5. METHODOLOGIES

SELECTING A DESIGN

Before you decide on the most appropriate evaluation design, it is important that you are clear about the primary evaluation questions. Once you have defined the most important evaluation questions, there are several designs that may adequately answer them. You can select a specific design by considering the following:

- **Which design will provide me with the information I want?**
- **How feasible is each option?**
- **How valid and reliable do my findings need to be?**
- **Are there any ethical concerns related to choosing a specific design?**
- **How much would each option cost?**

EXPERIMENTAL AND QUASI-EXPERIMENTAL DESIGNS

How you operate your programme will be influenced by how you plan to evaluate it. If you use an experimental or quasi-experimental design, summative and impact evaluation will be more straightforward because, in effect, you will be operating and evaluating the programme at the same time.

Experimental designs:

The best designs for impact and outcome evaluation are experimental designs. Evaluation with an experimental design produces the strongest evidence that a programme contributed to a change in the knowledge, attitudes, beliefs, or behaviors of the target population.

The key factor in experimental design is randomization: evaluation participants are randomly assigned to one of two or more groups. One or more groups will receive an intervention, and the other group(s) will receive either no intervention or a placebo. The effects of the programme are measured by comparing the changes in the various groups' knowledge, attitudes, beliefs, or behaviors.

Randomisation ensures that the various groups are as similar as possible, thus allowing evaluators to eliminate factors outside the programme as reasons for changes.

Difficulties with experimental designs:

Although experimental designs are ideal for programme evaluation, they are often difficult to set up. The difficulty may be due to logistical problems or budgetary limitations.

Quasi-experimental designs:

Because of the difficulties with experimental designs, programmes sometimes use quasi-experimental designs. Such designs do not require that participants be randomly assigned to one or another group. Instead, the evaluator selects a whole group (e.g., a third class in one school) to receive a STEM education programme and another group (e.g., a third class in a different school) as the comparison or control group.

As an alternative, if a suitable comparison group cannot be found, the evaluator could take multiple measurements of the intervention group before providing the intervention.

When using quasi-experimental designs with comparison groups, evaluators must take extra care to ensure that the intervention group is similar to the comparison group, and they must be able to describe the ways in which the groups are not similar.

EXAMPLE OF AN EXPERIMENTAL DESIGN

Pretest-posttest-control group design: Scientists often call this design a true experiment or a clinical trial. These are the steps involved:

1. **Recruit people for the evaluation.**
2. **Randomly assign each person to one of two groups: one group will receive the intervention and the other will not. To select at random, use a computer-generated list of random numbers, a table of random numbers (found at the back of most books on basic statistics), or the toss of a coin.**
3. **Observe (measure) each group's knowledge, attitudes, behaviors, or any other characteristics of interest.**
4. **Provide the programme to one group and no programme to the other group.**
5. **Again, observe (measure) each group's knowledge, attitudes, behaviors, or whatever other characteristic you measured before providing the programme.**