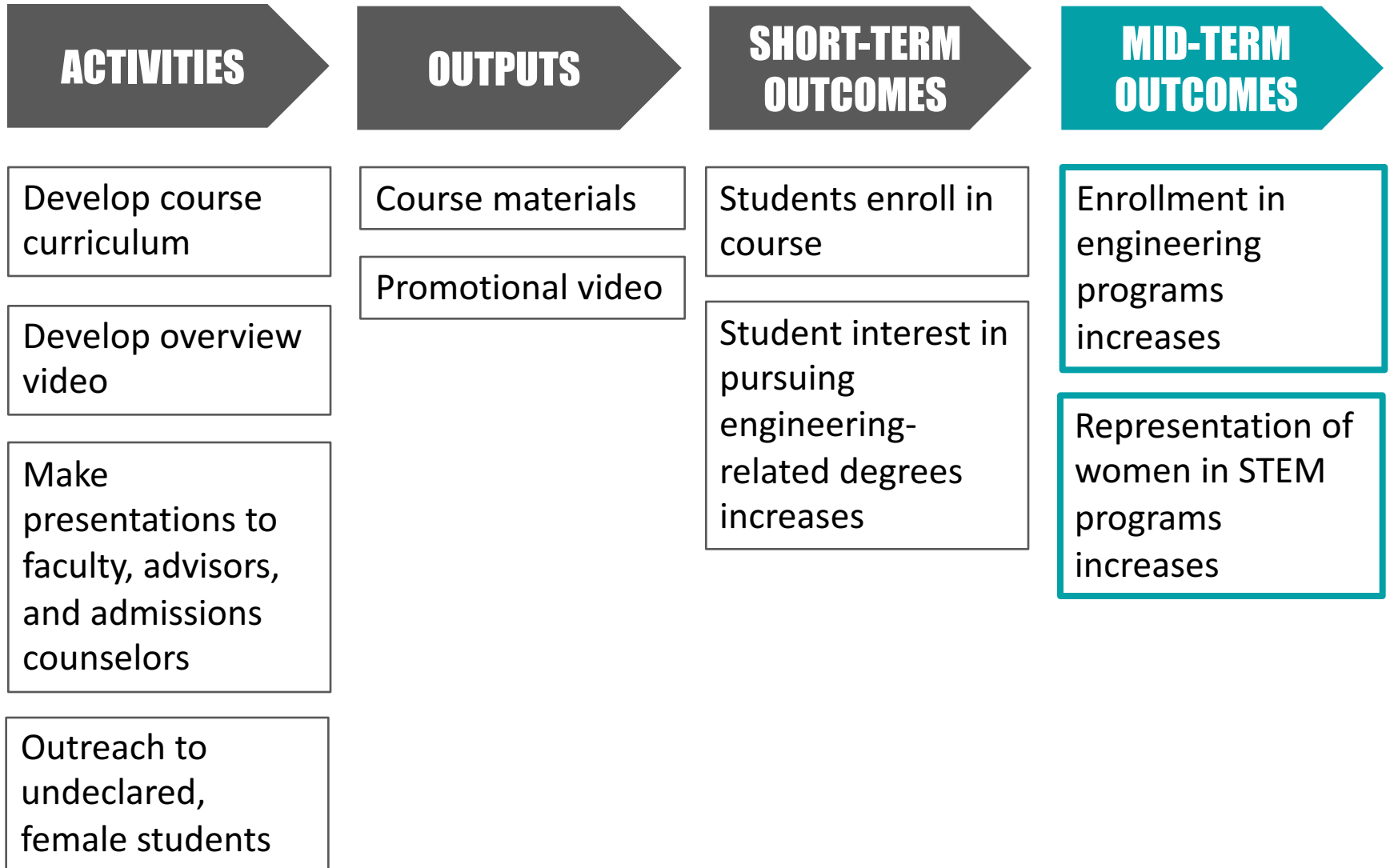
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