

INTRODUCTION

Implementation and Process Evaluation (IPE) is a critical component of EEF's approach to evaluation. Whether or not Impact Evaluation has found a difference between the schools where an intervention¹ has been implemented and the schools in the control group (teaching as usual), IPE can help explain *why* the intervention has been successful or not, what factors have contributed to this result and what key lessons we can learn about educational practice and research. The EEF has been streamlining its approach to evaluation and has recently published [new IPE guidance](#) for evaluators to use in the trials we fund. A significant section of this guidance describes recommendations for developing logic models.

The role of the intervention developer and/ or delivery team² in producing the logic model is very important. They are the ones who understand best of all what the programme consists of and what it is aiming to achieve. The role of the independent evaluator is also very important in teasing out the critical ingredients of the intervention and the causal links between these and the desired outcomes. Furthermore, it is the independent evaluator who collects and analyses data to test the relationships represented in the logic model. Close collaboration between the teams is, therefore, essential in developing this visual representation of the programme.

This paper aims to help delivery teams draft logic models for EEF projects at the pre-project approval. The paper 1) explains what a logic model is, 2) clarifies the core components that the EEF recommends are included in logic models, 3) explains the shared responsibilities of the delivery team and evaluation team in developing the model, and 4) it summarises the recommended development process. We are hoping the paper will help facilitate high-quality logic models that can guide the best possible evaluation designs for the programmes we fund.

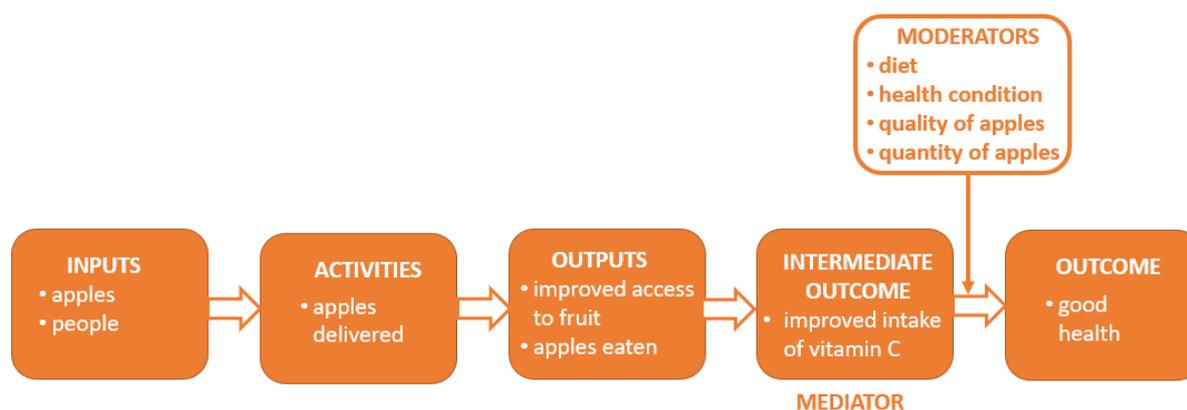
¹ We use intervention and programme interchangeably.

² Used interchangeably in this paper, though responsibilities will vary from one project to another.

1) WHAT IS A LOGIC MODEL?

A logic model is a visual representation summarising the core components of a programme or intervention, its desired outcomes and the (expected/ hypothesised) causal relationships between these. In other words, the ‘story’ of what the programme is, how it is expected to work and what results it is intended to achieve. For example, this is how we might represent the ‘story’ of the proverb ‘An apple a day keeps the doctor away’³.

Fig. 1. Simple logic model example



Looking at the familiar proverb in this light, we understand that it is actually vitamin C that helps improve health, the apple being just an accessible carrier. (Apples help improve health *because of* and *through* their vitamin C content, among other things.) We can also see there are a number of factors that will influence (or ‘moderate’) the effect of apples on the outcome. If we eat apples but have a generally unhealthy diet, the impact will be less positive. If we are seriously ill, or we eat apples with low vitamin C content, the outcome will be less positive than if we are fit and eat fresh apples regularly.

