Welcome!

CAUSAL
PATHWAYS

The Causal Pathways Initiative

Making visible the "black box" of philanthropic and systems change strategies, helping us collectively see how systems are (or are not) changing

An international network of evaluators, methodologists, philanthropic leaders, and more.

Focused on supporting philanthropy, other funders and their evaluation partners to open-up the black box of strategy and systems change by **building awareness, will, and skills to use evaluation approaches that can make sense of causal relationships** without depending on more traditional experimental and quasi-experimental approaches.

CAUSAL PATHWAYS

Mathematica®
Progress Together

Introduction to Contribution Analysis as a theory-based evaluation approach

Drew Koleros,
Principal Researcher
Mathematica

April 2024

A bit about me

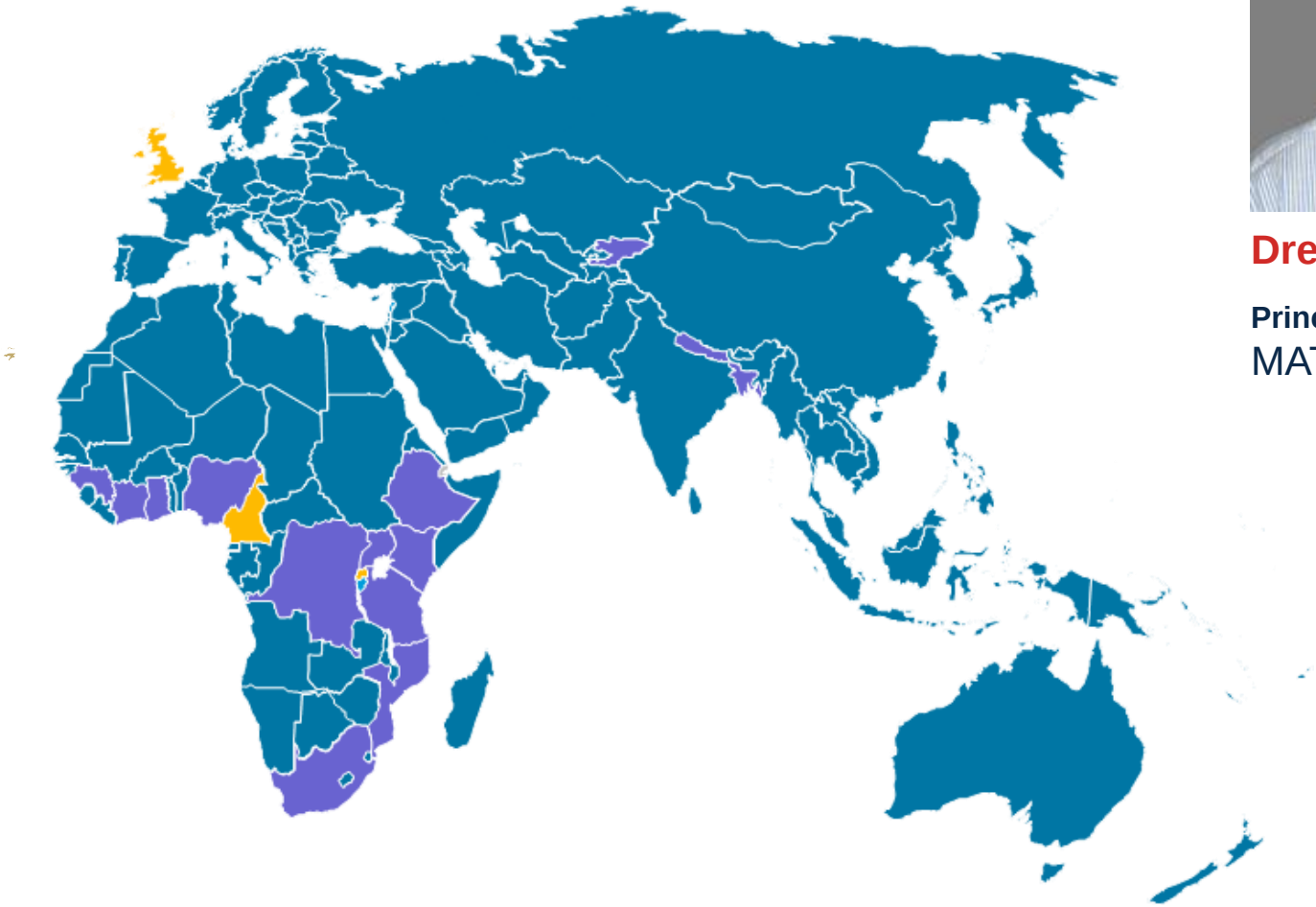
- Global health
- Health equity

- Food systems
- Market system

- Education and employment

- Climate mitigation and adaptation

- Advocacy and policy change / community power building



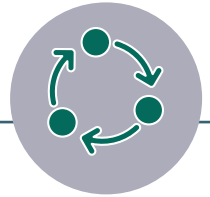
Drew Koleros (he/him)

Principal Researcher,
MATHEMATICA

Programs are getting more complex

Multi-year timeframe where many factors influence outcomes

- Different actors involved over time
- Involvement of several layers of government



Systems change efforts target multiple levers of change

- Multiple partners delivering different aspects of the initiative
- Numerous types of activities undertaken

Emerging outcomes and uncertainty

- Activities are flexible and responsive to changing context
- Feedback loops lead to adaptation in design and delivery

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

What's an evaluator to do?

Theory-based approaches can assist in addressing challenges to evaluating interventions in complex systems:

- Dealing with the inherent complexity of certain types of interventions
- Overcoming some of the limitations of more conventional experimental evaluation designs

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Causal inference

How do we know whether an intervention caused a change?

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Within the world or program evaluation, evaluators are faced with two main tasks:

1. **Measure the expected results of an intervention**
2. **Attribute those results to the activities of the intervention**

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Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Experimental and quasi-experimental design evaluations do both

Compare between two otherwise identical cases to isolate the effects of the intervention:

- Treatment – receiving the intervention
- Control – not receiving the intervention

Use counterfactual thinking to determine program attribution

- When everything is the same except the intervention, the difference between the two groups (treatment and control) is the effect caused by the intervention