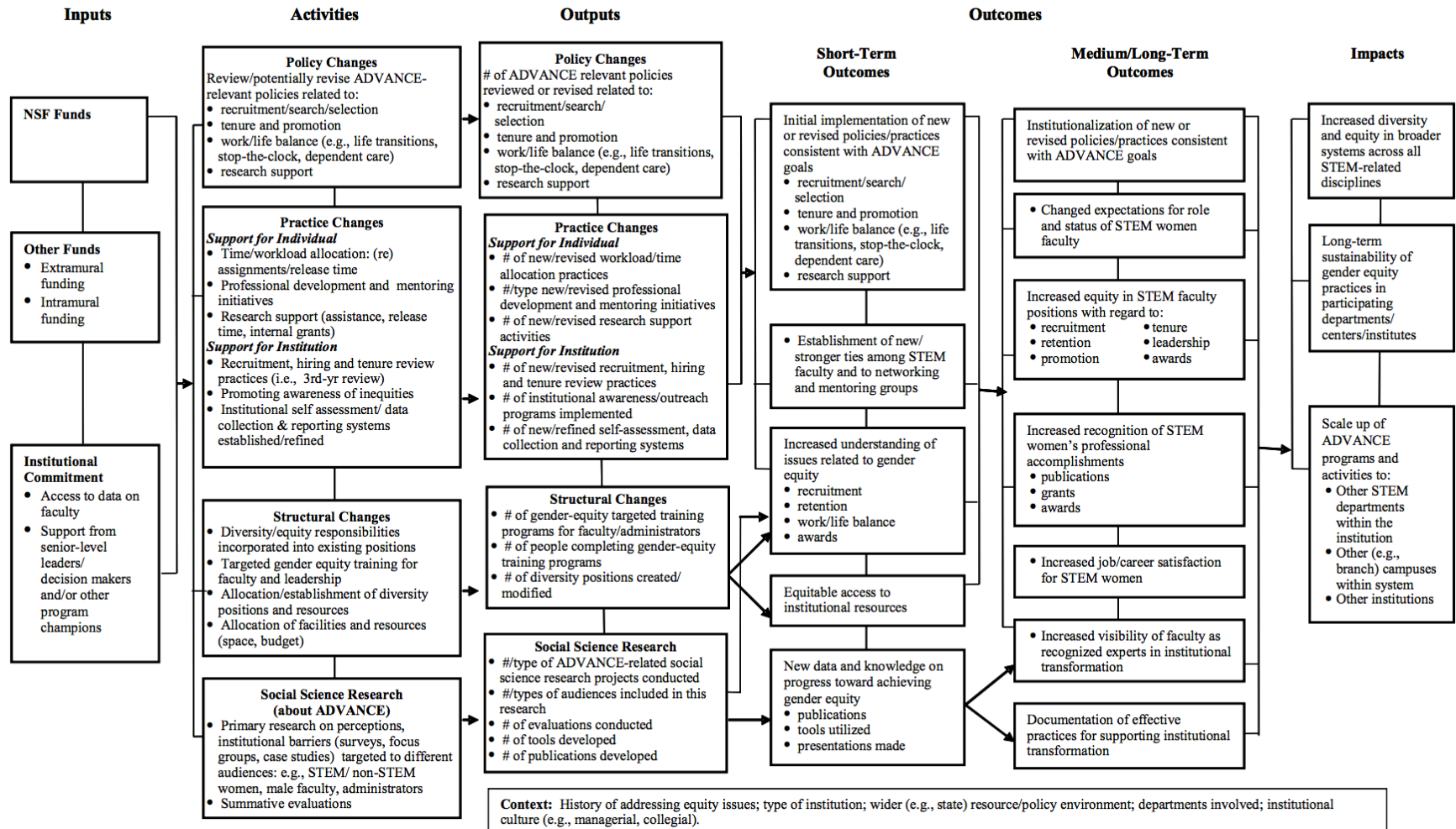


