

Questions and answers for Chapter 2

1. What are the main differences between experimental and quasi-experimental studies?

The main distinction between experimental and quasi-experimental research lies in the allocation of persons to groups. In traditional experimental research persons are allocated to groups through randomisation, to minimise bias. Quasi-experiments are often used precisely because such random allocation is not possible or practical. Typically, the experimental group will be decided by which settings (e.g. schools/classrooms/factories) have volunteered or been selected to be part of the intervention. Therefore, rather than randomly allocating, we will have to choose a control group that is as similar to the experimental group as possible. Because we are not using random allocation, we call this control group the comparison group, as it is not a pure control group. This means that there is a greater likelihood of bias in quasi-experimental research.

2. 'Correlation does not imply causality'. Do you agree with this statement? Why? Why not?

Correlation only demonstrates one of the three conditions for causality – the fact that there is a relationship between two variables, a and b. It does not indicate a time sequence, so doesn't tell us whether a came before b in time. It also doesn't tell us whether the relationship might have been caused by a third underlying variable, c.

3. If experiments are the best way of determining causality, why would we want to do any other kind of research?

Not all research questions lend themselves to experiments. By definition, experiments are most useful for studying relatively limited research questions. A question like 'what is the relationship between media use, self-concept, school achievement and peer relations' would, for example, be rather too complex to study experimentally. It can also be practically difficult to set up an experiment in an educational setting. Another problem is that we can't be sure that what we find in a laboratory setting will translate to a real educational context.

4. I want to know whether my school improvement project is improving pupils' attitudes to school. Can you design a study that looks at this?

This question would lend itself to a quasi-experimental design. What we could do is select one or more schools similar to the ones we are doing the project in to act as comparison schools. We could then survey pupils in both schools before the start of the project and at the end of the year. We could then compare the attitudes and any changes in attitudes between the programme and the comparison schools, controlling statistically for other relevant variables like pupil background.

5. I have noticed that my pupils seem to be hyperactive when they have drunk soft drinks

during break time. I want to know whether consuming soft drinks leads to lower concentration levels in pupils immediately following consumption. Can you design a study that looks at this?

This question would lend itself to an experimental study. We could randomly assign a group of pupils to an experimental and control condition. We could then design or buy a test of concentration, and administer that to all pupils before the experiment. The experimental group could then consume a soft drink, the control group might be given a different drink, for example fruit juice. We could then administer the test again, so we have a pre-post test design. This will allow us to both compare the results before and after consumption of the soft drink, and between experimental and control group. Of course, we would have to consider carefully what dosage of soft drink we would consider large enough to have an impact.

6. I want to know whether teacher motivation improves pupil performance, or whether it is higher pupil performance that motivates teachers. Is it possible to determine this? If yes, how would you do that?

This is a classic cause and effect question, and quite difficult to determine. Remember, three things need to be true to determine cause and effect: a relationship, a time order and the assurance that the relationship has not been caused by an underlying variable we haven't measured. Both teacher motivation and pupil performance are easily measurable through tests and surveys, so the first condition, a relationship, is easily establishable.

That is not the case for the other two factors. To determine whether another variable might be the cause of the relationship we would have to either collect data on all possible confounding variables, which would be exceptionally difficult, or conduct an experimental study. To determine time sequence it would again be best to conduct an experimental study, or else study the phenomenon over a longish time period so we can measure change. To conduct an experiment, (the best option in terms of determining causality), would be difficult, as we would somehow need to manipulate teacher motivation or pupil achievement. Not only would this be hard to do, but there would be some clear ethical difficulties in doing this.