Increasing business students' Confidence in Questioning the Validity and Reliability of their Research

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Abstract: Business students like to think that their research is of practical value but rarely have the confidence to question the validity of the data they have collected. Teachers expect that students will demonstrate a critical awareness of the limits of their own and others' research. The paper outlines different ways of teaching students how to recognise the key issues surrounding validity and reliability and how to make generalizations from their research.

Keywords: business, research methods, validity, reliability, teaching, learning.

1. Introduction

In this paper we categorise a number of different approaches in the literature to teaching business students about validity, reliability and how and where to generalise from their research. We distinguish four categories in the research methods literature, which we characterise as the positivist outlook, the phenomenological, the embedded, and the skills-type. Informed by these different ways of dealing with the subject, we describe three different approaches to teaching students how to assess the validity, reliability and extent to which data they have collected and things that they have read can be generalised. The aim of this ongoing research is to establish teaching methods that enable business students to think about information within a context, assess the value of the information and become critical independent learners.

Much student written work in business and management, whether for course work assignments or undergraduate and Masters dissertations, neglects to consider whether the data relied on as sources for the assessed work is academically rigorous, or indeed whether the assemblage created by the student will itself withstand rigorous scrutiny.
Our experience as teachers in higher education is that students tend to look at information in isolation. When required to search for or use information, students at both undergraduate and post-graduate level are no longer to be found in libraries surrounded by shelved books, but in pooled computer rooms, downloading information while exchanging messages with friends and playing the odd online game. The modern context of study and research thus exacerbates the problems many business and management students seem to have of thinking about information and linking it together. Perhaps there is a generational change in the approach to information and usage, as material is so frequently read out of context.

Students' ability to question what is being collected and read is impaired by this atomisation of information gathering, so that little attempt is made at linkage and synthesis during the information-gathering phase. Although in many cases, the assessment criteria may require students to reflect in their written work on the validity and reliability of the information they have assembled, too often this is also decontextualised, with reflection coming too late in the process. It is then viewed as a bolt on necessity to meet marking criteria, if done at all.

As teachers, we need to acknowledge this change and to develop ways of making knowledge that was either taken for granted (Thomas 2003) or was implicit (Berry 1997) explicit by, for example, ensuring that it is formally taught, practised and assessed. There is some psychology and education literature on implicit learning that demonstrates that it is clearly a process (Reber 1967) but unfortunately it is one that is little understood, and where research is bedevilled by problems of methodology and measurement (Atherton 2002). A search through the research methods literature enabled the authors to identify four categories of approaches taken by

various authors when trying to explain and apply the concepts of validity, reliability and generalization in business and management research. A discussion of these four categories now follows.

2. The literature

2.1 The positivist view

Management research in the past and much that is still carried out today tends to emanate from a broadly positivist approach to the discernment of reality. If the assumption is that most research is likely to take place within this paradigm, then it makes sense to discuss issues such as validity, and reliability within the confines of a discussion of where these issues fit most conveniently, such as in a chapter on sampling. Empirical social science research, on which so much management research draws for its philosophical approach and research methodology, uses four validity tests (Yin 2003). These are construct validity, internal validity, external validity and reliability.

The key test for validity is sometimes presented as whether what was found was a response to the questions originally asked. A common explanation of the term is whether what has been measured is actually what was intended to be measured when designing the research (Mason 1996, Collis and Hussey 2003). Some textbook authors describe this as being face validity, (Collis and Hussey 2003) others as internal validity, yet others as measurement validity (Saunders et al 2003). In a quantitative study, the test for internal validity is how confident the researcher is that the independent variable is at least partly responsible for the variation found in the dependent variable (Bryman and Bell 2003). If the initial purpose of the research cannot be answered, because the data actually collected answered a rather different question, then there is no internal validity. A second aspect of validity, external validity, is whether the results could be applied to other contexts or situations and to what extent this may be possible. In quantitative studies the representativeness of the sample is the key issue in generalising to a larger population.