2) DEVELOPER AND EVALUATOR RESPONSIBILITIES

Developers applying to the EEF to have their interventions evaluated know their programme best of all, therefore are in the best position to describe succinctly what the programme consists of and how it should be implemented. They may also be in a position to describe the causal relationships between different elements of the programme and the key factors determining the impact of the intervention on key outcomes. In some cases, however, the independent evaluator may be better placed to determine the latter. We recommend, therefore, that developers preparing logic models for EEF projects focus on **inputs, activities, outputs and outcomes** from the list of components defined in section 4. Any suggested mediators and moderators would be very helpful, though not critical for the

³ Adapted from Funnell and Rogers (2011).

initial version. (Definitions, examples and guiding questions are provided for all these key components in section 4.) All the elements of the logic model will be collaboratively refined during the evaluation.

Once an independent evaluator has been appointed, they will work with the developer and EEF to determine the most appropriate evaluation design, including appropriate outcomes and, in particular, outcome measures (tests, data sources), using the logic model to support these decisions.

Table 1 provides an indication of the extent to which the developer and evaluator would normally be expected to contribute to the logic model (though this may, of course, vary from project to project). Likewise, not all projects will need multiple logic model revisions.

Table 1. *Responsibilities for drafting and refining the logic model* (highlighted in grey: developer focus at project approval stage)

Logic model components	Initial versions (Project approval, evaluation set up)		Refined versions (Evaluation protocol, report)	
	Developer	Evaluator	Developer	Evaluator
Inputs	✓✓	✓	✓	✓
Activities	✓✓	✓	✓	✓
Outputs	✓✓	✓	✓	✓
Short-term outcomes	✓✓	✓	✓	✓✓
Long-term outcomes	✓✓	✓	✓	✓✓
Mediators and causal mechanisms	✓	✓✓	✓	✓✓
Moderators and other contextual factors	✓	✓✓	✓	✓✓

Note: ✓✓ = leading ✓ = supporting

3) DEVELOPMENT PROCESS

We recommended the following process for developing logic models for EEF-funded evaluations:

1. **Project approval/ pre-approval:** the delivery team produce an initial logic model draft focusing on implementation, based on prior evidence and expected causal mechanisms. The EEF sends this to prospective evaluators who apply to evaluate the programme;

2. **Project set up:** once an evaluator is selected, the EEF will facilitate two set up meetings, and there will also be a collaborative workshop between the evaluator and developer where teams refine the logic model. The evaluation team revises this initial draft, adding the remaining components following set-up discussions with the delivery team and the EEF;
3. **Publishing the protocol:** the evaluator finalises the logic model and includes it in the evaluation protocol, a document that specifies the evaluation design, which will be informed by the logic model. This is published on the EEF website;
4. **Data analysis:** after data collection, the evaluator tests the logic model by conducting pre-specified quantitative and qualitative analyses to evaluate the programme theory, programme implementation and evaluation methodology;
5. **Data analysis:** the evaluator revises the logic model in line with the evidence;
6. **Reporting:** the evaluator includes both the initial logic model developed with the delivery team and the revised version based on data in the final evaluation report, describing the revision process and the extent to which the model was supported by the evidence.

4) CORE COMPONENTS

The EEF recommends a list of core components are included in the logic models drafted for the evaluations it funds. Other elements can be added, as needed, though good logic models are often relatively simple representations. Teams can use their own preferred format when drafting the model, as long as the key components and their relationships can be clearly understood by readers who are unfamiliar with the programme. A template is included in the appendix if developers would like to use this for the initial stage draft.

When trying to represent a complex intervention in a simplified form, it is often difficult to decide what the critical components are, and it can be hard to leave out elements that seem relevant. However, the 'story' behind a programme ('programme theory' or 'theory of change') is often quite simple. What can be difficult is pinpointing exactly *how* one element of the story leads to another. Independent evaluators will lead on clarifying this.

We recommend the following elements are included in EEF logic models. This corresponds with the IPE guidance for evaluators to ensure shared understanding, with further explanations and examples added. We also provide some guiding questions to help clarify each component. Not all guiding questions will be relevant to all projects, therefore they are not intended to elicit a set list of answers.