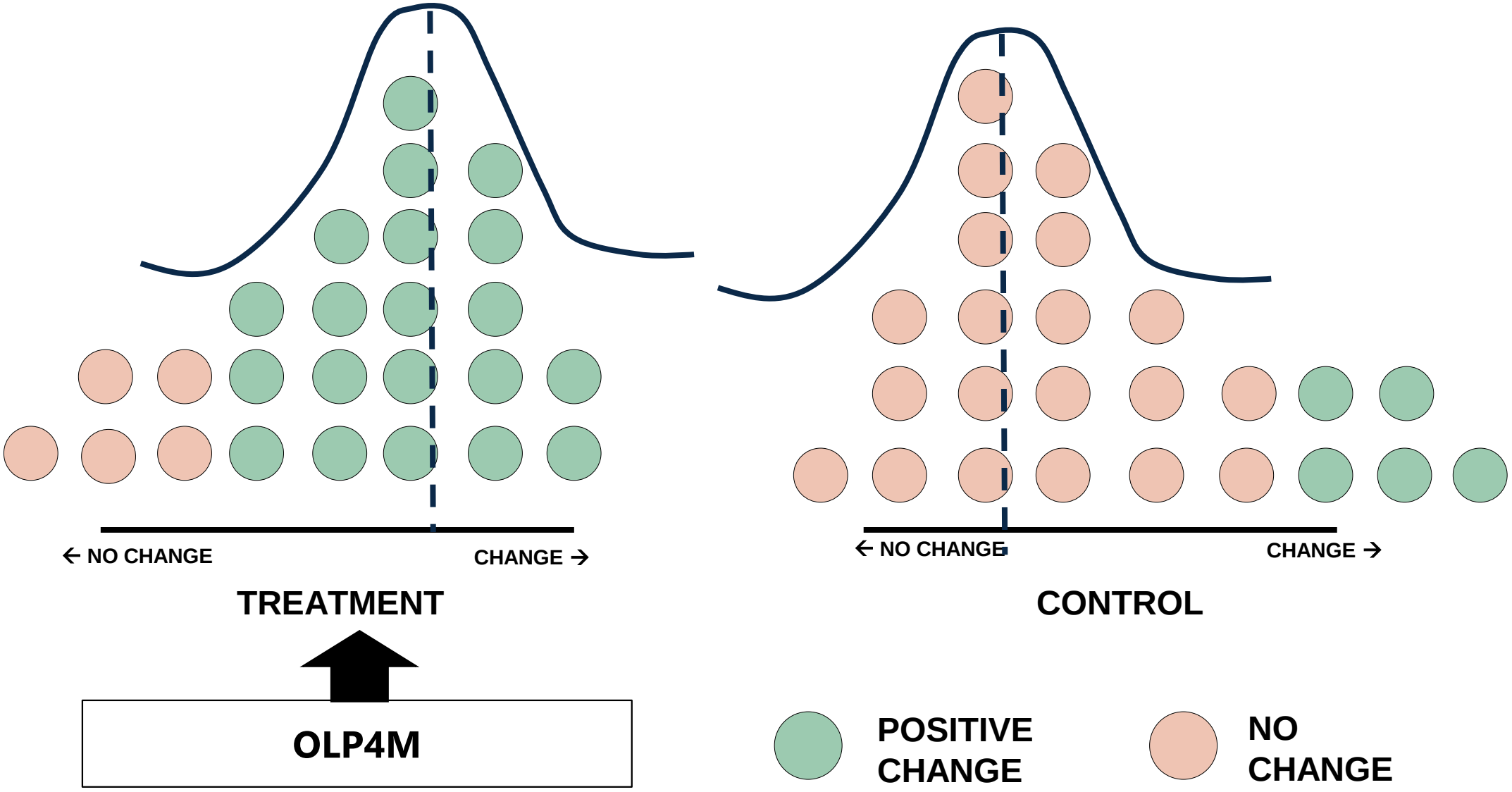
Mathematica

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

ONLINE LEARNING PLATFORM TO IMPROVE MATH SKILLS

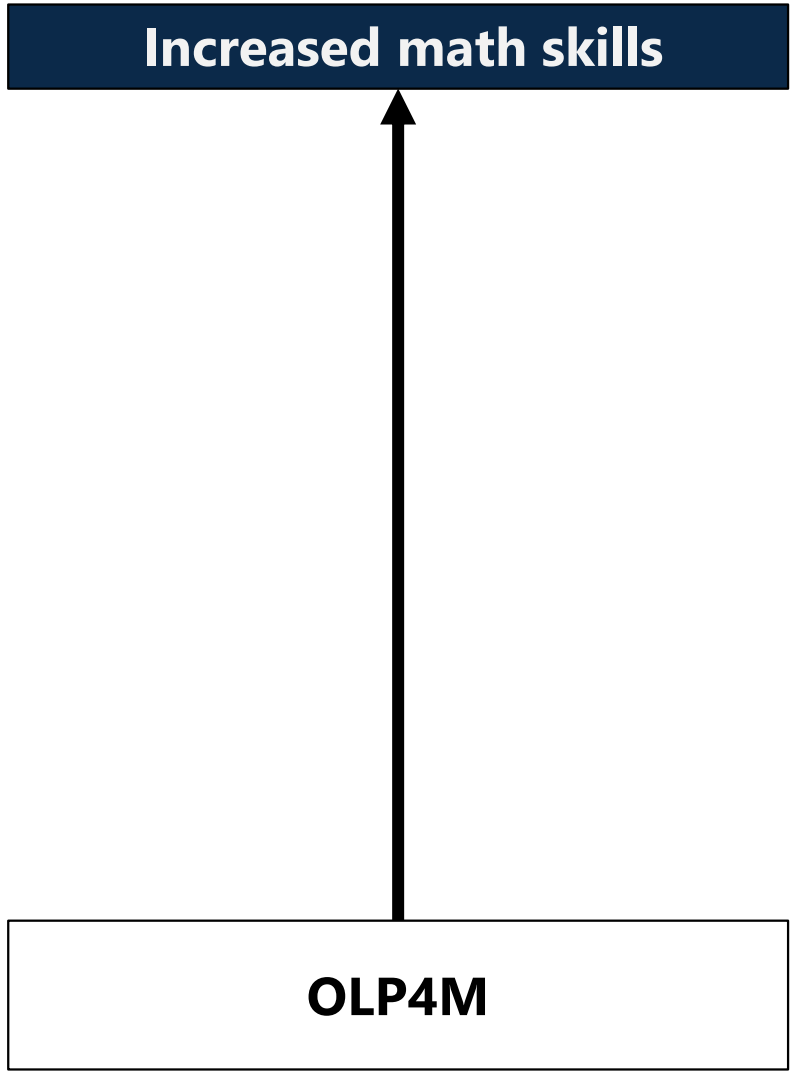
Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

(Quasi-) Experimental design of OLP4M



Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Shortcomings associated with (quasi-) experimental designs

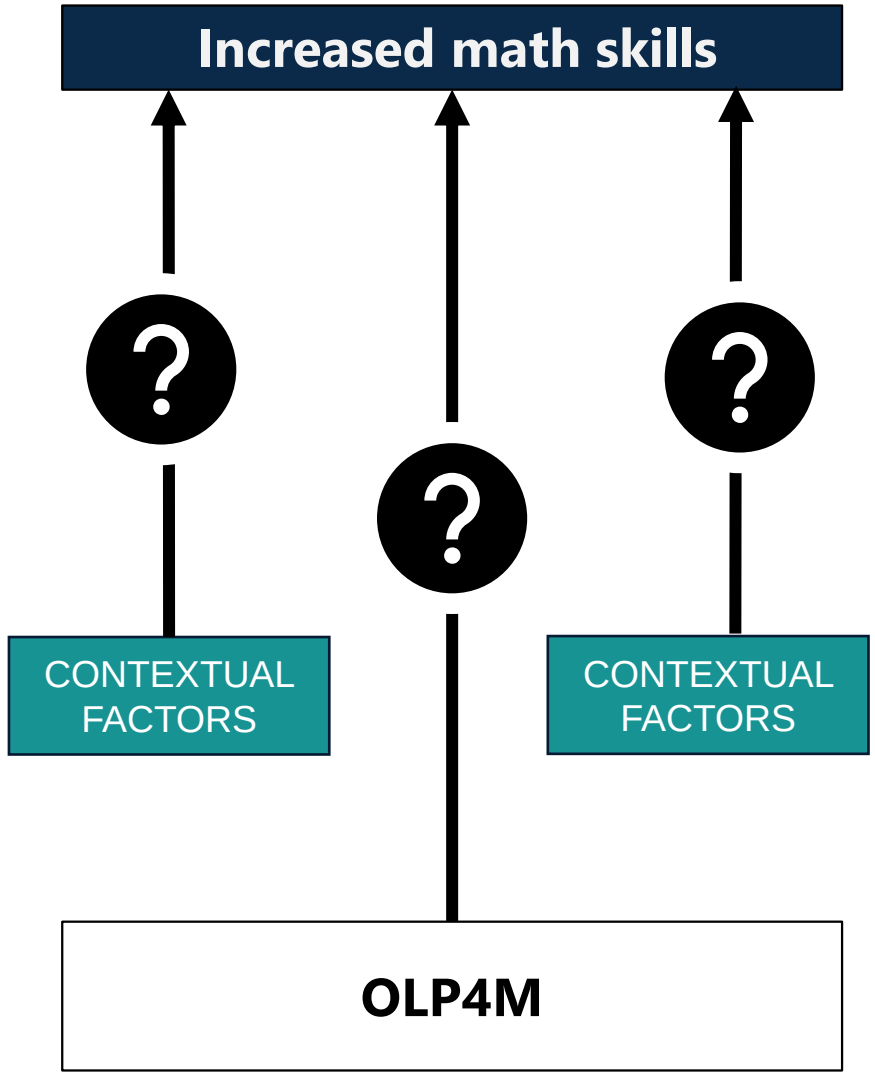


Practicality: In many contexts, these designs can be difficult or impossible

- Ethical considerations
- Sample size considerations
- Real world constraints
  - May not be an opportunity to manipulate the delivery of the intervention as required to demonstrate attribution
  - Resources or time required
  - Availability of data

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Shortcomings associated with (quasi-) experimental designs

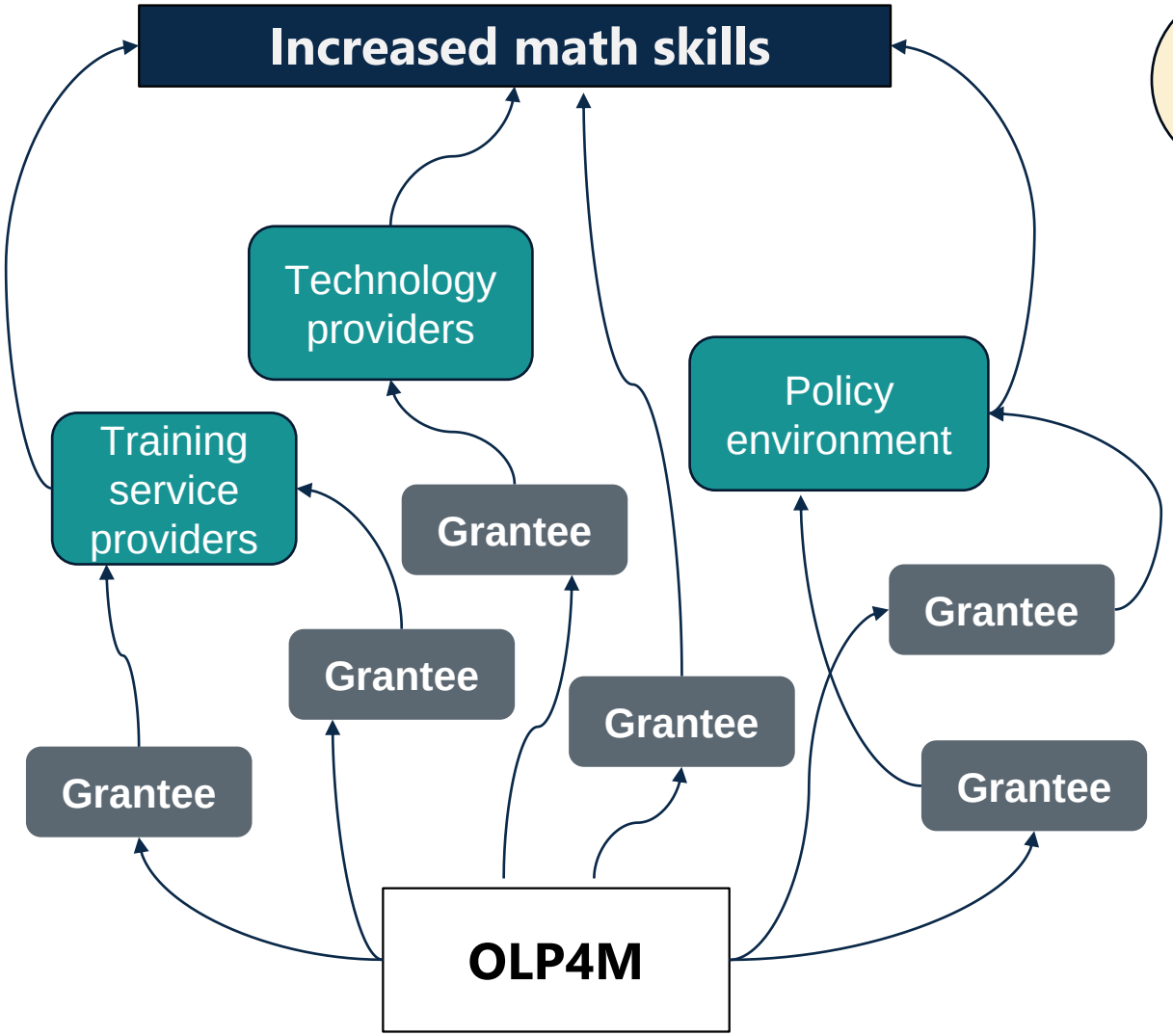


Unable to unpack the "black box"

- Not aimed at understanding *why and how the observed changes occurred*
- Can't answer questions such as:
  - What was it about the intervention or the context that caused the change?
  - In cases where the expected changes were not observed, what didn't work?
  - Was the underlying theory of the program wrong, or was it poor implementation?