Among recently published business research methods textbooks, Cooper and Schindler (2003) may be taken as exemplars of the positivist approach to business research. In a book that deals only with quantitative empirical approaches to business research, chapter eight discusses methods of evaluating a research tool used for "scientific measurement" (p231) in terms of its internal validity, reliability and practicality, the last being defined as economy, convenience (for the respondent) and interpretability. The guidance to the putative researcher is not always very clear. For example, Cooper and Schindler sub-divide internal validity into three aspects. The first is content validity – the test is does the measure adopted fit the data that is to be or has been collected? This is a judgemental issue, and they suggest the designer of the research, and an independent panel of experts can best judge it. This is hardly objective, and not very positivist. They also discuss what they describe as criterion-related validity – the success of the measure to predict an outcome. For example, opinion polls may be used to predict the outcome of an election (predictive validity), or correctly to categorise something (concurrent validity). They suggest that again this may be difficult to validate in practice, with the researcher able only to use other secondary data. This begs the question as to the utility of the original research - if the secondary data is so good it is arguable that you would not be doing the new research in the first place. Their discussion of construct validity offers even less guidance, suggesting that it is an abstract concept, which makes it harder to validate, and the researcher needs to consider the theory and the measure together.

In the positivist paradigm, much of the history of thinking about the validity of research design comes from experimental research **(**Cooper, 1998) yet even for these highly quantitative studies, the issues are not as clear-cut as they may first appear. Experimental researchers use triangulation, for example when less than "perfect" studies have to be carried out. Later researchers have expanded the eight threats to internal validity in experimental research originally distinguished by Campbell and Stanley 1963 (cited in Cooper 1998). Similarly, although external validity was originally

seen as relating to the generalisability of the research based on the rigour of the research design, subsequent studies have referred to population validity, ecological validity and added other validity parameters, such as statistical validity. The whole approach is problematic – different researchers use different lists of threats to validity classified under different headings, and there is no established guidance as to the relative weight to be given to each of these. Cooper (1998) concludes that the important point is that the rigour of the approach and the transparency of the thinking are made clear – not whether a checklist or some other didactic method of teaching incorporates all these dimensions.

Reliability is sometimes seen as an assessment of whether the same findings would be obtained if the research were repeated, or if conducted by someone else. This definition is problematic in business and management research as any social context involving people makes replication difficult (LeCompte and Goetz 1982). In a quantitative study reliability is about the consistency of results, and the robustness of the measure, and whether it is free of random or unstable error. According to Cooper and Schindler (2003), stability, equivalence and internal consistency are key concerns. Reliability estimates, they suggest, can be of three kinds: test-re-test, whereby the same sample is asked the same questions again a few weeks later; an estimate or whether alternative forms of the same measure produce similar results – so these are administered at the same time; and split half correlations using Kronbach's alpha or KR 20, which measure the degree of consistency between say the two halves of the answers to a questionnaire.

These approaches can be taught and probably will be during a discussion of sampling theory, where the issues arising from the use of probability and non-probability samples will also be aired. The problem for the student, and for the teacher, is the stress on issues of judgement and abstract measures, and on cumbersome practices which, according to Bryman and Bell (2003) few researchers carry out in practice. Few published research reports discuss the reliability and validity of their data in the terms suggested in the methods books. Evidence cited by Bryman and Bell from published quantitative research in organisation studies (Podsakoff and Dalton 1987) suggests that authors seldom report tests of the stability of their measures and only three percent of the articles they looked at provided evidence on tests for validity.

2.2 The phenomenological view

Validity, reliability and issues to do with generalization can also be discussed when considering qualitative research designs. The problem is where to deal with it, and what to say. While some authors seem to contend that what we have described as the positivist view is applicable to other research methods and approaches out with this paradigm; others argue strongly that it is not applicable. Some writers do not think these criteria are ever relevant, for example measurement has arguably little sense in qualitative research, so it is questionable whether the issue of validity is of concern at all. External validity can be seen as a potential problem, because the use of case studies and small samples makes it hard to generalise to other cases or wider populations. Generalization is seldom dealt with at any length in discussions of qualitative research methods, and is actively rejected by some authors as an objective of qualitative research (Schofield 1990).

Other authors do suggest that validity and reliability are relevant to qualitative research. LeCompte and Goetz (1982) contend that external reliability (replicability) does have a parallel in qualitative research, for example in repeat focus groups or ethnographic studies, where it is important to mirror the role adopted in the first study by the researcher in subsequent ones. Internal reliability has a parallel in qualitative research in terms of inter-observer consistency, which is a test of whether observers see the same things. Internal validity can be seen as a strength of qualitative research (Bryman and Bell 2003) because the researcher spends so much time over a long period on observations, and so is able to ensure a high level of fit between observations and concepts.