Project Logic Model

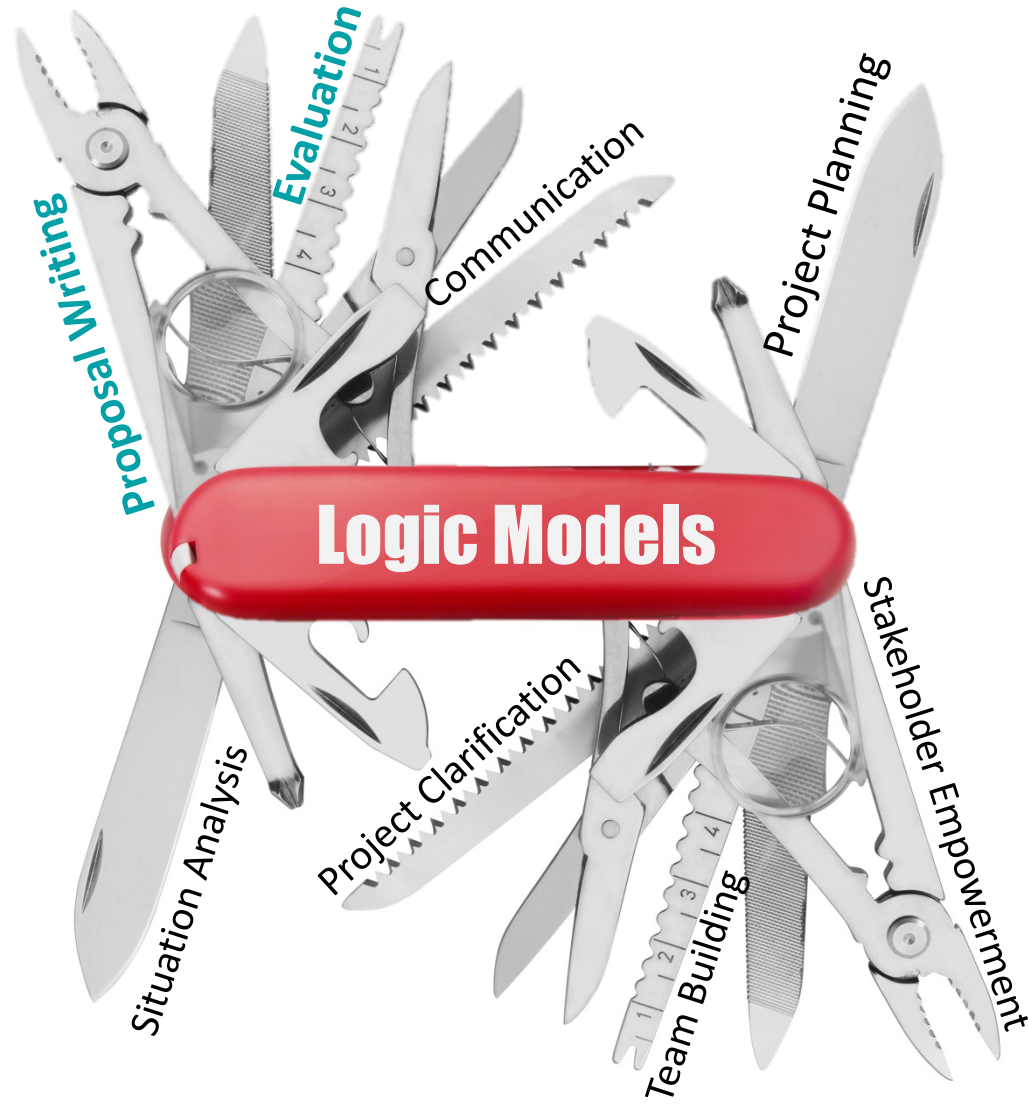


Logic Model: *In Action*

Exhibit 7. Logic model for ADVANCE IT Program



Logic Models: *How To Use*



Logic Models: *How To Use*

Project Proposal Development



Use in Project Proposals

NSF Proposal Components

Use **Logic Model** as Structure

- Cover Sheet
- Project Summary
- Project Description**
- References Cited
- Budget and Budget Justification
- Current and Pending Support
- Facilities, Equipment and Other Resources
- Supplementary Documents

