TOPIC 1 INTRODUCTION

Worksheet 1 Research in Psychology

INVESTIGATION DESIGNS	**link with arrows**	Descriptions
1. Experimental		**A** Observe and measure the result of natural variations in a variable: eg, whether our level of concentration varies at different times of the day at school
2. Quantitative Observational		**B** Usually in the form of a discussion, where pre-determined issues and criteria are considered: eg, when do you think you do your best work at school?
3. Qualitative		**C** One variable is manipulated, and the effect of this is measured: eg, whether we would work better in class if required to sit alone rather than with friends

METHODS OF ASSESSING RESPONSES	**link with arrows**	Descriptions
1. Objective quantitative		**A** Numerical measurement that is based on opinion or personal input – such as self-reports (questionnaire on moods, for example), rating scales, checklists
2. Subjective quantitative		**B** Numerical measurement that does not involve opinion – such as reaction time, blood pressure, score on a test, count from a discussion group, behaviour count
3. Qualitative		**C** Verbal data (non-numerical) – such as self-reports (questionnaires, checklists), interviews, focus group records, Delphi technique records

In the table below it may seem that the ideas could be arranged in more than one way. For example, it would appear to be possible for either of the two 'effects of sleep deprivation' studies to be done as an *experimental* or as a *quantitative observational* investigation. However, for ethical reasons we could not do the *major road accidents* study as an experiment as we would be harming people, but we could set up an experiment to investigate the *skill levels of trainee pilots* since this involves the use of a training machine and not real planes.

DESIGNS ➔	Experimental	Quantitative observational	Qualitative
DATA ➓	***Effects of sleep deprivation on skill levels of trainee pilots.***	***Effects of sleep deprivation in major road accidents.***	***The importance of sleep (Delphi technique)***
Objective quantitative	Deprive of sleep for various times – record skill levels on training machine.	Record the number of hours of sleep in the 24/48 hours before the accident.	Count number of different reasons listed, and identify the % referring to sleep.
Subjective quantitative	Rate alertness and other factors as compared to normal.	Rate alertness or tiredness in the moments before the accident.	Vote to rate the different identified reasons why sleep matters.
Qualitative	Describe performance on skill test – skills, control, feelings, etc.	Describe the recollection of events leading up to the accident.	Analysis of common themes from different groups.

The answers below illustrate one way this question could be answered. Many others are possible, and a very good way to check this question would be to compare your answers with those from one or two others and each justify your answers.

DESIGNS ➔	Experimental	Quantitative observational	Qualitative
DATA ➓	***Two classes (same school, same teacher): one class uses workbook, the other does not.***	***Compare students who choose to use workbook with students who choose not to.***	***Discussion among students of the value of using the workbook.***
Objective quantitative		Record final mark for psychology for all students involved, and compare groups.	
Subjective quantitative	Survey students from both classes on aspects such as how well they felt they understood the work, how confident they were about the exam, etc.		
Qualitative			Lists of students' perceptions of the value of using the workbook, grouped into positives and negatives.

Worksheet 2 Investigation Designs

Experimental Investigation

(These answers refer to the three designs set out in the previous table. Your answers will depend on the ideas you put in your table.)

Participants: Who will be the participants? How many?
This depends on how many students in the classes involved. To obtain reliable results, this investigation would be conducted across several schools in which two such classes could be set up (one with the workbook, one without).

Groups: How will you allocate participants to the experimental and control groups?
The school or teacher would make this decision, and students in the two classes would be told whether they were using the workbook or not.

Pre-Testing: Will you need to pre-test the participants (necessary sometimes to determine how much change occurs during the 'treatment' phase)?
Ideally the students should be pre-tested (see 'data' below), however if large numbers are involved and the allocation to groups is random the students' abilities can be assumed to be similar in the two groups.

Treatment: What happens during the experiment? What is the 'treatment' you are trying to measure the effect of? How is it to be done? For how long?
The 'treatment' is the use or non-use of the workbook. This would continue for the full school year, the teacher using it as part of their teaching of the psychology course.