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Shortcomings associated with (quasi-) experimental designs



Suitability for evaluating systems change

- These designs associate a single cause with a given effect
- Can't address key aspects of complexity:
  - Multi-year timeframes where many factors influence outcomes
  - Multiple efforts targeting multiple levers of change
  - Emerging outcomes and uncertainty

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

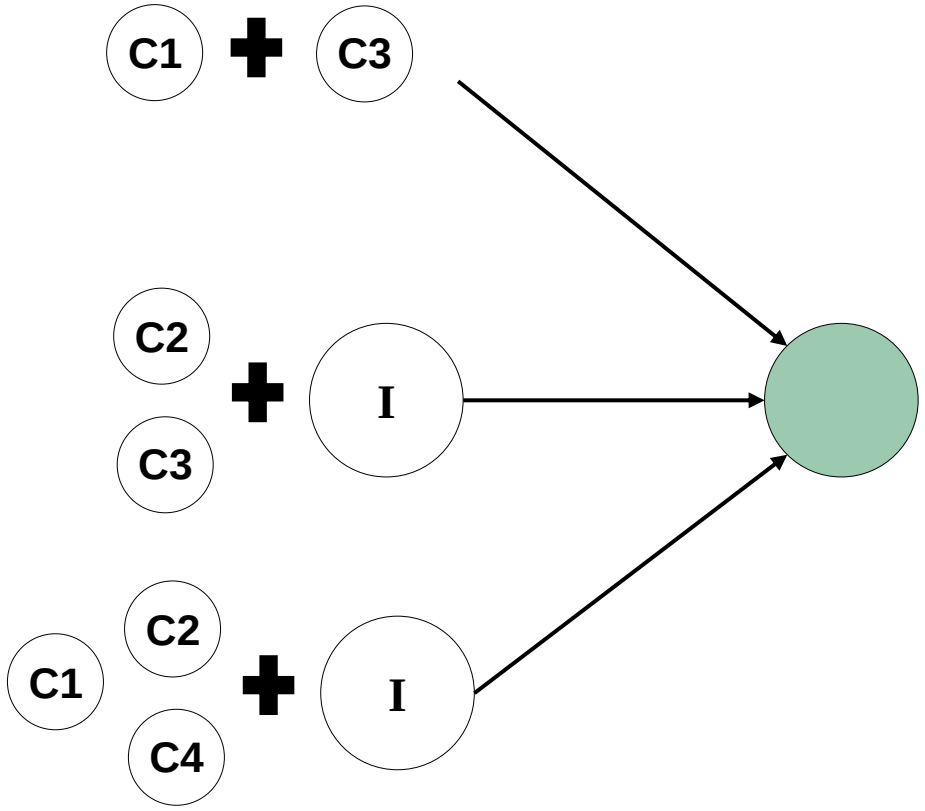
What to do when (quasi-) experimental designs are either impossible or unsatisfactory?

- **A range of evaluation designs and methods exist that can help in these situations**
- **These designs provide a way to assess the extent to which an intervention has *produced or influenced* observed results by drawing on alternative causal inference approaches**
- **They open the "black box" by examining what role the intervention played in producing the observed results**

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Configurational approaches / case-based comparisons

- **Use set-analytics to explore the multiple combinations of causes that lead to an effect**
- **Causal inference is implied through comparison of cases with similarities and differences**
- **Various combinations of ‘attributes’ may lead to the same outcome**



Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

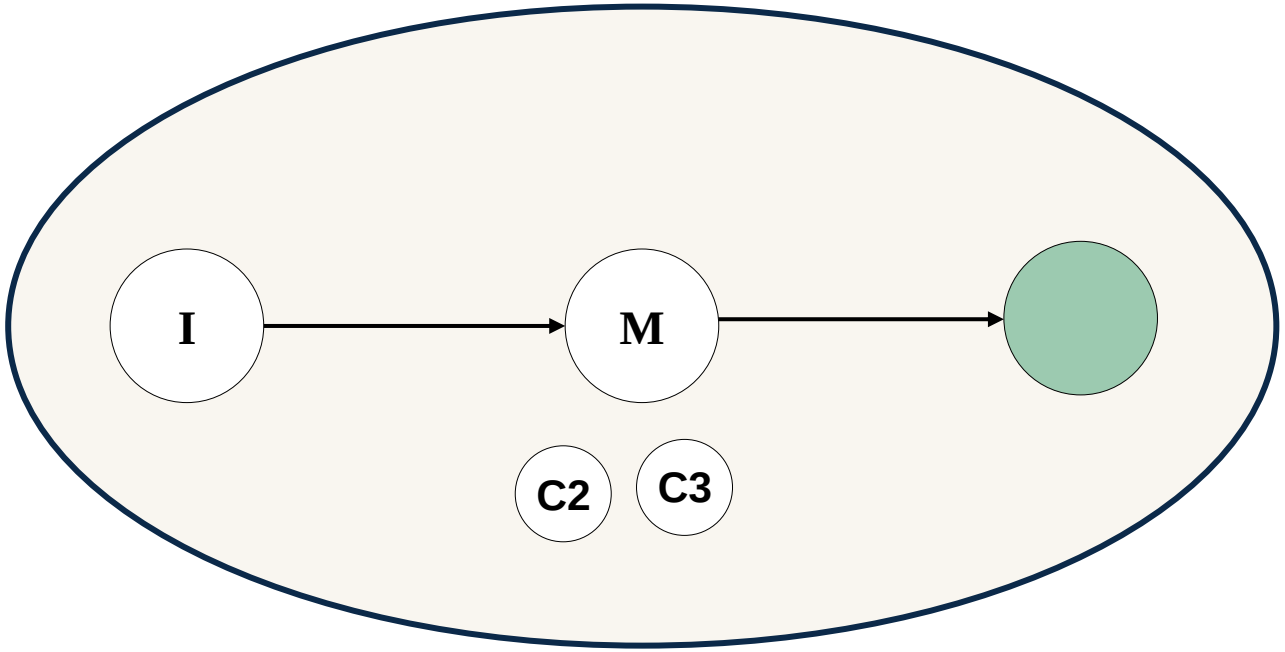
Theory-based approaches to evaluation

/ Generative causation

- Provide a detailed description of a causal mechanism (M) that led to a specific event

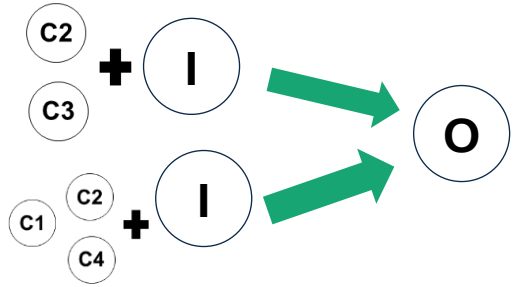
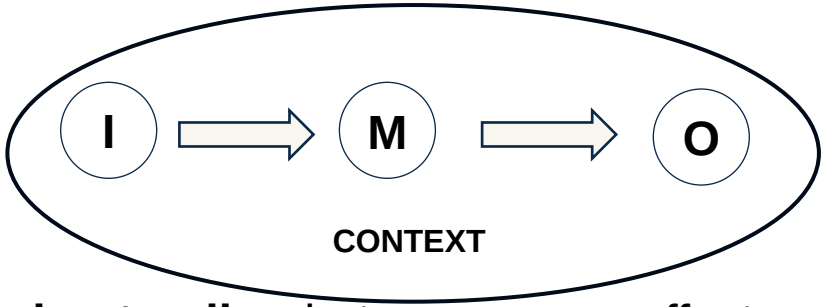
/ ‘Unpacking causal arrows’

- Connecting cause and effect through (more) in-depth theoretical analysis



Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Causal inference approaches

EVALUATION DESIGN APPROACH	PRIMARY PURPOSE	EVALUATION QUESTIONS
Experimental and quasi-experimental designs • RCTs • Statistical designs	 Identifying **average effects**	• Does it work? • To what extent did it work?
Case-based comparisons • Qualitative comparative analysis (QCA)	 Identifying **heterogeneous effects**	• How does the intervention work in combination with other interventions or factors to make a difference?
Theory-based approaches • Contribution analysis • Realist evaluation • Process tracing	 **Understanding** heterogeneous effects	• Why and how does it work? • For whom? • Under what conditions?

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Theory-based approaches to evaluation

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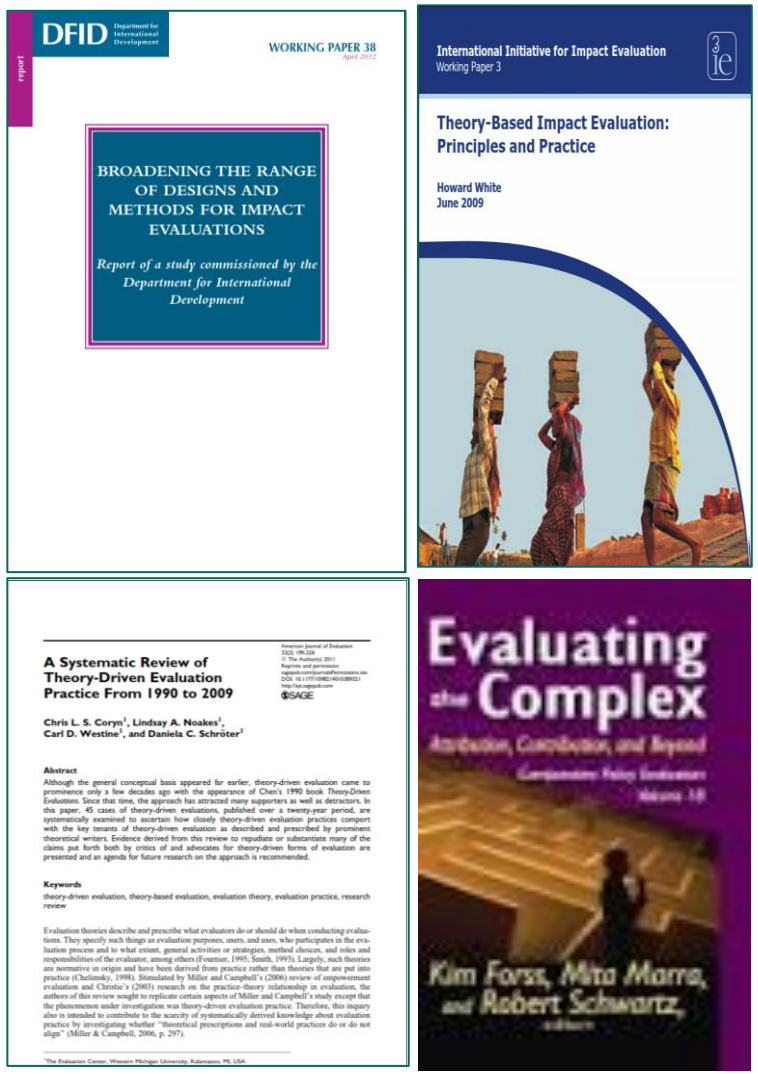
Theory-based approaches to evaluation



- **An approach to evaluation and not a specific method or technique**
- **A way of structuring an evaluation and undertaking analysis**
- **Use an explicit theory of change to draw conclusions about whether and how an intervention contributed to observed results.**

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Context and causation in theory-based approaches

CONTEXT

- Pay explicit attention to the context
- Understand the contextual circumstances under which cause leads to effect
- Explicitly identified and/or represented through causal assumptions underpinning a theory

CAUSATION

- Understand a program's contribution through a generative interpretation of causation, rather than through comparison to a counterfactual
- In-depth theoretical analysis to identify and/or confirm causal processes and the supporting factors at work in context

