

## **Mixing Research Methods in Health Professional Degrees: Thoughts for Undergraduate Students and Supervisors**

**Sophie Anaf**

James Cook University, Townsville, Australia

**Lorraine A Sheppard**

James Cook University, Townsville, Australia and University of South Australia,  
Adelaide, South Australia

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*This commentary considers some of the challenges of applying mixed methods research in undergraduate research degrees, especially in professions with a clinical health focus. Our experience in physiotherapy academia is used as an example. Mixed methods research is increasingly appreciated in its own right as a “third paradigm,” however the success of educating novice researchers in mixing methods requires reflection on a range of theoretical and practical issues. We explore some of the under-reported features of mixed methods on a theoretical level, including the use of terminology, and the challenge of research “labels,” and on a practical level, the benefits of including mixing methods in clinical research and the issue of appropriate examination. Key Words: Mixed Methods, Student Research, and Qualitative and Quantitative*

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### **Introduction**

Professions within the spectrum of health care know the value of research to advance clinical practice, to validate assessment procedures or management options, and to disseminate to the health (and broader) community the contribution each profession makes to enhancing patient well-being. Physiotherapy is an excellent example of an increasingly research-oriented profession, following a similar trajectory as other health professions such as nursing, occupational therapy, social work, and speech pathology. Concurrently, mixed method research techniques in clinical health professions are gaining increasing exposure as a viable “third paradigm”. Mixed methods researchers such as Creswell, Sandelowski, and even Glaser and Strauss have long-described the benefits of mixing quantitative and qualitative designs: enhanced triangulation, a more robust development of theory, and the potential to more comprehensively understand the research situation (Borkan, 2004; Creswell, Fetters, & Ivankova, 2004; Glaser & Strauss, 1967). Although mixed method designs have been used in health research, nursing being one progressive example (Sandelowski, 2000), its use in research by Australian allied health professions such as physiotherapy is less obvious. Reflecting on why this may be so, we have drawn on our own experience of conducting and supervising such research at an undergraduate level. Some of the key challenges with using mixed methods in clinical health professions’ research can be separated into theoretical and practical considerations;

each impacts on the research outcomes. The focus of this paper are issues for undergraduate students and supervisors that occur prior to conducting mixed methods research, with the hope that all parties can fully appreciate the complexities and benefits to using such an approach. This paper is designed to stimulate ideas and debate (as opposed to being prescriptive) in order to advocate for the appropriate use of mixed methods for student research.

### Theoretical Considerations

At first glance, “mixed methods” is synonymous with the combination of quantitative and qualitative techniques. Borkan (2004) defines mixed methods research as “those studies or lines of inquiry that integrate one or more qualitative and quantitative techniques for data collection and/or analysis” (p. 4). However, Sandelowski (2000) and Bryman (2006) suggest that the terminology of “mixed methods” is not as simplistic as it seems. It is reasonable to assume that novice undergraduate researchers will take the first step in learning the difference between “qualitative” and “quantitative” research. Our experience has been that students seek succinct definitions in order to understand the framework of the research and, importantly, their perceived effort required for the research. One such example of a simple representation of the differences between the paradigms is provided by Key (1997), who cited Merriam (1988); refer to Table 1. The paradigmatic difference between aims, processes, and goals when laid out in such a manner is reasonably “black and white,” with little obvious suggestion as to how the paradigms can be used complementarily within the same research project.

Table 1

#### *Features of Qualitative and Quantitative Research*

| <b>Comparator</b>            | <b>Qualitative Research</b>                                | <b>Quantitative Research</b>                   |
|------------------------------|--|--|
| <b>Focus of research</b>     | Quality (nature, essence)                                  | Quantity (how many)                            |
| <b>Goal of investigation</b> | Understanding, description, discovery                      | Prediction, control, confirmation              |
| <b>Sample</b>                | Small, non-random, theoretical                             | Large, random, representative                  |
| <b>Data collection</b>       | Researcher is primary instrument, interviews, observations | Inanimate instruments, surveys, questionnaires |
| <b>Mode of analysis</b>      | Inductive  | Deductive                                      |
| <b>Findings</b>              | Comprehensive, holistic                                    | Precise, reductionist                          |

*Note.* From “Qualitative Research,” by J. P. Key, 1997, *Research Design in Occupational Education*. Copyright 1997 by Oklahoma State University. Adapted with permission.