Use in Project Proposals

ACTIVITIES

Develop course curriculum

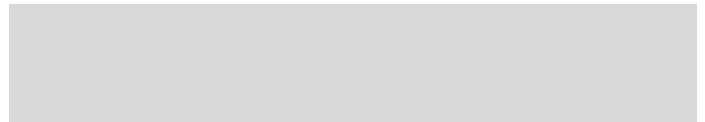
Develop overview video

Make presentations to faculty, advisors, and admissions counselors

Outreach to undeclared, female students

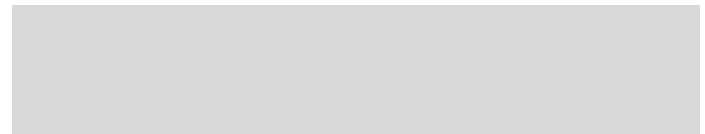
Project Description

Bio-Inspired Solutions to Human Challenges

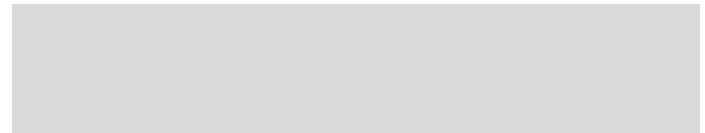


Activities

Curriculum Development



Video Development



Use in Project Proposals

ACTIVITIES

Develop course curriculum

Develop overview video

Make presentations to faculty, advisors, and admissions counselors

Outreach to undeclared, female students

OUTPUTS

Course materials

Promotional video

Project Description

Bio-Inspired Solutions to Human Challenges

Activities

Curriculum Development

Video Development

Use in Project Proposals

SHORT-TERM OUTCOMES

Students enroll in course

Student interest in pursuing engineering-related degrees increases

MID-TERM OUTCOMES

Enrollment in engineering programs increases

Representation of women in STEM programs increases

Project Description

Bio-Inspired Solutions to Human Challenges

Goals and Objectives

[Redacted]

[Redacted]

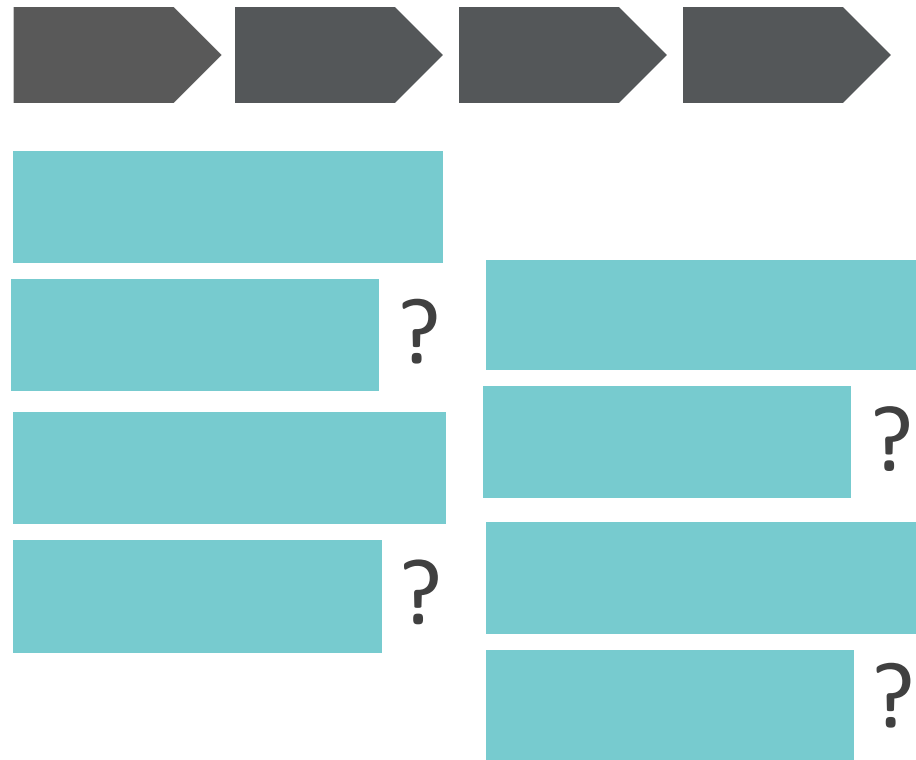
Broader Impacts

[Redacted]

[Redacted]

Logic Models: *How To Use*

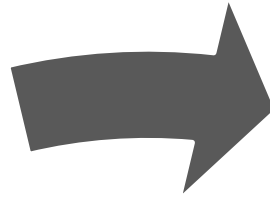
Evaluation Planning and Evaluation Question Writing