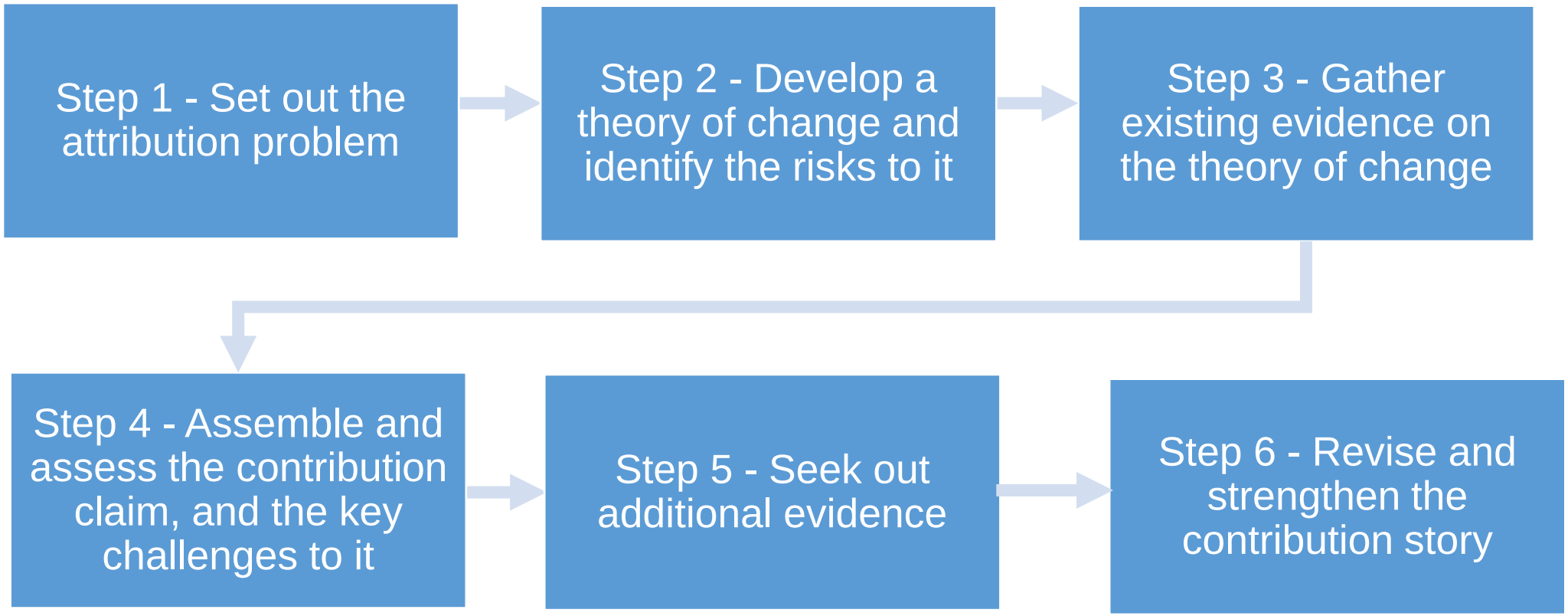
Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Contribution Analysis

- **Theory-based approach that uses an intervention's theory of change as the basis against which to assess evidence regarding its progress and achievements**
  - Strength of theory of change is critical to the approach
  - Accommodates different types of data and evidence
- **Changes in outcomes are the result of multiple factors, including the intervention**
  - Several factors acting together to bring about change
  - Each factor acts as a contributory cause
  - None being sufficient on its own to bring about the desired change
- **Answers questions related to how, why, and under what conditions**
- **Outcome of a contribution analysis is a contribution story or contribution claim about how, why and under what conditions an intervention contributed to an outcome**
  - The aim is to make credible causal claims about the contribution an intervention is making to any observed results

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Six steps of contribution analysis



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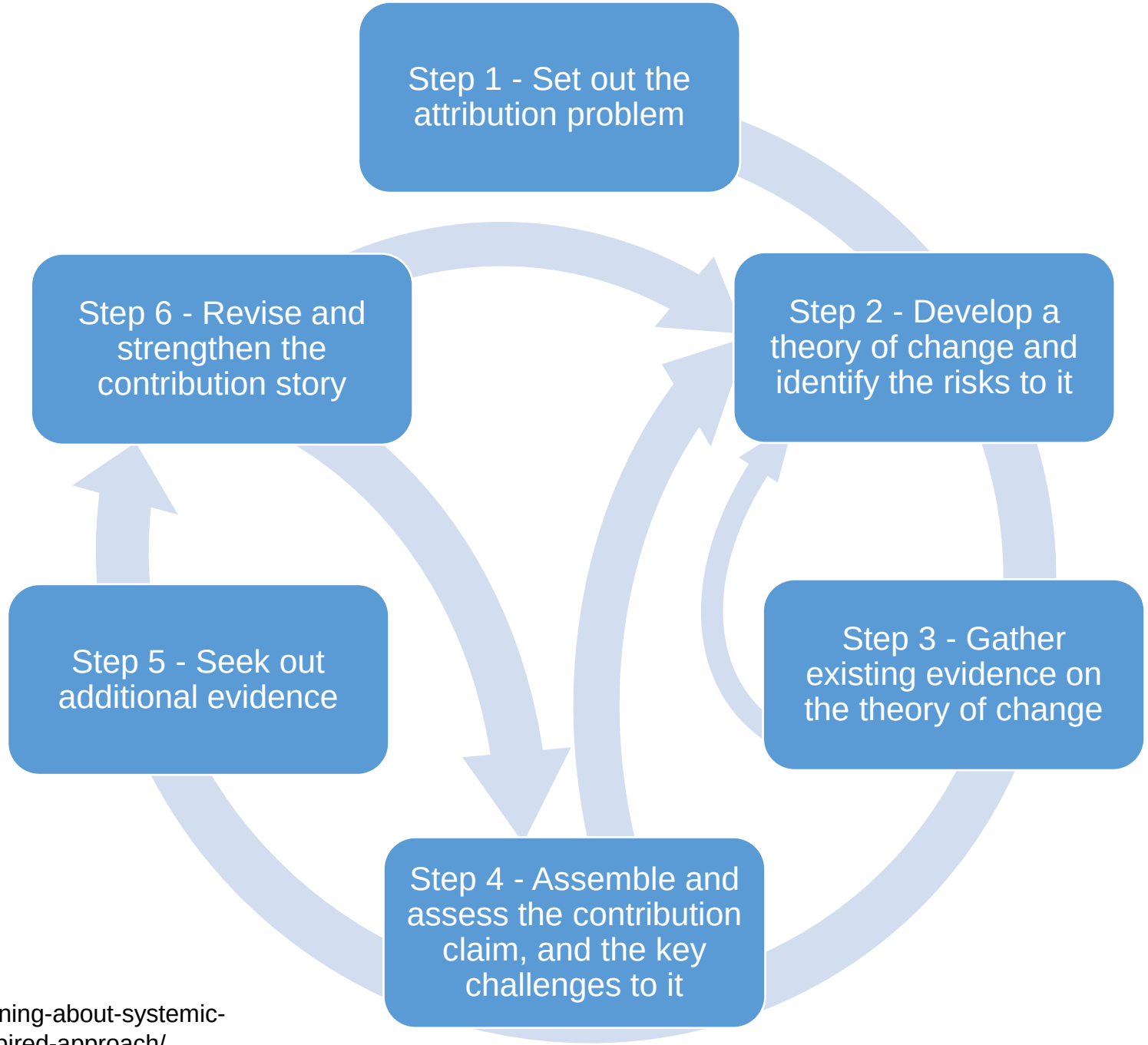

https://www.ids.ac.uk/opinions/learning-about-systemic-change-a-contribution-analysis-inspired-approach/

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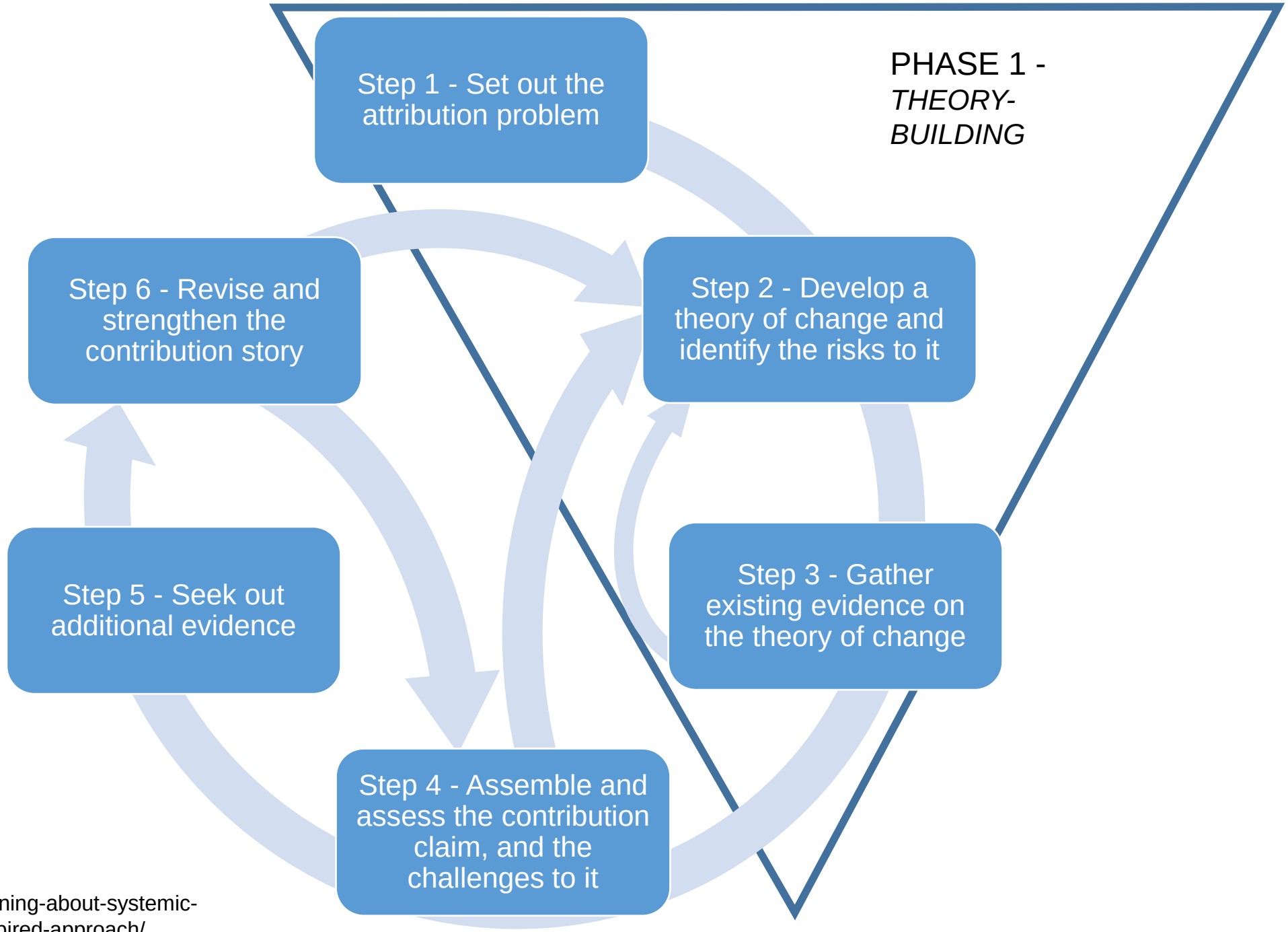

