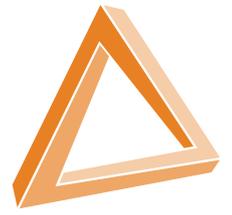


# Evidence-Based EdTech Diagnostic



## EDUCATE Programme: Research Materials



EDTECH  
COMPANIES

### Sampling and Generalisability

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](mailto:hello@educateventures.com)

#### Going Beyond the Data We've Collected

- The goal of any quantitative research is to **generalise** from the research findings to some other population. This can be from the pilot population to the population of future users, from a small subset of users to the entire population of users, etc.
- The key to this is making sure that the population studied does not vary systematically from the population generalised to. While people and contexts are never the same, different subsets of the population can be similar enough, or at least different in ways that do not have a major impact on the intervention's effect



# Going Beyond the Data We've Collected

- When designing a study, one of the first steps is **identifying the target population** which we want to generalise to. This includes:
  - Population frame: what are the boundaries of the target population?
    - Example: Students in grades 1-4; International university applicants; Teachers of English as a second language; Parents of children with autism
  - Key properties of mainstream “prototypical” population
    - Example: Demographics such as gender (if relevant), age, nationality or social culture; Relevant skills like technological proficiency, language, existing qualifications
  - Special groups within the population
    - Example: Recognisable smaller groups within the target

population that fall within the boundaries of the defined target population but differ systematically in aspects from its mainstream, in manners that might affect their outcomes from interaction with the product/service

## Expert's Tip!

- **Our study population should be as similar as possible to our target population. However, this is not always possible. Good practice is to identify differences that be potential caveats and speculate how this might result in different outcomes. These should be pointed out as study limitations, and as directions to pursue in the future, when access to more diverse users is possible. Sometimes this can be bridged over-using statistical methods, but these would still require a minimal number of representatives of the under-represented group within the studied subset**

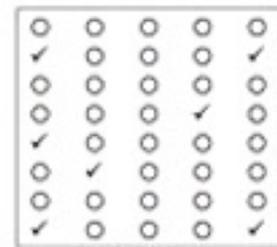
## Statistical Sampling

- In the world of EdTech, a major part of our data usually comes from backend logs. Other quantitative data might come from surveys or assessments that we run within our platforms. In the former case, the logs would include the data for all the participants. In the latter case, it would include data from anyone who took the survey or test and agreed to share it. In both cases, being already in a digitized format, there virtually are no limitations on the amount of data that can be collected and used for analysis, so statistical sampling is obsolete. The questions about the representativeness of the sample would typically be addressed at analysis rather than at the point of planning the data collection
- Still, in some cases, we may not have the capacity or the resources to include the entire existing population of users within our quantitative study design. For instance, if some of our data is collected as qualitative (open ended survey questions) and then quantified using manual coding, or if while conducting preliminary research and actively approaching potential users or stakeholders. Probability methods are also relevant for controlled trials and for A/B testing
- Some methods for statistical sampling are below

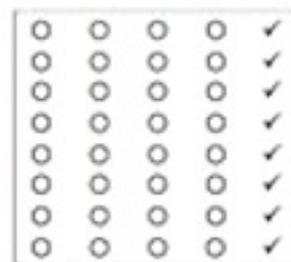
### Random/Probability Sampling

- Regular Random Sampling
  - In regular random sampling, entire population-frame is pooled, and each member has an equal chance of entering the sample. This method can be used when there are no systematic biases in the population, for instance in regards to cooperating with the research. The method

is not suit for diverse populations with groups that are vastly different in size, as some of the smaller groups are likely to not be represented at all



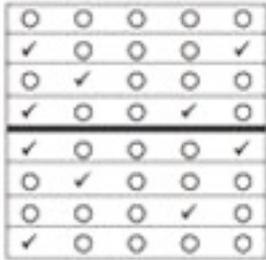
- Systematic Sampling
  - In this method, some systematic mechanism for entering the sample is established. As long as this mechanism is not somehow correlated with systematic differences, the subjects or observations chosen can represent the population from because it is equivalent to random sampling. However, do not use this method if it creates a bias. For instance, if every 10th subject is interviewed, and the workday consists of 10 slots, then only participants from afternoon sessions would be interviewed



# Statistical Sampling, continued

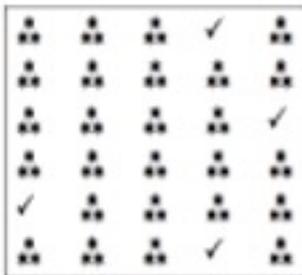
## • Stratified Sampling

- Stratified sampling should be used if your population framed is composed of differentiated strata that are either receiving a different treatment or are expected to achieve different outcomes. To make sure that these are represented, the randomized pooling is done separately for each stratum. An example of strata are grade levels or countries of origin



## • Cluster Sampling

- In cluster sampling, entire groups of subjects that belong to organizational units are pooled together. This method is compatible when the population frame is organized in a fashion that facilitates approaching an entire unit, and when these units are internally heterogeneous. Often, this method is applied in combination with stratified sampling, for example pooling entire homeroom classes from each grade level in a school, or pooling one/several schools from each district



## Non-random Sampling

- Often, you may not have access to the entire population-frame to pool from, or not have the means to make sure that representatives of specific groups become included in the sample, for instance if there is a small number of them to begin with, and the possibility of getting a random representative to participate is unlikely
- In these cases, you may have to rely on different methods:
  - Handpicked sampling - Approaching specific representatives of the targeted population
  - Snowball sampling - Getting some member(s) of the target population to participate in the research and pass the word on to their friends, acquaintances, or followers, either through social media or from other contexts
  - Volunteer sampling - Participation in your research can be promoted through social media or other means. Usually this entails offering some sort of compensation for participating
- While all these methods may bias results, they are all acceptable if the limitations for generalization are acknowledged



# Evidence in EdTech

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](mailto:hello@educateventures.com)

- 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](mailto:hello@educateventures.com)

Thanks for reading!

- The EDUCATE Ventures Research Team  
Summer 2022