Use in Evaluation Planning

Evaluation is the systematic determination of a project's merit, worth, or significance

**1. Ask
important
questions**

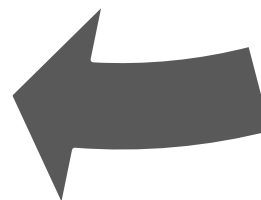


**2. Gather
evidence**

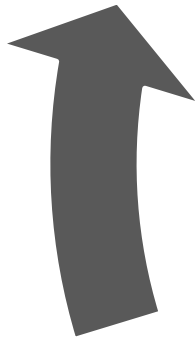
EVALUATION



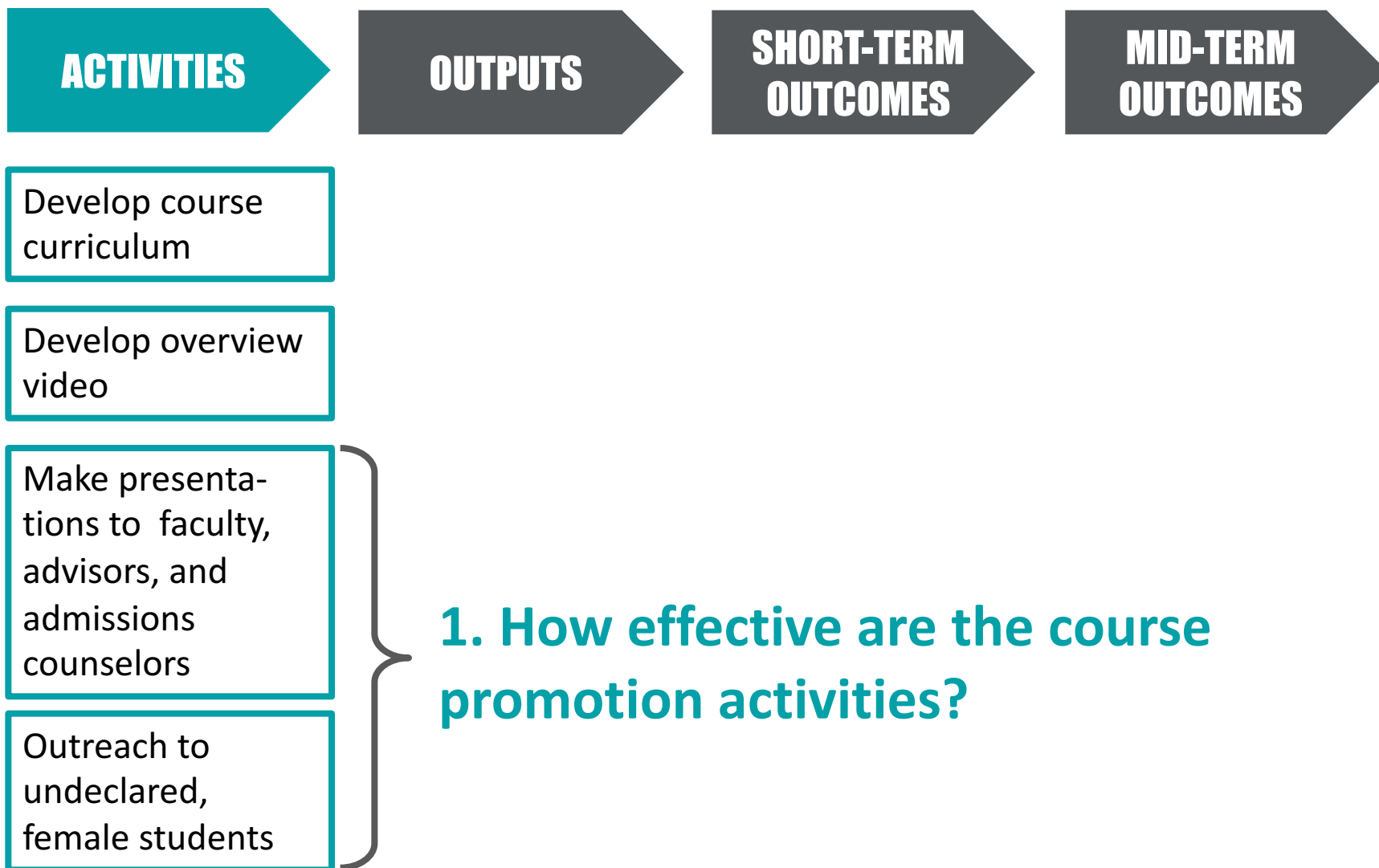
**3. Interpret
findings**



**4. Use the
information**



Evaluation Questions



Evaluation Questions

ACTIVITIES

OUTPUTS

**SHORT-TERM
OUTCOMES**

**MID-TERM
OUTCOMES**

Develop course curriculum

Develop overview video

Make presentations to faculty, advisors, and admissions counselors

Outreach to undeclared, female students

Course materials

Promotional video

Were students satisfied with the materials developed?

Evaluation Questions

ACTIVITIES

OUTPUTS

**SHORT-TERM
OUTCOMES**

**MID-TERM
OUTCOMES**

2. To what extent is the course attracting the intended audience?

Students enroll in course

Student interest in pursuing STEM degree increases