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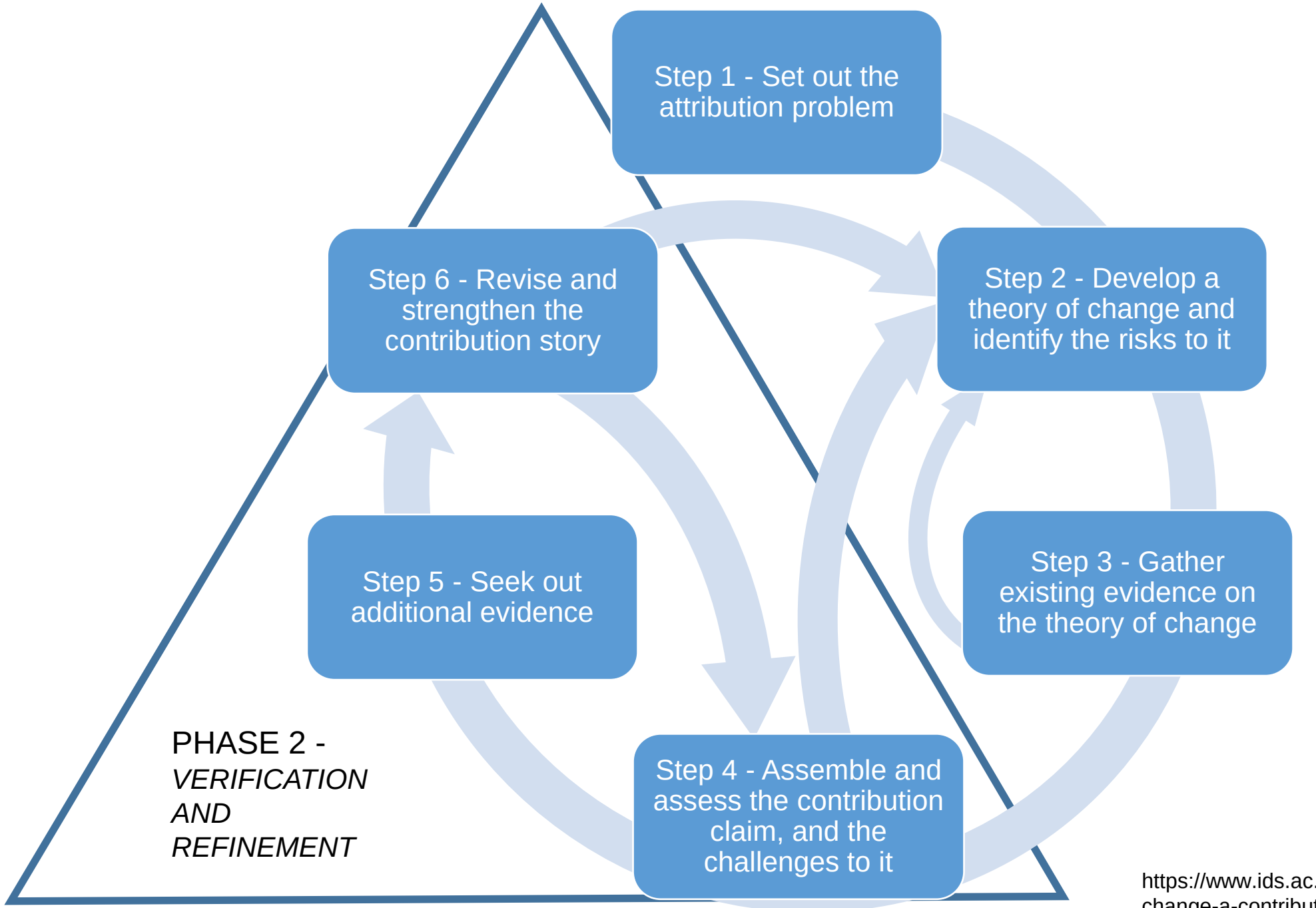

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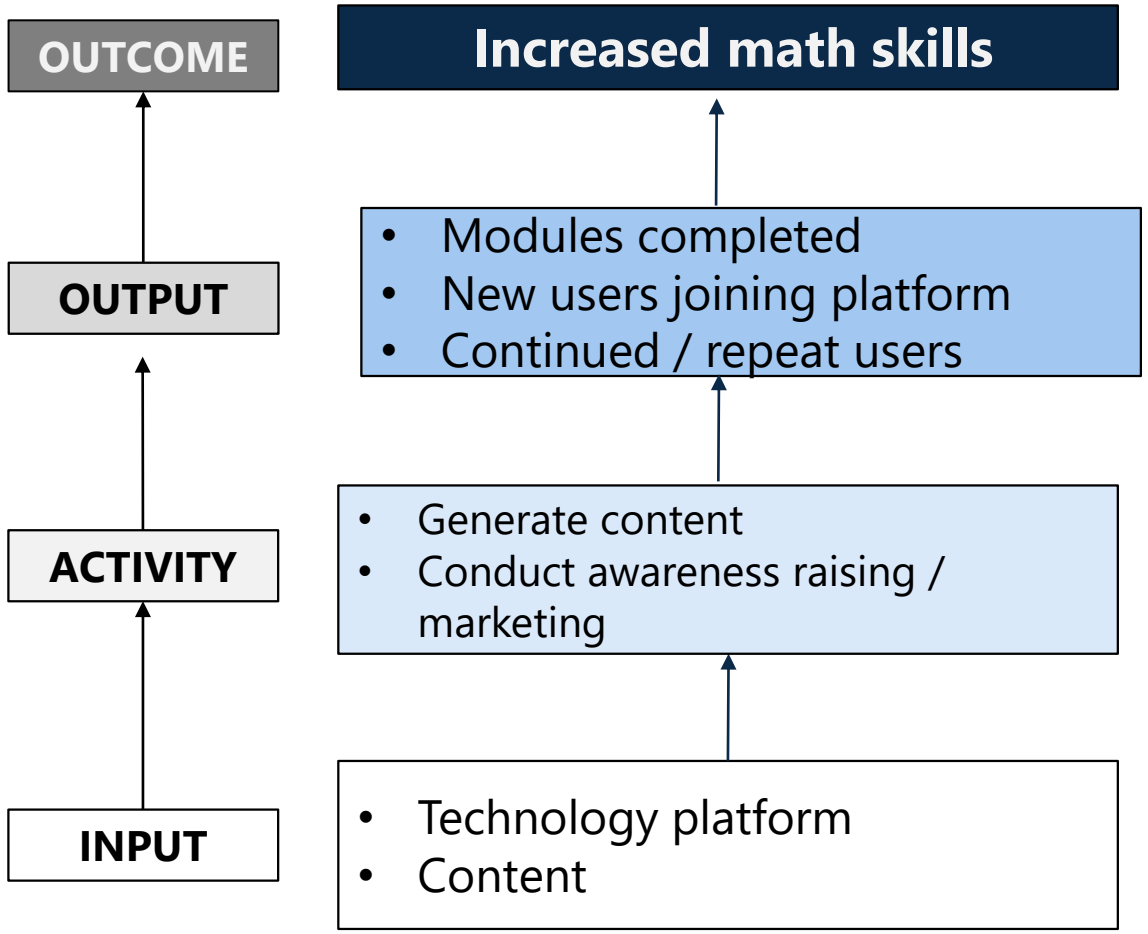
CRITICALITY OF A ROBUST THEORY OF CHANGE

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

OLP4M Logic Model



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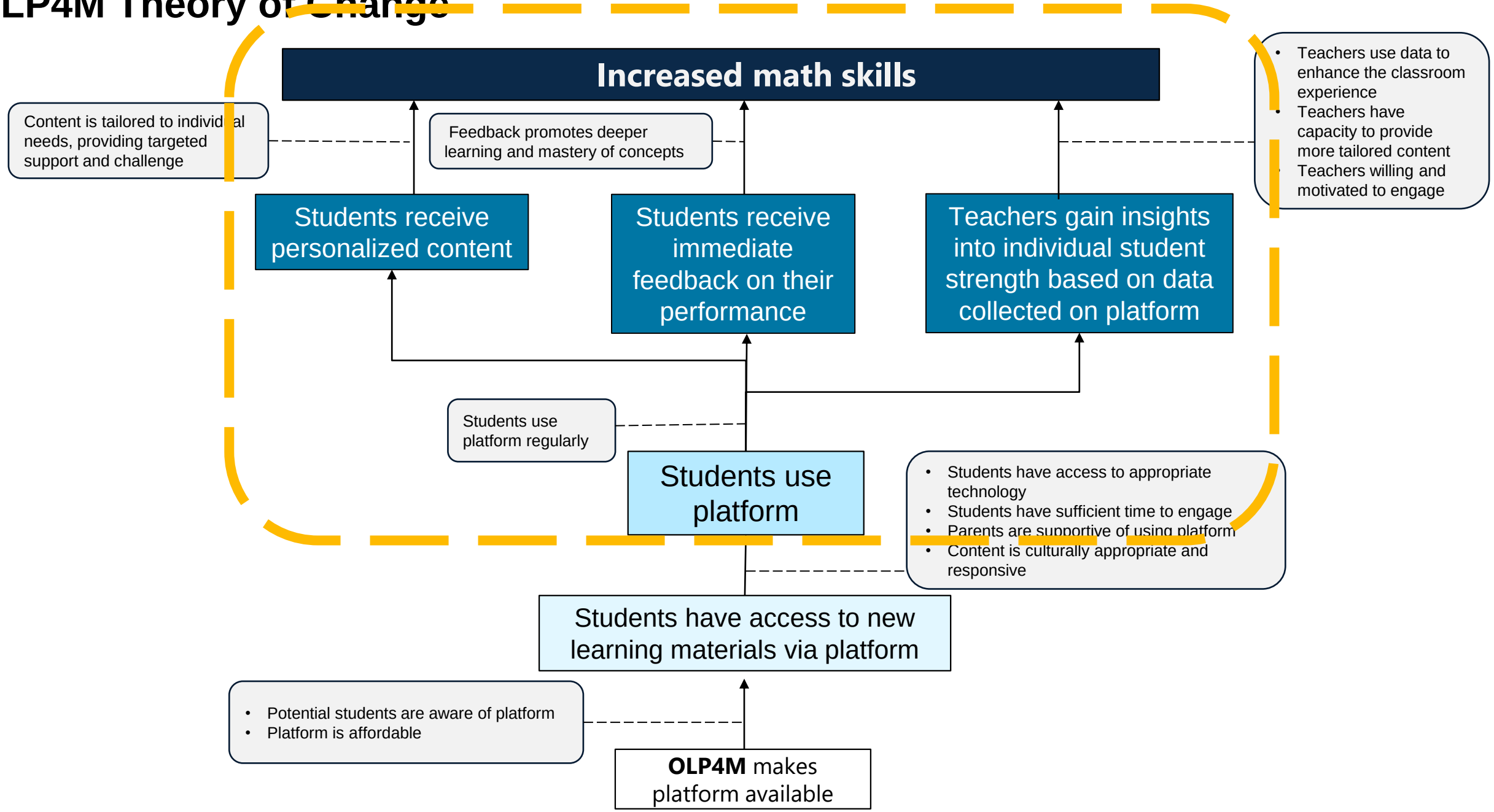
Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