- a. **Inputs (resources):** the human, material, financial and other resources necessary for delivering the programme

These are the key resources without which the intervention would not be possible, and which may differentiate one programme from another. A CPD⁴ intervention, for example, could not take place without teachers, teacher trainers or training materials/ approaches. A computer-based intervention could not be implemented without computers or people to operate them. These would therefore be represented in the logic model as inputs. A balance would need to be struck between, on the one hand, depicting sufficient elements of the intervention to facilitate understanding, and, on the other hand, keeping the logic model relatively simple and clear.

Guiding questions:

- *Who are the key participants without whom the intervention could not be implemented?*
- *What key resources are needed to deliver the intervention?*
- *What are the key ingredients needed for the intervention to work as intended?*

- b. **Activities:** specific actions, processes or events through which the programme is delivered (the core intervention activities)

The key resources above will be used in particular activities or processes aiming to facilitate the desired outcomes. For example, CPD training would be provided to teachers, teachers would then deliver their lessons to pupils using the newly acquired approach, computer software would be demonstrated to teachers and then used with pupils etc. These would be summarised in the logic model under activities – again, focusing on what is absolutely necessary for the intervention to be understood by an external reader and capturing the key processes without which the intervention would lose its specificity. Intervention activities can occur at different levels – for instance, CPD training takes place at the teacher level, whereas the resulting teaching activities occur at the pupil level. Where an intervention is delivered through activities at different levels, this should be clearly captured in the logic model.

Guiding questions:

- *What key activities are involved in delivering and/ or receiving the intervention?*
- *What events are absolutely necessary for successful implementation?*
- *What key activities differentiate this programme from similar programmes or usual practice?*

⁴ continuous professional development (usually teacher training)

- c. **Outputs:** the number, size or scope of the activities, services or products delivered by the intervention to its participants

Like activities, these may often be described at the teacher and pupil level, depending on the particular programme. For example, a CPD intervention may consist of a specified number of sessions delivered to teachers and perhaps a specified number of lessons delivered by the trained teachers to their pupils. Schools may receive a set number of resource packs, at set intervals. Pupils may participate in specific activities for a specific length of time.

Guiding questions:

- *How many key activities, processes or events need to be completed for the intervention to be delivered as intended?*
- *What is the planned number or quantity of resources to be delivered as part of the intervention?*
- *What are the key quantifiable 'products' of the intervention activities?*
- *What needs to happen in order to know that the intervention was implemented as planned?*

- d. **Short-term outcomes:** specific changes in knowledge, skills, attitudes or behaviours experienced by individuals or groups in the short term as a result of programme outputs

These are the proximal outcomes that the intervention is aiming to improve within a relatively short period of time. For example, if an intervention is aiming to improve behaviour and attainment, behaviour improvements might be expected to become visible before attainment improves. In this case, behaviour would be a short-term outcome (specifically defined for the particular intervention). This will depend on each individual project, its theory of change and the length of time after which change can realistically be expected. Depending on the particular programme, short-term outcomes may be specified at the teacher level and/ or pupil level. An example of a teacher-level outcome would be maths teaching self-efficacy, which would be expected to increase the quality of maths teaching (which, in turn, would be expected to facilitate pupil maths attainment).

In some programmes, the short-term outcome may be expected to improve as a means of ultimately improving a longer-term outcome. (In the proverb example above, vitamin C intake would be expected to increase first and, through it, health benefits will follow in the longer term.) In such cases, the intermediate/ short-term outcome would be a mediator of the long-term outcome. For example, an intervention may be aiming to improve literacy attainment by increasing children's enjoyment of reading; their level of enjoyment would be expected to

increase in the short term before a longer term improvement in literacy. The causal link between the number of books read and (improved) literacy attainment would make the number of books read a mediator of literacy. (More on mediators below.)

Unintended short-term outcomes or consequences should also be anticipated and specified. It is important to consider early on whether the intervention might also lead to any unintended or negative consequences, so that these can be monitored or avoided⁵. For example, a programme that takes pupils out of literacy lessons in order to implement a new approach to studying maths may have the unintended consequence of negatively affecting literacy attainment. Such consequences may not always be apparent at the initial stage (indeed, not every programme will necessarily have unintended consequences). The evaluator will develop these further in collaboration with the developer.