Given the seemingly incongruent qualities of either paradigm, why would a student consider mixing methods as a guiding framework to research? Mixed methods/methodologies research has great appeal when there are multiple facets of a research question that need exploring, and one method is simply not sufficient to address all the issues at hand. For example, students in health professional degrees such as Physiotherapy are encouraged to consider the impact of any intervention or treatment on

the patients involved, given that such professions exist to enhance the well-being and independence of numerous patient populations. Therefore, a vast number of projects will involve the patient and family as the focal point of research. A mixed method approach can provide a robust, sophisticated direction for a research project, especially when there are themes to the research that will be insufficiently explored by statistics alone. The contribution of the qualitative paradigm, for instance, is reputed to not only be able to offer insight into personal experiences, but also permit exploration of unknown facets of the health care system and the people within it (Rice & Ezzy, 1999). Sandelowski (2000) proposes that mixed method research is necessary as "...the complexity of human phenomena mandates more complex research designs to capture them" (p.246). Barbour (1999) concurs, adding that a mixed method design can not only enhance the data analysis opportunities for research (e.g., supporting qualitative themes with descriptive statistics), but it can further justify the sampling strategy of a project, and permit greater triangulation within the research (a common feature in traditional qualitative research methodologies).

The challenge for undergraduate researchers becomes synthesising the seemingly disparate features of the qualitative and quantitative paradigms into a robust research design. Perhaps some reframing is in order; think of mixed methods not so much as "mixing", but rather as "collaborative." Sandelowski (2000) argues that mixed method studies are not necessarily an attempt to merge the paradigms (which may be a reasonable assumption by a novice researcher thinking about "qualitative" versus "quantitative" styles – see Table 1), but rather the paradigms are emergent depending on the research techniques selected, and will become increasingly understood by the researcher as the study progresses. Although it is important that undergraduate students have a clear understanding of the guiding paradigms of research prior to selecting data collection techniques, it is the researcher's immersion in the data that will clarify why the choice of a mixed methods approach is appropriate. By way of illustration, has statistical analysis revealed surprising variables within the sample population, and how can subsequent qualitative analysis explore these findings on a deeper level? Has a particular theme emerged that requires the student to return to the participants or data set and use quantitative or qualitative techniques to further clarify findings? Mixed methods research can stimulate an iterative approach to analysing the project data that may otherwise be explored somewhat superficially.

Sandelowski (2000) has suggested that the key difference between using the terms "qualitative" and "quantitative" at a *paradigm* level is the researcher's management and interpretation of the data. In addition, Bryman (2006) cites two extra descriptors of mixed method/mixed methodology terminology that may offer the novice researcher another perspective on this concept: *multi-methods* and *multi-strategies*. Rather than implying a *mixture* of more than one research approach, the term "multi" may offer some initial clarification for the student that more than one research style is being employed, and that it will require reflection on how each approach can build the research framework and subsequent design.

One of the questions we reflected upon is, "Does the use of quantitative and qualitative approaches in a research project mean one is mixing the methods, or the methodologies?" If we observe Sandelowski's argument, and even Bryman's (who describes "multi-strategy" as an increasingly favoured term), there is a tendency to

perhaps favour the combination of *methods* as the true indicator of a mixed methods approach. “Methodology” is defined as “the system of principles and procedures used in scientific endeavors,” in contrast to “method,” which implies “the systematic manner, procedure, or technique in performing details of an operation, tests, treatment, or any act” (*Taber's Cyclopedic Medical Dictionary*, 2005). Thus, the methodology implies to us that consideration is warranted of the broader rules and principles that will govern a research method (e.g., phenomenology guiding interview design), in contrast to method alone (e.g., conducting interviews). It is therefore an important first step for students to appreciate the difference between methods and methodologies; the former concerned with the nature of data gathering and the techniques used to conduct research; the latter the philosophies and theories guiding the research and its subsequent analysis.