Other writers adopt a different stance on qualitative research. Guba and Lincoln (1994) propose two key criteria for

assessing qualitative research – trustworthiness and authenticity. Trustworthiness has four aspects in this scheme. These are credibility – attested to again by triangulation, or by confirmation by those who were researched that the investigator correctly understood what was going on. The second is transferability; a key test here is whether the data is sufficiently rich to enable other researchers to make judgements about its possible transference to other contexts. Boosting the trustworthiness of qualitative research could be achieved by getting peers to audit your research process to confirm that it was carried out correctly - this is dependability. While this initially appears simpler to apply, it hinges on the systematic documentation of every part of the research process followed by extensive use of auditors to check the process. The auditing process may be carried further so that auditors could also check that personal or theoretical inclinations have not caused researchers to bias the research. This they describe as 'confirmability'.

Authenticity also has four criteria, according to Guba and Lincoln, concerned with the wider context of the research. These include fairness – does it represent all viewpoints in a particular setting? For example, were employees from all levels interviewed or just senior managers? (Does this matter if you only want the views of senior managers?) Another criterion is ontological authenticity – does the research help to enhance understanding of the social context? They also suggest three other aspects of authenticity which reflect their views as critical theorists – educative authenticity (has it helped people in the research to appreciate others' views in their setting) and catalytic authenticity (has it acted as an impetus to participants to change things) and tactical authenticity – has it empowered them to do this?

Common sense and the practicalities of doing research start to collide with some of these visions. Auditing a qualitative research study would be a massive undertaking, given the quantities of data involved, and it would be difficult to guarantee the independence and rigour of the auditing process itself. Would it be done by another institution? Or even by researchers from another discipline or research tradition? Would the results be proportional to the efforts involved? Writing on ethnographic research, and so firmly in the qualitative camp, Hammersley (1992) takes a less extreme view, and suggests that the plausibility and credibility of a researcher's claims are the key issues in qualitative research. Relevance is also crucially important, judged by an assessment of the importance of the topic within its field and what contribution it makes to the literature.

Generalization is sometimes seen as a weak point in qualitative research: a case study is not a sample of one it is not a sample at all (Bryman and Bell 2003). This is potentially a big problem for business research. A lot of management research is based on in-depth case studies in a few companies over a long period, but we simply don't know if success or disaster in one company can be generalised to others (Raimond 1993). Many writers seem to agree that the findings of qualitative research can be generalised only to theory and not to populations, and this underpins much social science thinking. It is the quality of the theoretical inferences that makes qualitative research generalisable. However, some authors make bolder claims. Yin, a management researcher who, though a leading proponent of the case study method adheres to a broadly positivist frame of reference, suggests that replication of case study methods can achieve greater generalisability of theory (Yin 2003). Schofield (1990) argues that judgements about the match between the single situation studied and others to which one might be interested in applying the concepts and conclusions of that study is what enables qualitative researchers to make informed judgements about where and to what extent they can generalise results. She contends that careful selection of the typical, or of situations judged likely to become so in future, or those that are exceptional can increase the generalisability of qualitative research.

2.3 The embedded view

Another way of dealing with issues of validity, reliability and generalization within research methods is to embed discussion of these aspects within learning about each discrete research method. There are arguments both in favour and against this. In favour of this approach is the suggestion that these issues are part of

thinking about any research design, strategy, or method and are key issues in analysing data and drawing conclusions. It is important therefore to discuss them at every stage of a research project. Unfortunately, these discussions can then become quite rather mechanical and repetitive.

Issues of validity, reliability and generalization need also to be considered when reading, discussing and analysing secondary data, and within the context of applying management theories to case studies. A common problem for students at various levels is to assess the extent to which their findings may be applied to another context (Vogt 1993), but in practice very few authors attempt to provide thorough advice on this. A notable exception is Raimond (1993). In three chapters of his book on research design, he considers the research validity, the reliability and the generalisability of the conclusions of Peters' and Waterman's *In Search of Excellence*, Michael Porter's industry analysis and his generic strategies, and Hofstede's *Culture's Consequence*. He takes the reader step by step in examining the premises of their arguments, their research designs and methods, the underlying logic of their argument, empirical tests of their reliability and generalisability and the conclusions they draw. There are useful additional lessons to be drawn from these studies, as viewed in historical perspective, as each is now at least twenty years old. Additional tests of reliability and generalisability not found in the research methods literature reviewed above apply here in terms of the currency of the research and its applicability in different cultural contexts. For example, Peters and Waterman looked at 63 excellent companies and tried to ascertain what the lessons were that could be learnt from their success. By the mid 1980's 14 of Peters and Waterman's companies were in trouble. The applicability of Hofstede's research in one organisation to generalizations about national cultures is also a key issue in terms of its generalisability.