OLP4M Theory of Change



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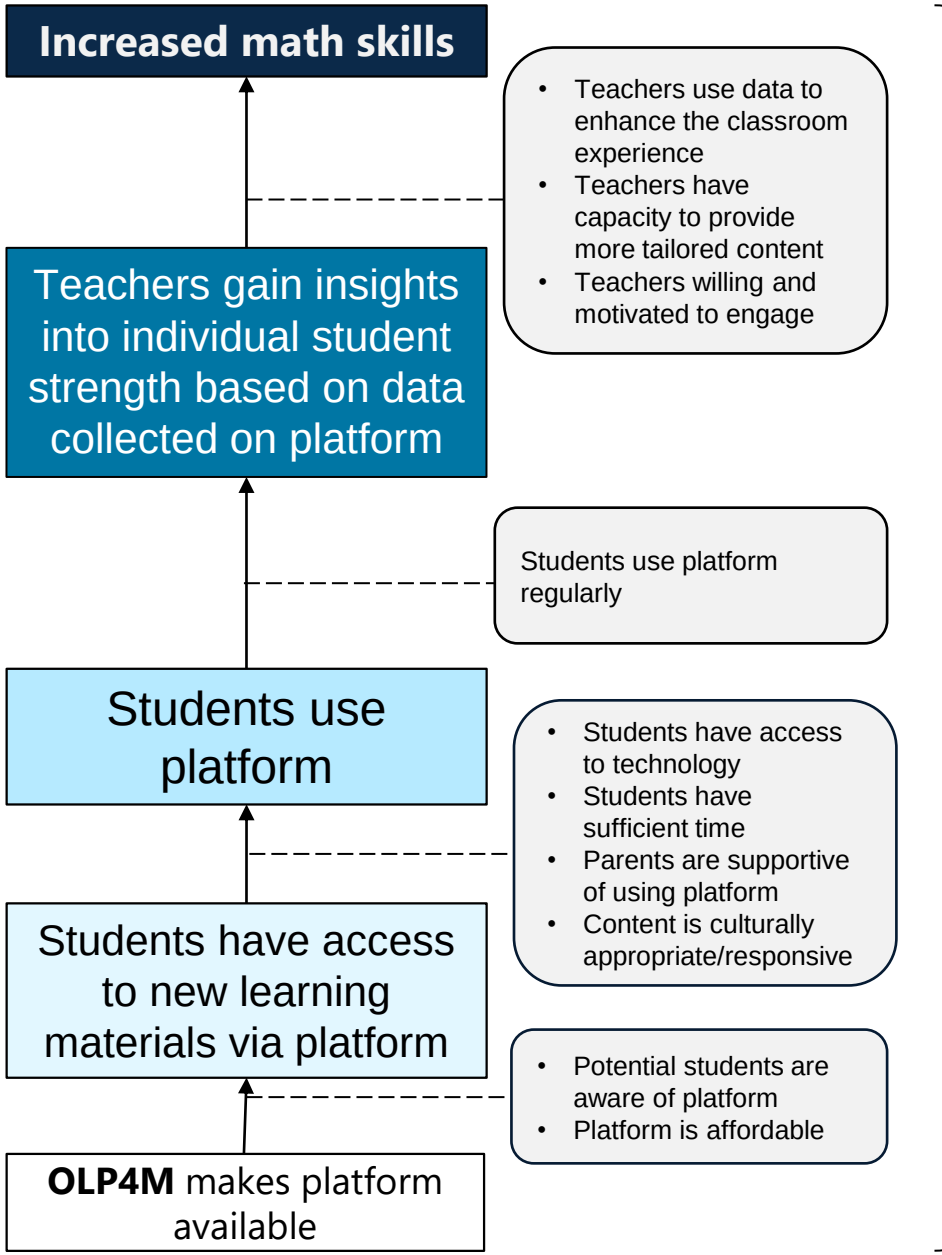
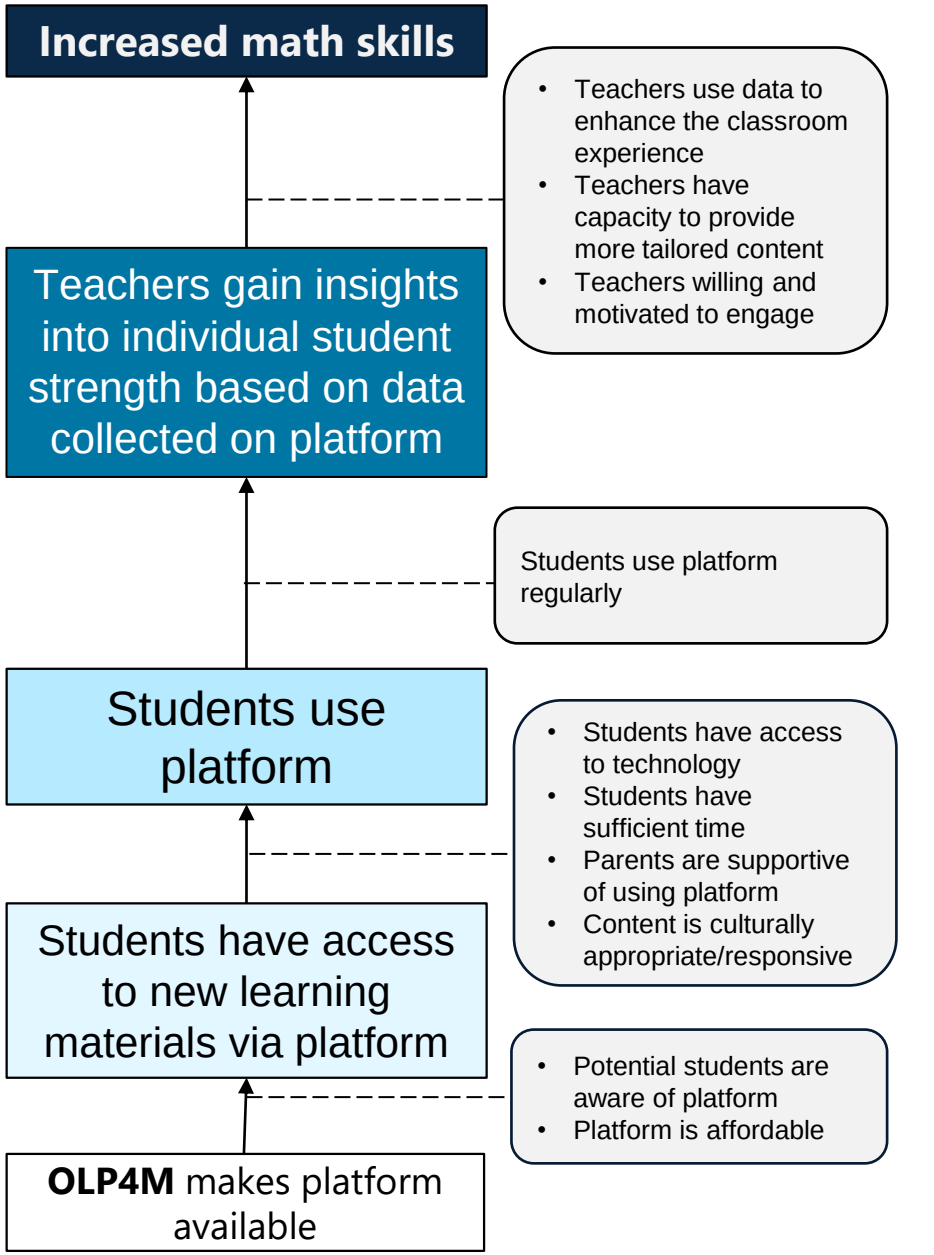


Testable hypothesis of causal mechanism at work

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.



Did math skills improve among students using the platform?