The terms “mixed methods” and “mixed methodologies” could imply two different research strategies, depending on whether or not one paradigm is dominant over the other in the research. An example of “mixed methodologies” may be the equally important use of interview techniques (reflecting a phenomenological approach) and quantitative survey instruments. The contribution of both the quantitative and qualitative paradigms may be evenly balanced, so that there is no one feature of the project that is more influential. In contrast, if the dominant paradigm in the research is (for example) a qualitative approach, such as the use of semi-structured interviews, and quantitative techniques have provided a secondary contribution in determining the interviewees (e.g., particular respondents from a statistically analysed questionnaire), this may be more appropriate to consider as “mixed methods”. The theoretical contribution of the quantitative paradigm in this instance, whilst useful in rigorously determining participants, still remains secondary to strengthening, testing, and reinforcing the dominant qualitative approach, as the interviews are the crux of the research project; these results are likely to garner the most attention and reflection by the readers.

Another consideration that students and supervisors alike should note when mixing methods/methodologies in health professional degrees is what we term affectionately as “the challenge of labels.” This is particularly relevant when qualitative theory and techniques play a significant role in the research design. One example we refer to is the issue of labelling the qualitative approach as “grounded theory,” as this has been a source of discussion from our own research. However the following comments are certainly true of numerous other research strategies. The term “grounded theory” will imply different levels of research “purity” to different individuals, and for undergraduate research projects this may prove contentious. Glaser and Strauss (1967) discussed grounded theory in relation to mixed methods forty years ago.

*In many instances, both forms of data are necessary – not quantitative used to test qualitative, but both used as supplements, as mutual verification and, most important for us, as different forms of data on the same subject, which, when compared, will each generate theory. (p. 18)*

The challenge of selecting any label or terminology in research is that it raises expectations and preconceived ideas about what the label conveys. For someone who considers him or herself to be a traditional or “purist” grounded theory researcher, all stages of the approach will have meaning and relevance in generating theory from the

research. For example, there are explicit stages to be achieved including the open and axial coding of data and a commitment to generating results and themes that are “grounded” in the data. Grounded theory develops and understands links as the analysis occurs and relies on limited analysis of prior research and opinions before data collection commences (Cutcliffe, 2000). There may be aspects of analysis, such as coding and theory building, which are appealing to use for a student. He or she may not, however, identify with the project being a “pure” grounded theory approach, to the chagrin of the more traditional grounded theory researchers. Stern (1992) argues that as long as one does not proclaim to be generating pure grounded theory, hybrid methodology can still have positive implications for research (mixed method/methodologies may be considered as such). This “borrowing” what suits the research may be open to criticism by a grounded theorist, as it is not following all steps of a truly grounded approach. However, it may also be necessary in time and scope-limited student research, especially when there is an expectation of students to conduct literature reviews on prior research in the area (contrary to the grounded theory philosophy of limited exposure to the research area), and funding allocated to honours research means that smaller-than-ideal samples of participants are possible. To this end, supervisors and students need to be careful about allocating labels such as “grounded theory” to research without substantial justification as to how and why the label is appropriate. This is not to suggest that the quality of mixed-methodological research is necessarily undermined, especially if Stern’s argument is taken on board, but rather that the meaning of different “labels” will be taken to heart in varying degrees by different readers and researchers, and the students must be fore-armed and fore-warned about the potential for debate.