While it can be difficult to specify a small number of outcomes to concentrate on, this difficulty can sometimes indicate that the programme theory has not been fully clarified. Reconsidering existing evidence (e.g., prior research) may help narrow down the list of possible outcomes. It is also important to consider what can realistically be included in a single evaluation with regards to cost and the research burden placed on schools, as well as other aspects of feasibility. (For example, multiple primary outcomes would normally require a much larger number of participating schools than just one primary outcome, with important implications on recruitment. For this reason, the EEF usually recommends just one primary outcome.)

Guiding questions:

- *What immediate changes are expected as a result of the intervention?*
- *What skills, knowledge, attitudes or behaviours is the intervention aiming to change in the short term?*
- *What proximal outcomes may be needed before we can detect a change in a more distal (long-term) outcome?*
- *Are there any short-term unintended consequences that may need to be monitored or avoided?*

e. **Long-term outcomes:** changes experienced by individuals, groups or organisations over time as a consequence of programme outputs

These would be outcomes that the intervention is expected to improve at a later stage (some time after the short-term outcomes). As with short-term outcomes, these will have to be

⁵ Of course, unintended positive consequences may also occur.

determined in line with the programme theory and the length of time after which change can be expected. They can also be defined at the teacher and/ or pupil level, depending on the particular programme. In an EEF evaluation, the pupil level long-term outcome is typically the primary outcome captured in the evaluation, though this may differ depending on the programme (e.g., the short-term outcome may be the primary outcome). Some interventions may not be designed to influence long-term outcomes⁶. Any unintended long-term outcomes or consequences should be specified as well.

Guiding questions:

- *What later changes are expected as a result of the intervention?*
 - *What skills, knowledge, attitudes or behaviours is the intervention aiming to change in the long term?*
 - *What is a key problem that the intervention is aiming to address? (What would improve as a result of the intervention?)*
 - *Are there any long-term unintended consequences that may need to be monitored or avoided?*
- f. **Mediators and causal mechanisms.** Mediators are intermediate variables in a causal sequence from intervention to outcome (intervention X causes mediator Z, mediator Z causes outcome Y).

An example could be a mentoring programme (X) that aims to increase student attainment (Y) by increasing student attendance (Z). Or a parenting intervention (X) aiming to increase pupil literacy (Y) by enhancing parental literacy awareness (Z). Mediators help answer the question: **How does the intervention work?** Together with the causal mechanisms or processes, they represent the programme theory. In EEF trials, they are often defined as secondary outcomes. Short-term outcomes can also be mediators for long-term outcomes, in programmes where the short-term outcome must be achieved in order to trigger the long-term outcome.

Defining mediators can be difficult if the programme theory is based on assumptions that have not necessarily been examined in detail. For instance, some interventions aim to improve pupil motivation, *assuming* that improved motivation will lead to improved learning, which in turn is *assumed* to improve attainment. However, the causal chain between these outcomes is not always clear. (Why do we assume that improved motivation will lead to improved learning? What

⁶ Though please note the EEF now plans longitudinal follow-ups for all its trials. More details [here](#).

evidence is there beyond mere correlation⁷? How does improved motivation lead to improved learning? What kind of learning will be improved by improving motivation? How will that improved learning lead to better attainment? How can we measure motivation in a way that reliably indicates learning is taking place?⁸)

It may not always be possible to tease out all these causal links at project approval stage. Independent evaluators will lead on finalising mediators and causal mechanisms during the evaluation. However, any suggestions developers can make in this respect will help attract stronger evaluation proposals and shape rigorous evaluation designs.

Guiding questions:

- *How does the intervention work? (How do we know?)*
 - *Why does the intervention work? (How do we know?)*
 - *What are the key mechanisms that trigger the desired change?*
 - *If we expect action A to lead to outcome B, what evidence is this expectation based on? How do we know that A and B are in a cause-effect relationship? Could there be any factors mediating this relationship?*
 - *If the evaluation were to find a null effect⁹ or negative effect¹⁰, what could explain this?*
- g. **Moderators and other contextual factors.** Moderators are variables that modify the form or strength of the relation between intervention and outcome (e.g., may support or impede the successful implementation of the intervention).