3. To what extent and how is the course influencing students' interest in pursuing engineering-related degrees?

Evaluation Questions

ACTIVITIES

OUTPUTS

**SHORT-TERM
OUTCOMES**

**MID-TERM
OUTCOMES**

4. To what extent and how is the project contributing to enrollment in engineering and other STEM programs?

Enrollment in engineering programs increases

Representation of women in STEM programs increases

EVALUATION QUESTIONS

Bio-Inspired Solutions to Human Challenges Project

1. How effective are the course promotion activities?
2. To what extent is the course attracting the intended audience?
3. To what extent and how is the course influencing students' interest in pursuing engineering-related degrees?
4. To what extent and how is the project contributing to enrollment in engineering and other STEM programs?



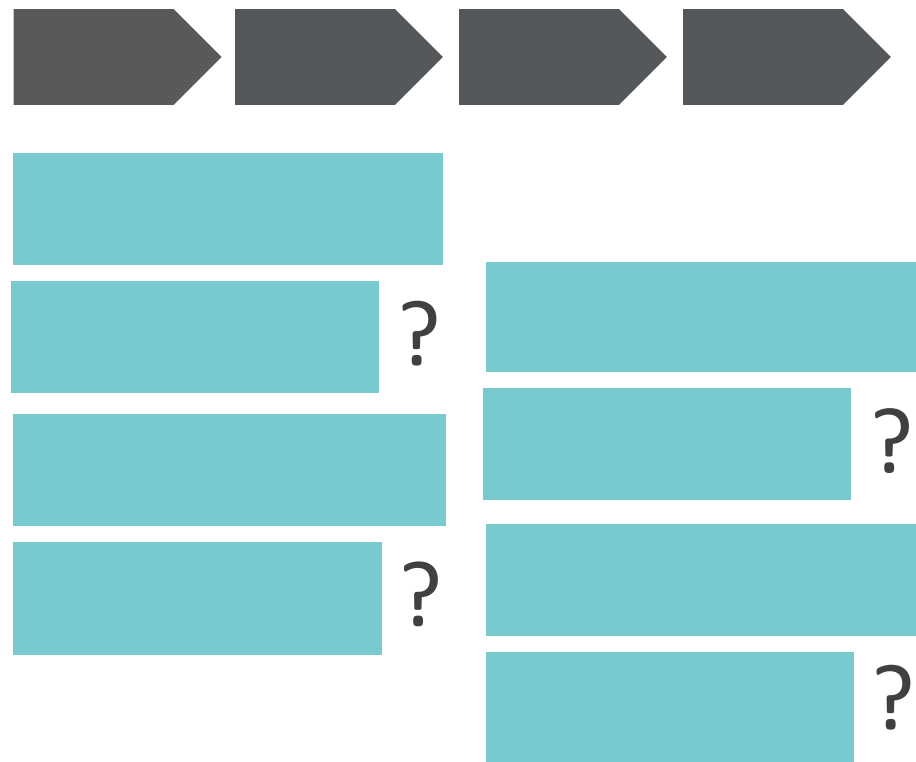
Process



Outcome

Logic Models: *How To Use*

Questions?