Controls: Which variables will you need to control? How will you do this?
Students in the two groups need to have identical conditions except for the workbook – same teacher, same number in the class, same classroom, same learning experiences apart from the workbook (the teacher could not, for example, substitute for the workbook in the control group with extra videos or discussions that the experimental group did not have).

Data: What data do you plan to collect?
The data type selected for this investigation was *subjective quantitative*. Students in each group (experimental, control) will be surveyed at four times through the year: start of term 1, end of terms 1, 2 and 3. At each time they will be asked to report on their understanding of the work they have done, their confidence in handling assessment tasks such as assignments and exams, and how well they believe they will do in the final assessment for this subject.

Other comments
There are serious ethical issues here. Are we disadvantaging either group of students? Should they have been given a choice? Would the experiment still be valid if we did? These issues will be addressed in worksheet 5.

Quantitative Observational Investigation

Participants: Who will you include as the participants for the investigation? How many?
All stage 2 Psychology students in any school can be involved, and it is important to include enough schools to have reasonable numbers who are using the workbook and who are not.

Pre-Testing: Will you need to pre-test the participants?

Ideally the students should be pre-tested, however if large numbers are involved the students' abilities can be assumed to be similar.

Method: What will you do during the investigation? What will you be observing? What would be the length of observation period?

All that needs to be monitored during the year is the extent to which each student uses the workbook. As they are not in different groups (such as classes or schools), we do not need to monitor whether other variables are kept constant.

Data: What data do you plan to collect? (Again this will depend on what you indicated in Worksheet 1.) Remember you need to measure both variables.

Objective quantitative data: The simplest way to do this would be to record two things for each student: how extensively he/she used the workbook through the year (as a %), and the final SSABSA mark for psychology (the mark out of 20).

Qualitative Investigation

Participants: Who will your participants be? How many?

Stage 2 psychology students from a range of schools where the workbook is used. All students at those schools who used the workbook are involved (if participation is optional it produces a biased sample and unreliable results).

Method: What will you do during the investigation? What will you be observing? What would be the length of the investigation?

At the start, middle and end of the school year participants will be involved in a group discussion of what they see as the values of using the workbook.

Data: What data do you plan to collect? How? Again, you need information about

both variables (use of book, performance).

A list of ideas expressed during the discussion sessions will be collected by an observer. These will include perceptions about how using the book is or is not useful, and about how each student believes he/she is performing in the subject. Data could be collated as lists of positive and negative comments.

Worksheet 3 Measurement in Psychology

(These answers refer to the three designs set out in the previous worksheet. Your answers will depend on the ideas you put in your table.)

Experiment

The type of data to be collected is *subjective quantitative*.

What data will you collect from each participant?
Each subject will report three pieces of data: how well they believe they **understand** the work they have done (scale of 0 to 10), how **confident** they are in approaching assessment tasks (scale of 0 to 10), and the **mark** they believe they will receive at the end of the year for Psychology (scale of 0 to 20). This data will be collected four times through the school year.

How will this data be presented when all participants' data is collated together?

The *raw* data from this investigation will be presented as a table listing all of the participants' identification numbers, then with twelve columns to record the three pieces of information four times each (see above).

Quantitative observational investigation

The type of data to be collected is *objective quantitative*.

What data will you collect from each participant?
Since it is unlikely that participants will fall neatly into two groups 'used book' and 'did not use book', we could instead record the *extent* to which each student in the study used the workbook. Therefore, two pieces of information will be collected for each participant: the extent to which he/she used the workbook (as a %, calculated by observing their books at the end of the year), and the final SSABSA score for Psychology for each participant. Note that the participants will not be aware of this during the year, as this may influence their use of the book.

How will this data be presented when all participants' data is collated together?
The *raw* data will be presented in a table, listing all of the participants' identification numbers, then with two columns to record the extent of book use and the final Psychology score for each one.

Qualitative investigation

The type of data to be collected is *qualitative*.

What data will you collect from each participant?
A list of ideas expressed during the discussion sessions will be collected by an observer. These will include perceptions about how using the book is or is not useful, and about how each student believes he/she is performing in the subject. Data could be collated as lists of positive and negative comments.
How will this data be presented when all participants' data is collated together?