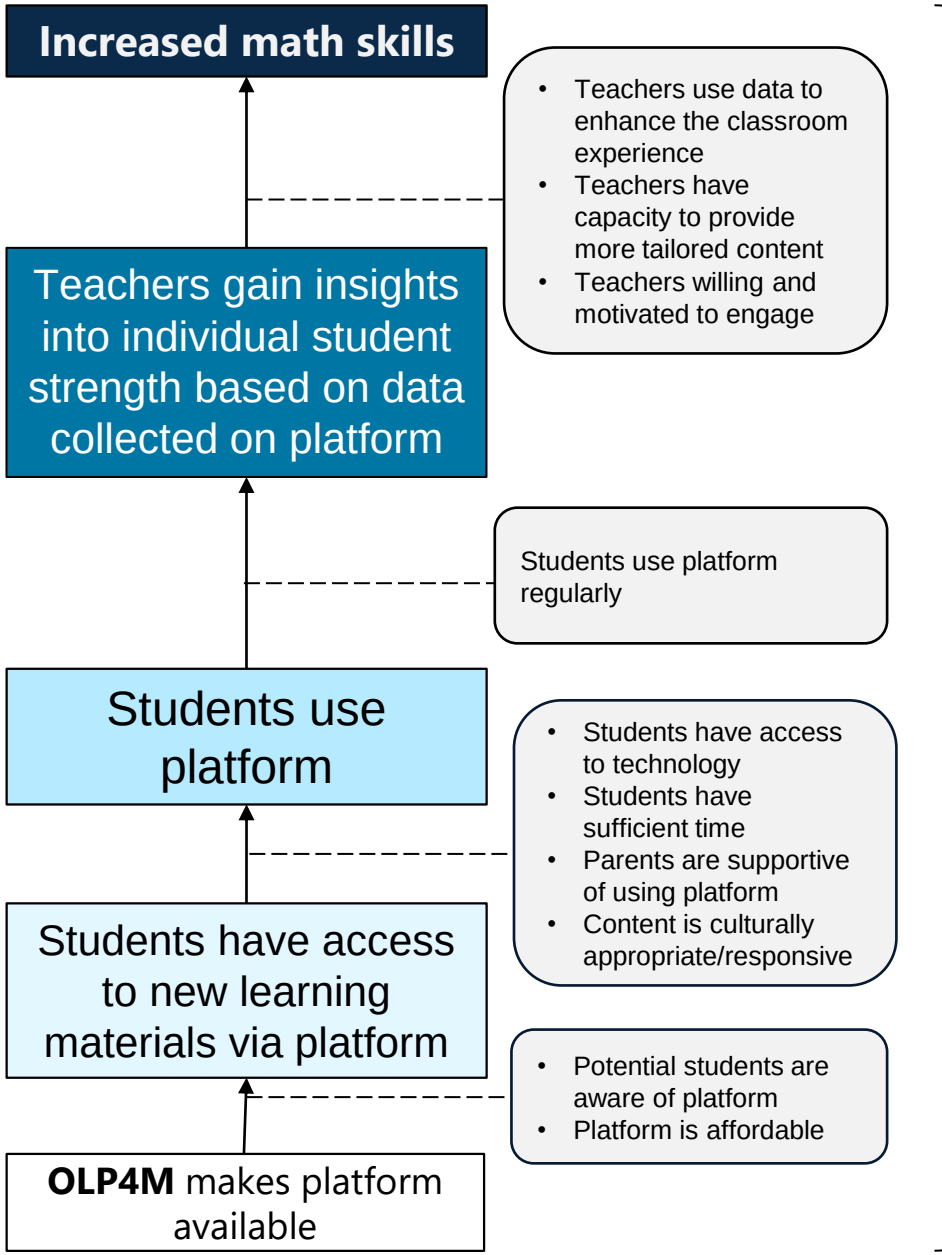
What individual and other contextual factors help explain teachers' level of engagement with the data generated on the platform?

How did teachers use / engage with data generated on the platform?

How often did students use / engage in the platform?

Did students use / engage in the platform?

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.



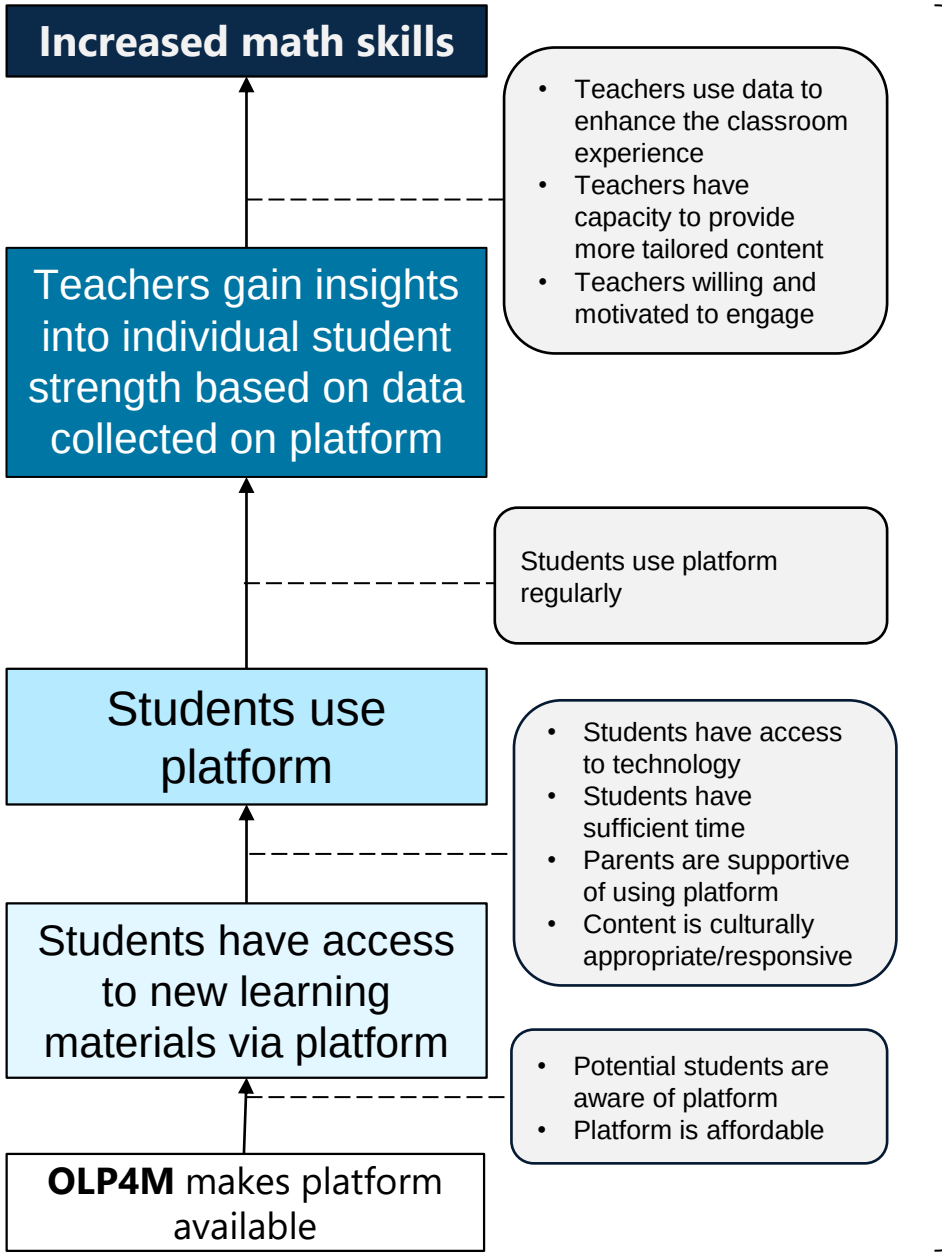
Gathering data to test our hypotheses and answer evaluation questions

- Evidence against each step in the causal impact pathway
- Evidence against causal link assumptions

Mixed methods data sources

- Quantitative and qualitative
- Primary and secondary
- Internal and external

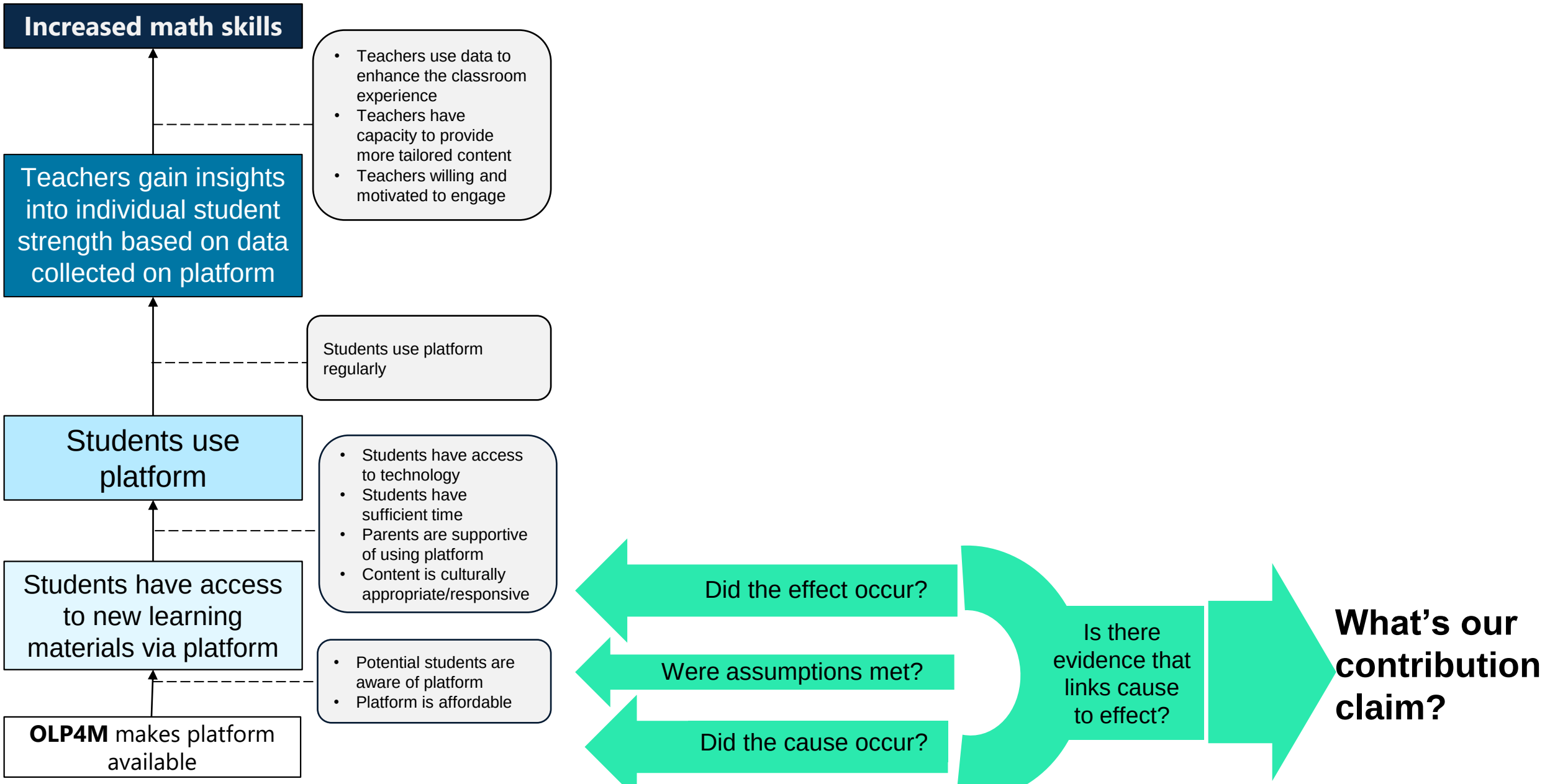
Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.



Analyze empirical evidence gathered along the theory of change

- Theory building and theory refining
- Strength of evidence confirming / disconfirming the hypothesis / causal mechanism
- Ruling out alternative hypotheses
- Identifying specific contextual factors that help explain why / how the intervention worked in different contexts

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.