2.4 The skills view

Trying to make our students more critically reflective, and reflecting on the validity, reliability and generalisability of what they read think and collect in terms of data is all part of the learning process. Learning means different things to different people. Säljö (1984) classified the conceptions held by respondents in his interview-based study into five categories. The first three are categorised as a surface approach to learning. They are acquiring information or "knowing a lot", storing information that can be reproduced, and retaining facts, skills and methods that can be used as necessary. Categories four and five equate to higher level deep learning: learning as making sense or abstracting meaning, and learning as interpreting and understanding reality in a different way.

One of the goals in our teaching has been to help students to develop a critical approach, which we would classify as deep in the sense described by Marton and Säljö (1984). As reported previously (Smallbone and Quinton 2002) we have been trying to help students to develop a critical approach through the encouragement of critical reading skills. The rest of this paper discusses three different approaches to teaching validity, reliability and generalisability, which we suggest encourage deeper learning at undergraduate and Masters level through emphasising the development of skills of reflection on the validity, reliability and generalisability of research within a critical framework.

3. Teaching validity, reliability and how to generalise

Drawing on the research methods literature, and our knowledge of the way students learn, and the motivating impact of assessment (Ramsden 1992), we distinguish three approaches to encouraging students to learn about and to practise the critical skills associated with learning about the validity, reliability and generalisability of their own and others' research.

One approach, used on most undergraduate assignments in the Business School, at Oxford Brookes University, consists of creating and using an assessment grid (see O'Donovan, B, et al 2003), which the students are given (see table 1 below for an extract from one of these). There are no specific marks attached for critical application of reliability, validity and generalization, but it is assumed that in order to achieve an A

grade implicit consideration has been given to the rigour of information used within the discussion of range of sources.

Table 1: Assessment criteria grid.

Criteria	A grade	B_+ grade	B grade	C grade	Refer/Fail
Use of literature / evidence of reading	Has developed and justified argument using own ideas based on a wide range of sources which have been thoroughly analysed applied and discussed	Able to critically appraise the literature and theory gained from a variety of sources, developing own ideas in the process	Clear evidence and application of readings relevant to the subject; uses indicative texts identified	Literature is presented uncritically, in a purely descriptive way and indicates limitations of understanding	Either no evidence of literature being consulted or irrelevant to the assignment set

Although useful in enabling teachers to explain with some consistency what students need to do in order to achieve particular grades, our experience in practice is that this is a rather over-simplified indicator and that only the most able students actually manage to un-pick the meaning of the grade criteria. As they are not specifically mentioned, the less analytical students do not register the need for thought about validity, reliability and generalization and so this method is of limited usefulness on its own.

A more detailed and explicit approach involves teaching the students, in seminars, how to de-construct a journal article using a framework to help them analyse and assess the value of the paper (see table 2 below). The methodology and methods are examined and discussed and students practice critically reading a paper so that they can begin to recognise rigorous research (or the lack of a rigorous approach). It is the intention that the students then apply the same principles to the data they read and collect for their assignments.

In this instance the students were asked to read an article by Shoham and Dalakas (2003) concerning the role of parents and teens in family decision making in Israel prior to a seminar. The subsequent seminar was entirely devoted to the reviewing of this article. A fairly lively discussion commenced about the value of the paper and the weaknesses in the method used, which the students seemed to identify easily. Shoham and Dalakas had in the article, unusually, briefly reflected upon the limits of the validity, reliability and extent of generalization of their research, including their use of a convenience sample, which they defended with some vigour. However it was interesting to note that although the students could identify many weaknesses they did not question the validity, reliability and generalisability of Hofstede's work (1984) on which the paper was entirely based, but which it did not question. Therefore it would seem that this approach created some awareness of these issues, with the students being able to assess the rigour of the immediate research, but they still lacked the confidence or the ability to tackle the validity of the assumptions underpinning the research.

Table 2: Critical reading framework.

