Developing a framework for critiquing health research: An early evaluation

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S U M M A R Y

A new framework for critiquing health-related research is presented in this article. More commonly used existing frameworks tend to have been formulated within the quantitative research paradigm. While frameworks for critiquing qualitative research exist, they are often complex and more suited to the needs of students engaged in advanced levels of study. The framework presented in this article addresses both quantitative and qualitative research within one list of questions. It is argued that this assists the ‘novice’ student of nursing and health-related research with learning about the two approaches to research by giving consideration to aspects of the research process that are common to both approaches and also that differ between quantitative and qualitative research.

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Introduction

When undertaking an undergraduate programme in nursing, as in many other academic disciplines, students are required to demonstrate the ability to read, understand and critique subject related research reports. Nursing research was at one time guided by the ‘medical model.’ However, though this model remains influential, Polgar and Thomas (2008) suggest that there have been changes in the role and status of health professionals outside of medicine that have brought different perspectives, and require different approaches to research. A more holistic approach now influences how health care is conceptualized, and how research is conducted by nurses, and the methodology of social research has become an accepted part of nursing research. However, this does not mean that nursing students can focus solely on social science methodologies, they also need to be able to understand, evaluate and utilise research that stems from the more positivist approach that has driven (and continues to do so) a significant volume of health research relevant to their practice.

Green and Thorogood (2009, p5) state that “health research includes any study addressing understandings of human health, health behaviour or health services, whatever the disciplinary starting point.” They further suggest that health research may expand knowledge of society and health, or address an existing health care problem. Undergraduates of nursing therefore have to consider health research in its broadest sense.

A common method of assessing understanding both of nursing and the research methodologies utilized within nursing, is the presentation of a detailed critique of a published research report. Our experience in teaching nursing students across a range of programmes and academic levels has taught us how difficult many of our students find this task, and how limited and inaccessible they found many existing analytical tools to be. With the help of funding from the Learning Development Unit we undertook a project to develop, implement and evaluate a research critique framework that nursing students could use as a guide.

This article analyses the content of frameworks and guidelines that have commonly been used by nurses to engage in a critique of a research report and then presents a new framework that has been specifically developed to aid their knowledge and understanding of the range of methodologies relevant to nurses. This new framework is currently being used to assist teaching and learning activities relating to the critical appraisal of published research by our nursing students at both undergraduate and postgraduate level. As such, it is still in the developmental stage and as teachers we continue to reflect on the application of this framework to our teaching. Feedback from students is essential to this development and the article presents formative evaluations from students who have been involved in learning activities during this developmental stage of the framework. This evaluation is on-going and we would welcome comments from our colleagues.

The need for able and competent nurses is self-evident. One way of ensuring competence is through evidence based practice and nurses, like all health professionals, are expected to be intelligent consumers of research, entailing the ability to read, understand and apply published research (Murdaugh et al., 1981). A change of culture arose following the move of colleges of nursing into the higher education sector, resulting in an educational culture where critical enquiry and
evidence-based practice is accorded greater priority (Benton, 2005). Most students are introduced to research methods and critical appraisal during their undergraduate education, however, McCaughan et al. (2002) report that qualified nurses reported problems in interpreting and using research. Valente (2003) highlighted how nurses who had been introduced to a model of essential criteria for analysing sections of a research report could use research to improve patient care.

Work in the field of health and health care is multi-disciplinary and involves a variety of approaches to research. Furthermore the range of such research is wide, from concerns with the relationship between the health needs of a population to aspects of the provision of health services (Bowling, 2009). Government policy and professional guidance insist that professional practice should be based on evidence (Gomm and Davies, 2000).

Given the primacy of the use of evidence in nursing, it is important that students are enabled to critique published research in order to determine the usefulness of that research in their chosen field of work. By ‘critique’ we mean the ability to critically appraise published research by identifying the strengths and weaknesses of the research and forming judgements concerning its overall quality and applicability. Coughlan et al. (2007) and Ryan et al. (2007) have highlighted that the ability to critically appraise research and apply this to the identification of best practice is a key component of nursing practice. The need for nurses to be competent in delivering evidence-based care is explicit in current Nursing and Midwifery Council standards for pre-registration nursing (NMC, 2004) and remain so in the proposed standards for education currently being consulted on (NMC, 2010).

Nursing research, and research that is relevant to nurses, can be of a quantitative or qualitative nature: both research approaches provide valuable information for the discipline of nursing and often complement each other. As a first step in developing a new framework we reviewed what was currently available and accessible to our students.

**Literature review**

Traditionally, many of the available frameworks for conducting critical review were written within the quantitative paradigm, resulting in a tendency to evaluate qualitative research against criteria appropriate for quantitative research (Sandelowski, 1986; Sandelowski and Barroso, 2002). Use of a quantitative framework can thus lead to unjustified criticism of qualitative research, for example, quantitative frameworks for critique will direct students to raise questions concerning reliability and validity, rather than confirmability, dependability, credibility and transferability (Miles and Huberman, 1984). These activities may lead to students appropriating the language of quantitative research when critiquing qualitative research, and can only serve to perpetuate the view of qualitative research as a ‘soft science’ and detract from its value as a research approach in its own right that aims to acquire information that is different from that acquired by quantitative research.