### **Practical Considerations**

The practical issues that emerge conducting mixed methods or mixed methodologies research can be overlooked by many novice researchers. One of the most important challenges Australian undergraduate students in health degrees face is combining the demands of research with the demands of clinical caseloads. In Australia, research degrees, such as honours particularly in the health professions, are integrated into the undergraduate coursework over the final two years of the degree. Concurrently, the student’s requirement of working on hospital rotations or in clinical health services, not to mention the increasing expectation to work in a rural location, increases commensurate to progressing through the clinical program.

As there is seldom a dedicated year to conduct research, it is reasonable that students and supervisors question whether or not the project requires a comprehensive mixed methods (or methodologies), or whether or not the student has the capacity to learn *both* quantitative and qualitative styles at the same time as undergoing clinical workloads. Such reflections at an early stage on the student’s part are important, as it is easy for supervisors to underestimate the challenge of learning theory, epistemology, statistics, and so on. Additionally, mixed methods/methodologies research more often than not takes greater time: recruitment, sampling, statistical or theoretical analysis *prior* to undertaking the next stages of research (such as survey results leading to the development of participant interviews). To ensure that the project is appropriately built-upon requires great organisation, commitment, and autonomous motivation whilst working clinically.

Students need additional time to justify and explain how quantitative and qualitative paradigms fit together; the necessary analysis of data, and the appropriate presentation of results to reflect both approaches appropriately. It is wise to consider these practical issues as early as possible, and as honestly as possible, for the maximum chance of success.

Another important point to be made is the imbalance of qualitative and quantitative research in academic settings, especially those with a health focus. Health professionals and students are increasingly being drawn into the concept of evidence-based practice; the classic definition being,

the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research. (Sackett, Rosenberg, Muir Gray, Haynes, & Richardson, 1996, p. 71)

The expectation that research in fields like physiotherapy will produce “clinical” results is extremely high, as this not only validates intervention techniques and management strategies, but familiarises clinicians and the public with the scope of the profession. Additionally, the National Health and Medical Research Council (NHMRC) supports a hierarchy of evidence, rating tightly defined quantitative studies, such as randomised controlled trials, above almost all others. Supervisors should be mindful of the appeal this may offer a student to choose pure quantitative research, with its tight clinical focus and easily quantifiable outcomes. In that respect, mixed methods/methodologies research is in an interesting position. If health and medical fraternities, and associations such as the NHMRC, have a core research methods/methodologies curriculum focus on quantitative methods, this leaves the novice researcher looking at qualitative aspects with fewer pointers, fewer past examples to cite relevant to an undergraduate level, and the perceived added “burden” of having to learn and apply an additional qualitative section.

Perhaps some explanation and discussion regarding what a mixed methods (or methodologies) approach can offer a student is necessary. Certainly, one advantage is that a student will gain a solid understanding of the benefits of both quantitative and qualitative research. The capacity to triangulate analysis processes can enhance rigour by considering the research issue from a more holistic viewpoint. So, not only is the generation of “clinical” results possible, but including a qualitative framework raises the appreciation of the qualitative paradigm at the undergraduate level, allows alternate meanings and values of the research participants to be considered, and improves the potential to publish qualitative findings in mainstream clinical journals. The possibility of wider dissemination of findings will be largely due to the fact that the process of both quantitative internal validity and qualitative triangulation is transparent throughout the research, enhancing rigor and illustrating the extra value and additional information a mixed approach can bring.

A final issue that encompasses both theoretical and practical elements of research is the academic assessment necessary for mixing methods. The examination process, both at university and with the academic journal review process, has the potential to be contentious. In our experience, marking criteria for research projects at the undergraduate

level will often incorporate terms such as subject selection, dependent and independent variables, and reliability and validity of procedures; highly quantitative terminology consistent with an emphasis on clinical research. We, as mixed method or qualitative researchers, would understand that it is difficult to think about features of qualitative research using such terms, as it compromises the credibility of the qualitative contribution to the research. A conflict emerges: Are we suggesting an examiner is expected to “quantitize” qualitative research to fit marking criteria? Can examiners have the foresight to think of aspects of qualitative research in mixed method projects from the “same-yet-different” perspective of trustworthiness or dependability?