What to look at:	
Date – when was the research reported on actually done?	
How current are the results?	
Author's credentials?	
Data collection methods – what did they actually do?	
Style	
Is it constructed clearly?	
Can you follow the argument through a logical development?	
Does the use of tables, charts and diagrams add value to the conclusions or the explanation?	
Analysis	
What is the central issue dealt with in the paper?	

What assumptions have been made e.g. about the generalisability of the results?	
What is the evidence supporting these assumptions?	
In what ways is this article similar or different from others you might have read?	
Reflection	
How do you respond to what the author is saying?	
How do you rate this article?	
How does it relate to other concepts you have come across?	
Does it point to further research in a particular direction?	
Is it relevant to your current work?	

Having used table 2 for eighteen months, the authors felt that it required adaptation based on feedback from students. The critical framework has now been separated into two templates, one for papers discussing primary research as in the example cited above and a second template for purely conceptual and theoretical papers, for example literature reviews. The second template asks questions such as *how do you assess its academic quality?* It will be piloted in September 2004, with both undergraduate and postgraduate level business students.

Our third approach is to combine these two steps and to go one step further and to link the issues of validity, reliability and generalization explicitly to learning outcomes and to the assessment criteria, see table 3 below. As part of their assessment on one core module, which we jointly run in the second term of the second year, undergraduate marketing students write an essay. For the first time, this year the explicit assessment criteria include that it must contain a minimum of 8 cited references and 400-500 words on the validity, reliability and generalization of the sources used, out of a total of approximately 3000 words. Marks are attached to each of these criteria. A short teaching session on how to meet these criteria was run as part of the module.

Table 3: Linking validity, reliability and generalization to assessment criteria.

Criteria and format Your essay should contain an introduction, several developed themes and then a conclusion or series of conclusions. It is essential that it is based on a wide range of reading and it is important that you draw on the main theories about buying behaviour and critically review the material you use. Between 400 and 500 words of your assignment should assess the significance, validity, reliability and the extent to which any of the sources you draw on can be generalised. The Business School requires all written work to contain a bibliography. For this module you are also required to include citations in the text and a list of references that will include at the minimum eight different sources, of which a minimum of three should be books and a minimum of three articles from academic journals. References must be both cited in the text and listed at the end of the report. The Harvard system of referencing is to be used. The total number of words should be no less than 2,500 and not be more than 3,500.

The outcome was that the better students made an attempt to meet the criteria, but many tended to write an essay drawing on a few key sources, and then in a separate section denounce these same sources. The reasons given were legitimate in terms of developing an approach to validity and reliability, and included the use of small or convenience samples, limited applicability outside the study's immediate context, being culturally specific and hence not generalisable to the UK, out of date, etc. But the students did not seem to notice the inherent contradiction in their work until it was pointed out to them. The weaker students chose either to ignore the requirement altogether or confined themselves to general platitudes that did not involve reflection. However, some students demonstrated a considerable reflective element to their work in their discussion of the sources, and in the follow up discussions about the module, many of the students while recognising their weakness in this area, suggested spontaneously that this was something

that they needed to improve in order to research and write their dissertations in their final year.

At Masters level, we have always followed the embedded strategy in teaching validity, reliability and generalization. Reflection on validity, reliability and generalization has always been practised and assessed through the dissertation and indeed in course work for other modules, as a critical component of Master's level learning. The problem is where on the course to teach it. Arguably it falls to the research methods teaching team and in the past we have taught it when thinking about research strategies, when discussing case studies as a research method, and in the session on evaluating secondary research. We also teach it in critical reading but still wonder if this is sufficient? From our experience it is the concept of generalization which causes the most confusion, but that may not be surprising considering the disparate views on generalization that are held by the academic community.

4. Conclusion

In this paper we have highlighted some of the issues surrounding how to assess the rigour of research, specifically its reliability and validity and where generalization is appropriate. Four categories have been identified from the research methods literature as an aid to untangling these somewhat abstract concepts and the different ways in which they are treated in the literature. There is little unambiguous practical advice for student researchers and this adds to their confusion.

Based upon the literature we have reviewed, our experience as research methods teachers and our identification of this lack of explicit guidance, we have described three different approaches used in our teaching to encourage student thinking about validity, reliability and generalization. Business students need to recognise these issues both in the research they read about and use and the research they themselves undertake. Deciding whether 'my research is any good?' is a core skill that has to be taught, practised and assessed. This paper contributes by suggesting teaching methods for encouraging business students to read more critically and reflectively and thus to become better researchers.

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