Evidence-Based EdTech Diagnostic

EDUCATE Programme: Research Materials

Tips for Choosing your Research Question

*To find out how **you** can benefit from examining your EdTech through a **'research and evidence mindset',** contact our **Accelerator Team** at hello@educateventures.com*

Relevance

1. Research questions can be either exploratory or affirmatory in nature. Ask yourself first: are you trying to prove or demonstrate something that you have hypothesized about? Or are you searching for possible directions and do not have an initial idea of what the answer should be?
2. The question could address an issue that you need the answer to in order to progress. For instance, if you have a prototype or an MVP, before scaling up, you should probably answer some questions about its usability and how it is received by members of the target audience
3. The question could approach something that concerns some of the stakeholders. For instance, schools might be wondering which grades your product is most suitable for? Investors may be wondering whether a product or service that was received well in one country or community will be received in the same manner in another country or by members of a different culture. Parents might be asking questions like how will doing this affect our children in different settings? Using research, you could provide knowledgeable answers to these questions, supported by evidence. Use the opportunity to devise the right questions
4. Level of focus: research questions can be broad, or they can be very precise. Generally, if you have a broad question, you should break it down into several more focused questions to answer separately based on evidence, and then use this evidence to form insight and construct a broader understanding. Questions that are too focused would not be very interesting – remember, the idea of research is to be able to say something of value about the world

Tips for Choosing your Research Question

Feasibility & Practicality

5. Your question must be in line with the state of your product. If you're just starting out, you will not be able to answer questions that require a large set of participants such as effectiveness questions. You could, however, ask questions about the reactions to your prototype, or even more exploratory questions about the need for your product

6. Questions about causality such as 'Does using our product increase school attainment?' require some form of comparison. The most basic form is a longitudinal study – measuring at different times before and after engaging with the product. An experimental setting of comparing to a designated control group provides an even more apt basis for comparison and for establishing causality. Another option is a quasi-experimental setting, in which a comparison is constructed based on existing groups that had different access to the product but are otherwise similar. Questions about correlations, such as 'Is using our product associated with increased learning achievements?' are less demanding because they do not require establishing that the product is the soul or the main cause of the change. For the same reason, they are less convincing. They are, however, useful for an initial validation of product's possible effects

7. Quantitatively phrased questions require using quantitative research methods, which require a sufficient number of participants. Exactly how many participants varies according to the context, but as a rule of thumb, with less than 30 respondents you preferably should not use statistical methods at all. If you do not have access to this many people and cannot develop such access – it would be best to stick to qualitative questions

8. Performance vs. perceptions: When phrasing the question, make sure that you can measure the construct that you are asking about. If you can measure changes in knowledge, skills or behaviour, you can form a question on those constructs. However, if you can only measure perceptions of change, for instance by asking users if they feel they have undergone change – then make sure your question is phrased as a perception question - 'Do users feel that using the product was beneficial to them?

Research Questions, the Theory of Change, and the Logic Model

- Often, research is used to validate a product's Theory of Change, or latent theory of your product. This is the idea that connects the need or gap that your product was created to bridge with what the end result of using your product should be, and the ways in which the product could support the achievement of that result

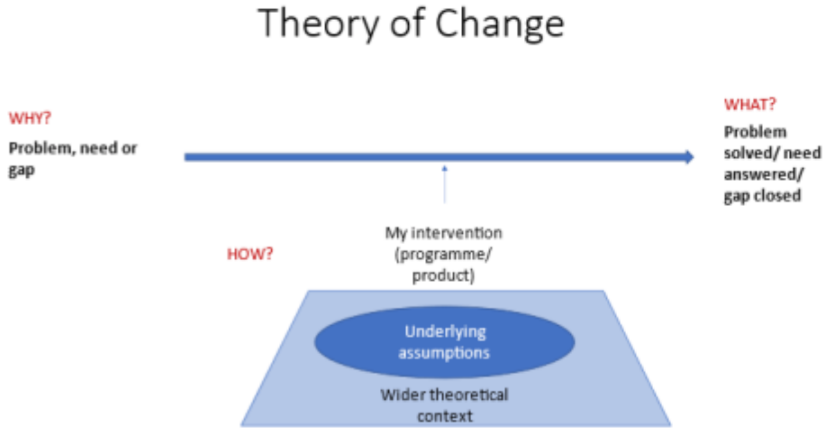
The research question can address any step along that journey:

- If you are still in the stage of validating that the need or gap that you've pointed to exists to make your case to stakeholders (including yourself) - phrase a question directed at establishing that need. Examples: 'What kinds of difficulties do international university applicants experience?', 'What are some of the barriers that prevent girls from using online games that promote the development of programming skills?'