Clinical research journals, particularly in physiotherapy, are heavily biased towards quantitative research designs. This is somewhat understandable, given the current expectation of evidence-based interventions for patient safety and care. However, an examination framework that adopts quantitative categories limits its ability to adequately evaluate qualitative work and also hampers the understanding and appreciating that mixed methods/mixed methodologies work as well. If there are two markers, one a quantitative researcher and one qualitative, neither may be wholly satisfied with the research. Neither reviewer can easily assess the research as a “whole,” giving each section of the research due care and consideration, unless the reviewers are confident that their prior experience in research has adequately involved using both paradigms. This is potentially detrimental to the fair evaluation of the student’s research as well as his/her confidence. We propose that mixed methods/methodologies research is worthy of independent marking criteria that appreciates the student’s capacity to robustly apply both quantitative and qualitative features. In the 1980’s Eisenhardt outlined processes of building case study theory by illustrating some simple yet key concepts that should at least be *considered* when using such an approach (Eisenhardt, 1989). This was an important benchmark to illustrate rigor of the process of conducting a particular research method. Certainly, not everything about mixed methods can be formulaic in the way that Eisenhardt proposed for case study research, but it would be infinitely useful to have some grounding concepts for the novice researcher: exemplars of research, how to best build upon the research by applying qualitative and quantitative approaches, and key features/processes to consider when attempting to publish or present findings. This ultimately rests in the hands of supervisors and experienced researchers to disseminate their own mixed method commentaries and research findings as widely as possible.

A final thought on this topic; we propose that the convention of writing in the first or third person could be dictated by the dominant paradigm in the research. This becomes an increasingly subjective decision if equal weighting is given to both paradigms in the research, but we believe that it is important that the writing style used in composing a research article should reflect the main paradigm used in that research. The practice of writing in the first person is reflective of many traditional qualitative approaches, perhaps encouraging a further appreciation of qualitative research’s difference from quantitative conventions. Examiners and reviewers should respect the justification that students and supervisors have offered for their writing style, appreciating it in the context of their research aims, rather than blindly following standard procedure of clinical journal documentation. This is an important skill for students to develop as independent researchers, enhancing their appreciation of the subtleties of each research approach, and

exposing, where necessary, the often underappreciated formats of qualitative writing to clinical research fields.

### Conclusion

Mixed methods research is appropriate when there are multiple aspects of research that should be examined or when a research problem is not amenable to one type of method only. It offers merit to looking at a research situation from many different angles and means, which when used properly can only provide a more robust consideration of the problem. However in an undergraduate setting it is worthy to consider if the student and the supervisor have the motivation and understanding to commit to applying two differing paradigms. Careful reflection of the theoretical and practical challenges at the earliest possible stage will not only raise awareness of mixed methods (and, by default, qualitative research) in clinical health profession settings, but will also encourage a more rigorous application of both paradigms in the context of the research situation. Finally, a commitment by eager undergraduate students and supervisors to apply mixed methods research will increase the potential for research publications, making the academic and clinical communities more aware of the challenges of applying mixed methods research, hopefully stimulating further debate to enhance the quality of research out-put.

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### Author Note

Sophie Anaf is a PhD candidate specializing in the service potential of emergency department-based physiotherapy. She is a research supervisor, clinical educator and practicing physiotherapist. Please direct correspondence to Sophie Anaf, Discipline of Physiotherapy, School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville, QLD, Australia 4811; Telephone: (+61) 07 4781 6303; Email: Sophie.Anaf@jcu.edu.au

Dr Lorraine Sheppard is a Professor and Associate Professor at James Cook University and University of South Australia, Australia. She specializes in health services research, rural and remote professionals, education, and workforce issues. She can be contacted on (+61)8 8302 2424, Lorraine.Sheppard@jcu.edu.au

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