



STAGE 1 AND 2 PSYCHOLOGY

TEACHING AND LEARNING STRATEGIES

The purpose of this document is to explain to teachers how students could be assisted in developing a proposal to carry out a collaborative or an individual investigation after the class has conducted a SACE Board approved research program.

PROPOSAL DEVELOPMENT

The Nature of the Research Program Data

In all research programs, data is either statistical or verbal in nature. It is either a set of 'raw' scores (e.g. a column of students' questionnaire scores), or notes and verbal responses (e.g. a collection of opinions and statements made by students during a focus group session). Usually, raw scores for the various groups and sub-groups are totalled and mean scores and/or standard deviations etc. are calculated. Instructions for these procedures are given in the research programs in the **DATA PROCESSING** section, or as Notes at the bottom of the Summary sheets in the **MATERIALS** section. Written material has to be categorised and analysed. (See "How to Conduct a Focus Group" and "How to conduct a study using the Delphi technique" on the SACE website.)

Teachers will appreciate that the data generated in the research programs is, to a lesser or greater extent, 'contrived'. While it is not 'made-up', it is somewhat artificial or not as accurate as it could be (i.e. it might not be valid). It is a general truth in science that quantitative data (statistics) and qualitative data (text) about humans may not be valid simply as a result of the procedures used to collect that data. For example, ethical considerations must take precedence over the intentions of the researcher, regardless of the fact that the outcome of the study may be a distortion of what might ordinarily have been found had the ethical adjustment not been implemented. The validity of the data is never more important than the welfare of the participants.

Also, a properly conducted psychological study would require more stringent controls over data collection than are often used in the research programs. For example, when dealing with human populations, a major requirement of data collection (i.e. sampling or surveying) is that it be collected randomly so that the sample itself can be regarded as a true and accurate cross-section of the population. In the case of the research programs, any inferences made from the data gathered by students about students, or about friends or relatives of students, should be (i) viewed with caution, and (ii) not necessarily directed at the general population.

Gathering the Data

In spite of the above limitations, every effort has been made by the writers to ensure that the data *can be* gathered in a scientific way. To *actually* gather the data in the conventional scientific way, teachers and students should make every effort to comply with the procedures and not modify them.

Proposal Development and Use of the Data

Once the data has been collected, and students are ready to develop their proposals, teachers are advised to refer back to the instructions stipulated in the Psychology Subject Outline. Proposals, whether individual or collaborative, must be developed *first*, and *then* the data can be analysed. This procedure approximates scientific convention where hypotheses are formed *before* the data is collected and analysed.

Part of the development of the proposal requires the formulation of questions. There are two main sections in the research programs that teachers can use to guide students through this process. First, suggestions of possible questions are given in Table 1 (see page 3 of every research program, just after the **OVERVIEW**). This table gives examples of comparisons and relationships that can be analysed in order to answer various questions. Second, teachers should refer to the **INVESTIGATION DESIGN** sections of the research programs. This section (i) describes the various components of the research program, (ii) refers to the data related to those components, and (iii) gives examples of how a question might be formed and then answered, using that data.



While these sections are not exhaustive, the teacher should use them as aids in assisting students in the formulation of their questions. Even so, teachers might find that the above sections are not sufficient to guide students. Teachers may need to refer to the actual data, but this is to be done with caution. At no time should teachers hand out the results (i.e. completed Summaries) to the students before questions are formed. Teachers may show the students blank copies of the Summaries to give them an idea of how the data will be represented. However, if students are permitted to see the actual data in advance, they will be able to determine the outcome of the study, and they will be able to formulate post hoc questions on the basis of prior knowledge about the data—that would defeat the purpose of the investigation. Students must be made aware that it is not good science to see the results of a study first and then pose a question to which they already know the answer. That would be the same as seeing the answers to the questions in an examination before they sit the examination.

Students have to be prepared to meet the challenge of an unpredictable outcome, and interpret and evaluate that outcome, whether it is favourable or not. A student who poses a post hoc question has an unfair advantage as there would be no need to explain a failed result, nor critique the design of the research program. The student could not indicate flaws, if any, in the design, or the theory underlying the design, because the successful result would not necessarily warrant that kind of consideration. Nor would a student feel a need to recommend modifications to the methodology, other than suggest improvements that might elicit an even stronger effect. Teachers should note that the quality of a written report may suffer if questions are post hoc and are highly likely to be answered in the affirmative.

Question or Hypothesis—What's the Difference?

SACE approved Research Programs are designed in such a way that a considerable amount of data will be generated. This way, opportunity is given to students to formulate a diverse range of questions, which are to be answered in their individual and collaborative investigations (i.e. reports). A question might take the form "Does heart-rate increase after watching a violent video?" Although the word 'question' is used throughout both the Curriculum Statement and the research programs, the word itself merely 'suggests' that students should form a question—it is not to be taken literally.

In psychology (as in science generally), a researcher usually proposes a 'hypothesis', which takes the form of a statement (e.g. "Heart-rate increases after watching a violent video"). Hypotheses are always about the population that is being sampled. Analysis of the data is conducted in order to find out whether there is support for the hypothesis. It is up to the student whether to ask a 'question' or propose a 'hypothesis'. Either way, the data generated by the research program must be analysed in order to 'answer the question', or 'find support for the hypothesis'.