The data will be in the form of lists of ideas – perhaps as a series of dot points written down by the observers/recorders during the discussions.

Worksheet 4 Analysis of data

Experimental Investigation

The easiest way to show how the data will be summarised is in the form of a blank table and/or graph. In this investigation, the data could be summarised in a table as follows:

	Time of data collection	**Understanding of work** (mean of all scores)	**Confidence in assessment tasks** (mean of all scores)	**Predicted final mark** (mean of all scores)
Experimental Group (used book)	Start T1			
	End T1			
	End T2			
	End T3			
Control Group (no use of book)	Start T1			
	End T1			
	End T2			
	End T3			

Quantitative observational investigation

Two possible ways to summarise this data are: group the participants according to extent of book use and calculate the mean final score for each group (see blank table below), or do a scatterplot graph to reveal any correlation between book use and performance in the subject.

EXTENT OF WORKBOOK USE	MEAN PSYCHOLOGY SCORE
LOW (0 – 20%)	
MEDIUM-LOW (21 – 40 % used)	
MEDIUM (41 – 60% used)	
MEDIUM-HIGH (61 – 80% used)	
HIGH (81 – 100% used)	

Qualitative investigation

The ideas recorded from the discussion groups could be summarised into two lists, those considered positive comments and those considered negative. (It might be necessary to have a third column, as not all ideas are clearly positive or negative.)

Sample Data Analysis

(Note: All calculations are done to one decimal place.)

Workbook usage group	Performance data		
	Mean	Median	Standard Deviation
1 = low usage (9 participants)	611 ÷ 9 **= 67.9**	**67**	**11.5**
2 = high usage) (19 participants)	1557 ÷ 19 **= 81.9**	**85**	**12.6**

What do you think you can conclude from the data?

The means and medians indicate that the students who had a high usage of the workbook performed significantly better on assessment tasks through the year than those who had a low usage.
The standard deviations indicate that the performance scores of the low usage group were slightly less spread than those of the high performance group.

Worksheet 5 Research Ethics

Again, these answers refer to the *experimental investigation* detailed in worksheet 2. Your answers will depend on your design in worksheet 2.

Informed consent

In your planned experiment would you be able to:
* give the participants a full explanation of what would be involved?
* explain the costs and benefits involved in participating?
* gain the participants' consent to participate?
* assure the participants they would not be deceived in any way?

It would be difficult to give the participants a full explanation of what was to be involved, as this would change their approach to their study of the subject, and invalidate the investigation. It would be possible to give the explanation at the end, though it is likely the students would question why one class was using the book and the other was not. It is similarly unlikely that the students would consent to participating in such an 'experiment' in such an important year of their education.

Confidentiality

In your planned experiment would you be able to:
* ensure the participants' identities would be kept confidential (using ID numbers only)?
* avoid invading their privacy in any way?
* seek the participants' consent if you need to get information from other parties, such as their teacher?

All of these should be possible in the proposed investigation. You will experience this when you do your two investigations this year.

Voluntary participation

In your planned experiment would you be able to:
* ensure the participants' participation was voluntary?
* avoid any form of coercion to participate?
* make it clear that they are free to withdraw from the experiment at any time without any penalties or loss?

This would be difficult. It is likely that most students would prefer to be in the class using the workbook, so being assigned to the control group would not be voluntary. It would be difficult to allow anyone to withdraw from the investigation, unless they were able to change classes. This presents its own problems.

Debriefing

In your planned experiment would you be able to:
* explain to the participants the outcomes after it was completed?
* provide a chance for them to ask questions about the experiment or the outcomes?
* clarify any concealment or deception that occurred?

This should be able to be done quite easily.

Possible harm

In your planned experiment would you be able to:
* ensure that the participants would suffer no lasting physical or psychological harm?
* avoid them experiencing embarrassment, guilt or other discomfort?
* respect their dignity at all times?

There are problems here. You would not be able to assure the participants in either group that they would suffer no disadvantage through being assigned to one group or the other. All teachers make judgements about what resources and approaches to use in class (videos, books, discussions, etc), but denying a group of students access to a resource such as a workbook is likely to be seen as disadvantaging them.