Any key factors expected to influence the success of the intervention or the magnitude of the impact would be listed here. These may include any individual characteristics (e.g., gender, age, socio-economic status¹¹, disability), institution characteristics (e.g., school type, geographic location, Ofsted rating) or baseline measures that may result in differential impact on different types or sub-groups of participants. Moderators may also be various contextual factors (e.g., workload, unconscious bias, supportive leadership) or implementation dimensions such as

⁷ Brief explanation of the difference between correlation and causation:
<https://towardsdatascience.com/correlation-does-not-imply-causation-92e4832a6713>

⁸ Selecting a valid outcome measure is also critical – and particularly difficult for motivation. (A pupil who *looks* motivated or engaged is not necessarily a pupil who is learning, and vice versa.)

⁹ No difference between the intervention and the control groups.

¹⁰ The control group (usual practice) performed better than the intervention group.

¹¹ Sub-group analyses by FSM status (eligibility for free school meals) are included in EEF evaluations as standard due to EEF's mission to help reduce the attainment gap for disadvantaged pupils.

fidelity, quality of delivery, adaptation or participant responsiveness. Moderators help answer the question: ***For whom does the intervention work and under what circumstances?***

As with all the other logic model components, there needs to be a clear rationale based on prior evidence for including a particular expected moderator in the logic model. Teams sometimes include assumed moderators such as gender or EAL status because *it would be interesting* to see if the intervention has a different impact on relevant sub-groups of participants. However, if prior research or other types of robust evidence do not clearly indicate a difference can be expected, including such elements in the evaluation is not advisable. (If particular elements are included in the logic model for background but not expected to be included in the evaluation itself, this should be clarified.)

Guiding questions:

- *Is the programme expected to have a different impact for different groups of participants?*
- *Are different groups expected to respond to the programme differently?*
- *What are the key contextual factors needed for the intervention to be successfully implemented?*
- *What are the key contextual factors needed for the intervention to have the desired impact?*
- *What key factors could enhance or hinder the effect of the intervention?*
- *If the intervention were to be unsuccessful, what might be the key contextual reasons?*

APPENDIX: LOGIC MODEL TEMPLATE FOR DEVELOPERS

Optional template for developers to use for the initial logic model draft.

Inputs (resources): the human, material, financial and other resources necessary for delivering the programme.



Activities: specific actions, processes or events through which the programme is delivered. This typically describes the core intervention activities that are delivered, and may be at teacher level (activities delivered to teachers) and/ or pupil level (activities delivered to pupils).



Outputs: the number, size or scope of the activities, services or products delivered by the intervention to its participants. These may be at the teacher level and/ or pupil level.



Short term outcomes: specific changes in knowledge, skills, attitudes or behaviours experienced by individuals or groups in the short term as a result of programme outputs. Note that these may be mediators (the intermediate outcomes expected to change before the longer-term outcome changes). These may be at the teacher level and/ or pupil level.



Long term outcomes: changes experienced over time as a consequence of programme outputs. These may be at the teacher level and/ or pupil level, though the EEF would typically measure pupil level long term outcomes.

Optional at this stage: Please note here any **moderators** (contextual factors expected to influence the success of the intervention or the magnitude of the impact)

FURTHER RESOURCES

- Education Endowment Foundation. (2019). [Implementation and process evaluation guidance for EEF evaluations](#). London: Author.
- Funnell, S. C., & Rogers, P. J. (2011). *Purposeful program theory: Effective use of theories of change and logic models*. San Francisco, CA: Wiley.
- Humphrey, N., Lendrum, A., Ashworth, E., Frearson, K., Buck, R., & Kerr, K. (2016). [Implementation and process evaluation \(IPE\) for interventions in education settings: An introductory handbook](#). London: Education Endowment Foundation.
- Humphrey, N., Lendrum, A., Ashworth, E., Frearson, K., Buck, R., & Kerr, K. (2016). [Implementation and process evaluation \(IPE\) for interventions in education settings: A synthesis of the literature](#). London: Education Endowment Foundation.
- Knowlton, L. W., & Phillips, C. C. (2012). *The logic model guidebook: Better strategies for great results* (2nd ed.). Los Angeles: Sage.