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Activity 57

Analysing Quantitative Data

TUTORS NOTES

Purpose: This activity helps students to focus in on, understand and develop their chosen method(s) of quantitative data analysis for their research. It asks them to write a section of a textbook that explains their chosen data analysis method(s) to other students who are studying at the same level.

Type: Textbook/PDF development.

Level: Intermediate and advanced.

Duration: Several hours of work during independent study. The actual duration will depend on the ease with which students are able to undertake this activity.

Equipment/materials: Access to the relevant quantitative data software and/or literature.

Prerequisite activities: If you have students in your group who are intending to use qualitative data analysis methods (alone or together with quantitative methods) you will need to run this activity in conjunction with Activity 61.

Learning outcome: By the end of this activity students will have focused in on, understood and developed their chosen quantitative data analysis method(s) for their research.

The activity

This activity is for students who are in the process of deciding upon, focusing in on and getting to grips with one or more suitable methods of quantitative data analysis for their research. When they are at this stage of their research, give them a copy of the student handout. This asks them to make a contribution towards a new textbook on data analysis techniques, aimed at students studying at the same level. They must write a section for this textbook on their chosen data analysis method(s).

You may find it useful to give a deadline by which all contributions should be submitted to you (ensuring that all students have time to get to grips with their chosen method). Once you have received all contributions, check, edit and put together into a useful resource that can be given to students (a PDF that can be accessed electronically when required, for example).

If you have students in your group who are intending to use qualitative data analysis techniques (in their entirety or as a mixed methods approach) this activity can be run together with Activity 61. The student handouts are the same for each activity so you only need to give one to your students. The tutor’s notes, however, offer information specific to quantitative or qualitative techniques.

Key issues

This activity helps students to understand more about their chosen data analysis method(s) by asking them to provide a written description of the method(s) and its use to other students studying at the same level. In order to explain the method(s) clearly, in a way that can be understood by others, they must first understand in detail what their chosen method(s) entails.
For students studying at advanced level, this also helps them to check that their chosen method(s) fits their epistemological and methodological standpoint, suits the purpose of their research and helps to answer their research question.

Most students who choose quantitative data analysis techniques for their research will choose to use a particular statistics software package. They will need to practise using this package, or take part in a training session or online tutorial, so that they can describe the package when they write their section for the textbook. This will help them to understand whether their chosen package will be suitable for their research, while enabling them to understand how to use the technology. It will also encourage them to think about gathering their data in a way that is suitable for their chosen software, and consider issues such as sampling techniques, validity and reliability.

Popular software packages that students could decide to use, and describe in their textbook entry, include SPSS, Minitab, SAS, Stata, R, JMP and StatCrunch (see Activity 55 for more information about each of these).

Students who are not from a numerical discipline sometimes choose to provide a description of simple statistical analysis techniques when they write their piece: examples of these are given below.

→ Useful terms

The ‘arithmetic mean’ is a simple average of the data where the student adds up the values and divides by the number of items. It is used in ‘interval scales’ when the data are not skewed by extreme values. Interval scales come in the form of numbers with precisely defined intervals and precise comparisons can be made.

The ‘mode’ is the most frequently occurring value in the data, calculated by finding the number that occurs most often. It is used when dealing with ‘nominal scales’. In this type of scale the categories include everyone in the sample, no one should fit into more than one category and the implication is that no one category is better than another.

The ‘median’ is the middle value of the range, calculated by putting the values in order and then finding the middle value. It is used in ‘interval scales’ (when data are skewed) and in ‘ordinal scales’. For ordinal scales answers can be placed on a continuum, with the implication being that some categories are better than others. In this type of scale it is not possible to measure the difference between the specific categories.

See Activity 54 for a definition of ‘descriptive statistics’ and ‘inferential statistics’, Activity 24 for a definition of ‘sample size’, ‘confidence interval’ and ‘confidence level’, and Activity 25 for a definition of ‘sampling frame’ and ‘margin of error’.

→ Related activities

Activity 20: Choosing research methods
Activity 21: Using multiple or mixed approaches
Activity 22: Knowing about probability samples
Activity 54: Making use of statistics
Activity 55: Choosing software for statistical analysis
Activity 59: Ensuring validity and reliability in quantitative research
Activity 61: Analysing qualitative data

→ Preparatory reading

The Software Sustainability Institute (www.software.ac.uk) is a ‘national facility for cultivating and improving research software to support world-class research’. The website contains a wide variety of information that is pertinent to this activity, including information about citing software that has been used in your research, software for data visualization and software evaluation (accessed 15 August 2015).

→ Further reading


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