- If you are running a small-scale pilot - phrase questions about usage of your product and about its perceived effects and possible value in bridging over the gap or need. Examples: 'How do teachers integrate using the product in their curriculum?', 'Did parents experimenting with the service feel more confident about their ability to create a healthy daily routine for their baby?' or 'Were there differences in the attitudes towards the service between first time parents and veteran parents?'

- In a larger-scale pilot or after launching the product for initial commercial use – phrase questions about ongoing use by monitoring outputs or about effectiveness by measuring the outcomes you have defined. Examples: 'What are the factors affecting the duration and the frequency of using the app?', 'Is there a correlation between using the app and increased math grades?'

The Theory of Change is the idea that connects the need or gap that your product was created to bridge with what the end result of using your product should be, and the ways in which the product could support the achievement of that result



Research Question to Research Design

Theory of change component	Exploratory		Affirmatory	
Problem, need or gap	Identifying the problem, need or gap	- Literature reviews - expert interviews - Interviews with or observations of members of target audience - Open ended questions surveys - Multiple choice questions, comparative rating questions	Validating the problem, need or gap	-Surveying the users pre-experience with product -Testing the users' skills or knowledge pre-experience with product
Intervention	Recognizing unintended or unexpected uses, barriers or facilitators of use	- Observations (inc. Data logs) - interviews -open ended survey questions	monitoring outputs	-Monitoring use via logs -Information about outputs that cannot be extracted via logs should be gathered using other methods
Outcomes	Understanding individual experience of change	-Narratives and themes based on interviews and reflections on personal experience by users of distinct types (e.g. students, teachers, parents)	Intervention effectiveness assessment	-Measuring change in knowledge, skills, qualities, and attitudes -Using comparisons (before-after, between groups) if applicable, or -self-evaluation of change,
Impacts	Establishing theoretical basis for claimed impacts and their relations to outcomes	-Literature reviews -Expert opinions	Assessing impacts	- Longitudinal research - External measures

Evidence in EdTech

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- Evidence of the **impact** of EdTech on teaching and learning is often at the forefront of **demands,** particularly from those who dictate the **funding** available to pay for technology within education. As has been shown in numerous **meta-level investigations,** (see for instance Cox et al., 2003), evaluation of the impact is a **challenge.** This is magnified when evaluating **emerging innovative technologies**
- **Pedagogical change** is at the core of these technologies, both because their design evolves over **time,** but also, arguably, their raison d'être is to **transform the learners' experience** (Cukurova & Luckin, 2018)
- The increased challenge is at least partially due to the **unwritten expectation** that, in traditional impact evaluations, evidence regarding the impact of an intervention is considered as a **shield against change.** The generation of **scientifically robust evidence** can be used by stakeholders, such as policymakers, for an educational intervention's **standardisation** and **scaling**
- **Change** is the essence of emerging technologies, though. Three years after an original report reviewing emerging technology innovations in education (Luckin et al., 2012), there was evidence that only **39 of the 150 innovations** (26%) were still in active use. Therefore, in the context of emerging technologies, more **value** is to be found in the careful consideration of different **types** and **sources** of evidence that are appropriate to the **current state of the technology** as well as in the use of **robust research methods** to generate **new evidence**
- This requires an **evidence-informed decision-making process** for the **design and use of EdTech,** rather than only considering evidence as the **outcome of the evaluation**
- Taking into account the peculiarities of the **local context,** the accumulated experience and judgment of **educators,** and the perspectives and values of **users,** and combining these three with the fourth source, **the best available research evidence,** can provide a more productive way forward in the attempt to bring evidence into **educational practice**

- Excerpt from 'Evidence & the Golden Triangle of EdTech, (EDUCATE, 2021)' by Professors Cukurova, Luckin, Clark-Wilson

Who can help me?

*We are specialists in **educational research** and **evidence-based technological development** for schools and education and training businesses*

The EDUCATE Programme promotes **excellence** in the EdTech community by providing **training** and **mentoring** to support and promote the use of **evidence-informed EdTech.** Our research-focussed programme, based on the **Golden Triangle,** bridges the gaps between **EdTech designers** and **developers, researchers in education and EdTech,** and **users,** to ensure that EdTech products live up to their **promises.**

To find out how you can benefit from examining your school or business through a **'research and evidence mindset',** and focussing on **'what works',** contact the **Accelerator Team** at EDUCATE Ventures Research today:
hello@educateventures.com

Thanks for reading!

- The EDUCATE Ventures Research Team

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