Logic Models: *How To Use*

Project Proposal Development

Project Description

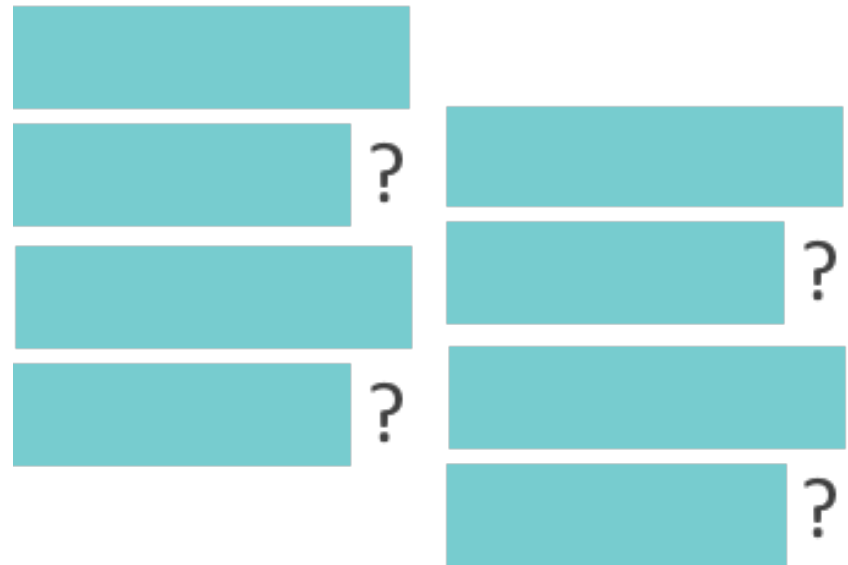
Bio-Inspired Solutions to Human Challenges

Activities

Curriculum Development

Video Development

Evaluation Planning and Question Writing



Want to learn more?

LOGIC MODELS

Getting them right and using them well

August 17, 2016 | 1-2 p.m. EDT

More Resources

www.evalu-ate.org



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- ANNUAL SURVEY
- EVALUATION DESIGN
- ATE RESEARCH AND EVALUATION
- DATA COLLECTION & ANALYSIS
- REPORTING AND USE

community members to engage around issues related to evaluation in the pursuit of excellence in technical education.

Blog

[Student Learning Assessments: Issues of Validity and Reliability](#)

[Using Learning Assessments in Evaluations](#)

[Designing Cluster Randomized Trials to Evaluate Programs](#)

Highlights

[Spring 2016 Newsletter](#)

[HI-TEC 2016](#)

[Understanding the Role of Evaluation in Federal Grants - Webinar Recording](#)

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[Worksheet: Logic Model Template for ATE Projects & Centers](#)

[Checklist: Principal Investigator "To-Do" Checklist: Before Launching Your Project Evaluation](#)

[Checklist: Getting Started with Evaluation](#)

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Feedback Form



Feedback Form
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- Not involved with the ATE program
- Principal investigator for an ATE project/center
- Other ATE project/center staff (indicate role): _____
- External evaluator for an ATE project/center
- Internal evaluator for an ATE project/center
- Other (indicate role): _____

2. Select the response that best represents your opinion in relation to each statement below:

	Strongly Disagree	Disagree	Agree	Strongly Agree
a. The session held my interest.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The session's content is relevant to my work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I will share what I learned from this session with my colleagues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I would recommend this session to my colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. For each workshop topic below, rate what your knowledge was BEFORE the workshop and what it is now, AFTER the workshop.

	BEFORE this workshop				AFTER this workshop			
	No knowledge	Minimal knowledge	Moderate knowledge	Advanced knowledge	No knowledge	Minimal knowledge	Moderate knowledge	Advanced knowledge
a. Fundamentals of a logic model	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. How to create a logic model	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. How a logic model could be used in <i>project proposals</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. How a logic model could be used in <i>evaluation planning</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. If you plan to use something you learned in this session, please describe how.

5. What aspect of this session needs the most improvement?

6. What aspect of this session was especially good?

At the Conference

Visit us at our
booth #716



Thank You!



Evaluation Resource Center for
Advanced Technological Education