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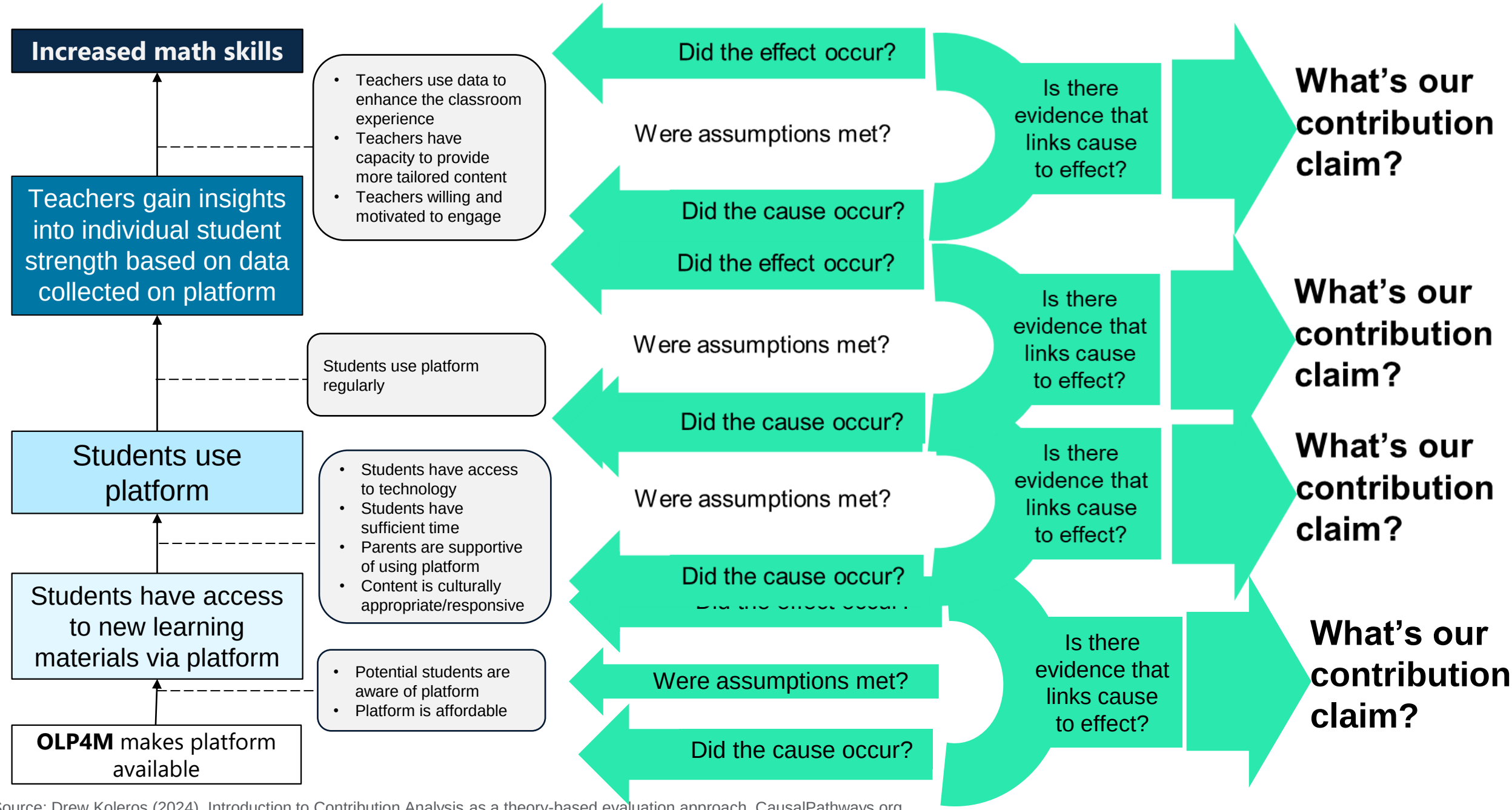

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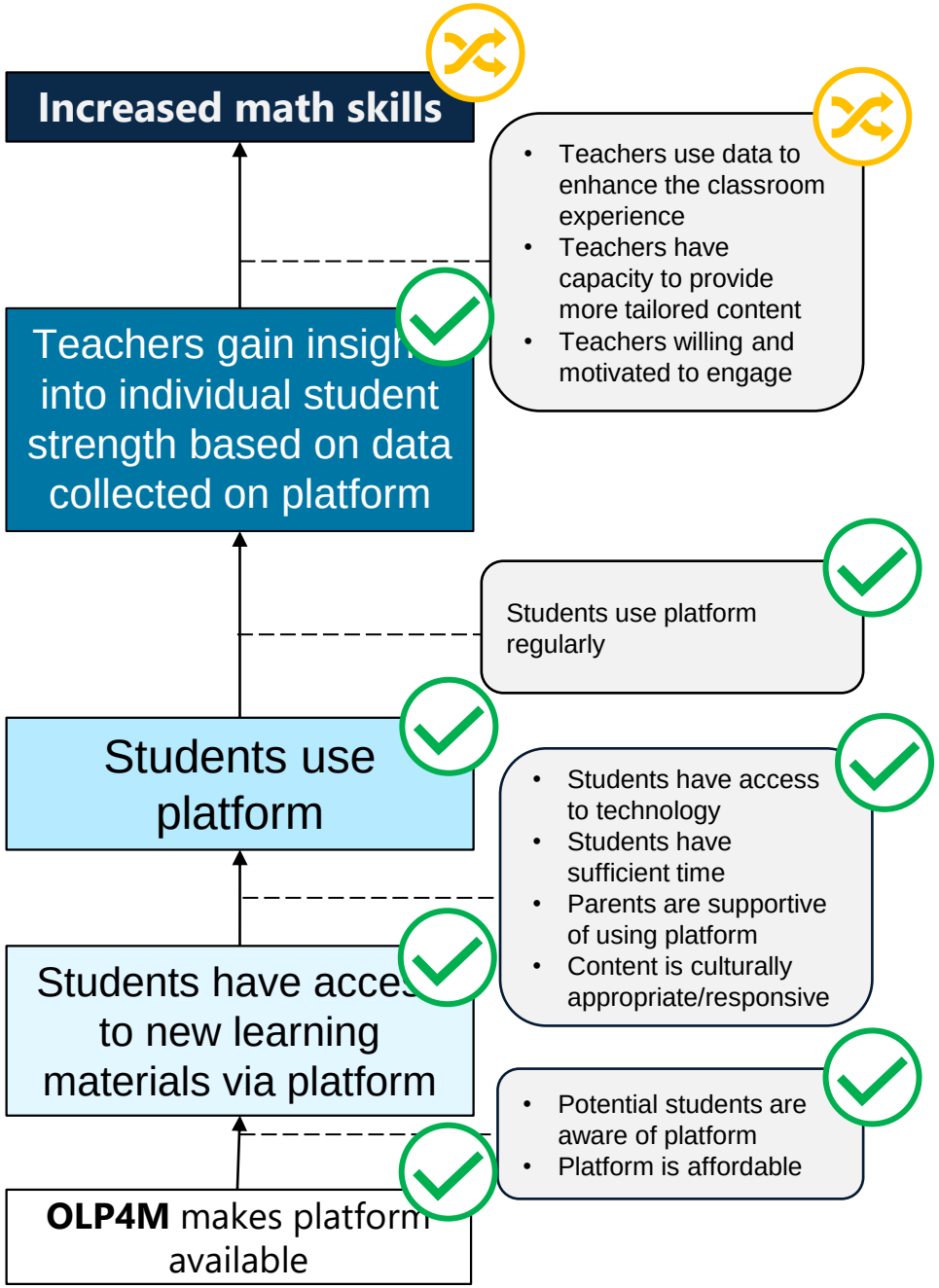

Output of contribution analysis

- **Contribution claim**
- **Contribution story**
- **Contribution narrative**
- **Impact story**

- **Complex narrative that presents multi-source evidence supporting your contribution claim**

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Quality of a “contribution story”

1. ***Plausibility***: Is the theory of change plausible?
2. ***Implementation according to plan***: Was the program implemented with high fidelity?
3. ***Evidentiary confirmation of key elements***: To what extent are the key elements of the theory of change informed by or based on existing evidence?
4. ***Identification and examination of other influencing factors***: To what extent have other influencing factors been identified and accounted for?
5. ***Discard alternative explanations***: To what extent have the most relevant alternative explanations been disproved?

Mayne, J. (2012). "Contribution analysis: Coming of age?" Evaluation 18(3): 270-280.

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Key messages on contribution analysis

- Theory-based approach
- Answers questions related to how, why, and under what conditions
- Typically described in six steps however these steps are iterative and flexible
  - Theory building and theory refining
- Strength of theory of change is critical to the approach
- Accommodates different types of data and evidence
- Outcome of a contribution analysis is a contribution story or contribution claim about how, why and under what conditions an intervention contributed to an outcome

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Further readings

- Government of Canada. (n.d.). Theory-Based Approaches to Evaluation: Concepts and Practices. Treasury Board of Canada Secretariat. Retrieved from https://www.canada.ca/en/treasury-board-secretariat/services/audit-evaluation/evaluation-government-canada/theory-based-approaches-evaluation-concepts-practices.html#toc2
- Koleros, A., and J. Mayne. “Using Actor-Based Theories of Change to Conduct Robust Evaluation in Complex Settings.” Canadian Journal of Programme Evaluation, vol. 33, no. 3, 2019, pp. 292-315
- Mayne, John. (2019). Revisiting Contribution Analysis. Canadian Journal of Program Evaluation. 34. 10.3138/cjpe.68004.
- UK Department for International Development. (2012). Chapters 3 and 4. Broadening the Range of Designs and Methods for Impact Evaluations. DFID Working Papers, No. 38. Available at https://www.oecd.org/derec/50399683.pdf

Source: Drew Koleros (2024). Introduction to Contribution Analysis as a theory-based evaluation approach. CausalPathways.org.

Thank you!

Resources from the Causal Pathways Initiative

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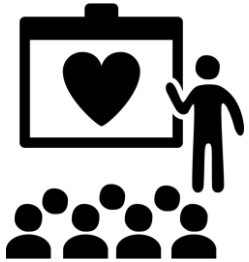
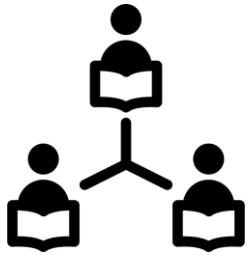


Presentations & trainings to build understanding and will

American Evaluation Association

Available to attend other events by request

Virtual 101 level training available on request



Resources to support understanding and action

Pending: BetterEvaluation.com updated resource hub on causal pathways

Case studies to provide overall stories and more detailed examples

Learning and acting together with support

Brain Trust to help funders work through tough questions with field experts

Pending: Peer learning spaces and early career support

www.causalpathways.org

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