A review of literature that might be readily accessible to nursing students identified various frameworks and sets of guidelines for critical review. In general, these tend to reflect the philosophies of the respective research approaches in that guidelines for quantitative research tend to be in the form of checklists, whereas guidelines for qualitative research tend to be more discursive. However, it is important that approaches to critical review are now acknowledging the value of the two research paradigms, as well as the similarities and differences that arise when conducting critical appraisal. Some authors use separate chapters for critical appraisal of qualitative and quantitative research (LoBiondo-Wood and Haber, 2002; Craig and Smyth, 2007) while others employ different guidelines, or sets of questions, for evaluating the two research approaches, or different research designs (Gomm et al., 2000; Parahoo, 2006; Nieswiadomy, 2008). Several authors provide a separate series of questions for critiquing quantitative and qualitative research, yet there are some questions that are common to the two approaches (Depoy and Gitlin, 2005; Coughlan et al., 2007; Ryan et al., 2007; Moule and Goodman, 2009; Polit and Beck, 2010).

It is possible to detect a trend of moving away from separate frameworks and towards convergence. Ingham-Broomfield (2008) presents a framework that does not intend to separate qualitative and quantitative paradigms, but to assist the user to make ‘broad observations.’ This framework provides a single set of questions that can be applied to any research report, but in doing this in some instances presents the question in a way that might appear to be non-applicable by using terminology that is related to one paradigm rather than both. In a similar vein, Burns and Grove (2007) introduce ‘principles of intellectual research critique,’ which contain 8 broad questions, relating to the significance of the problem, strengths and weaknesses, and the soundness of the chosen methodology. These authors also include generic steps in conducting a research critique, before moving on to separate sets of guidelines for quantitative and qualitative research. In 2009, Burns and Grove published an overview of broad guidelines for conducting critical appraisals of research, including guidance for reading and evaluating the entire study; examining the research; considering the clinical and educational background of the authors and identifying strengths and weaknesses (Burns and Grove, 2009, p602). Again, they then provide detailed separate guidelines for critiquing quantitative and qualitative research. Likewise, Greenhalgh’s (2006) book, aimed at medical professionals, includes a chapter addressing general guidelines for critical evaluation of published research, but also includes separate chapters and checklists for different approaches.

There has been considerable debate concerning whether quantitative and qualitative research can be assessed using the same criteria (Mays and Pope, 2000; Mays et al., 2005), and a developing appreciation that there is a growing presence of qualitative research in medical science (Collinbridge, 2008). Booth (2006) acknowledges the differences between quantitative and qualitative research, but argues that both approaches should pose and answer the same questions:

- What is the message?
- Can I believe it?
- Can I generalise?

(Booth, 2006, p116)

This model appears to follow that of Bowling and Ebrahim (2005) who pose similar questions prior to separating guidelines for quantitative and qualitative research. Johnstone (cited in Booth, 2006) claims that, in the light of the growth in research that employs mixed methods, there is a need to establish a common approach between both quantitative and qualitative research. While there are many criteria that will be common to both research approaches such as the identification of an appropriate question, the choice of an appropriate research design, the conduct of a thorough and relevant literature review, there are also discrete areas of difference. For example, variables are not always given operational definitions in qualitative research as sometimes the aim of the research is to seek definitions of the concepts from the viewpoint of the informants. With this in mind, we set out to develop a research critique framework that could be used by students for both qualitative and quantitative studies.

**Development of a new framework**

Following the review of a range of published critique frameworks, the first step was to develop common features (Table 1). The
strengths of the individual critique frameworks were then identified and this enabled the development of a framework that included areas common to both quantitative and qualitative approaches, plus areas that are specific to each. A diagrammatic framework indicates the pathways that are central to both paradigms and those that are different (Fig. 1).

The framework is supported by guidelines that provide an extended explanation of each item.

It begins with questions that address both quantitative and qualitative studies:

- Does the title reflect the content?
  The title should be informative and indicate the focus of the study. It should allow the reader to easily interpret the content of the study. An inaccurate or misleading title can confuse the reader.

- Are the authors credible?
  Researchers should hold appropriate academic qualifications and be linked to a professional field relevant to the research.

- Does the abstract summarize the key components?
  The abstract should provide a short summary of the study. It should include the aim of the study, outline of the methodology and the main findings. The purpose of the abstract is to allow the reader to decide if the study is of interest to them.

- Is the rationale for undertaking the research clearly outlined?
  The author should present a clear rationale for the research, setting it in context of any current issues and knowledge of the topic to date.

- Is the literature review comprehensive and up-to-date?
  The literature review should reflect the current state of knowledge relevant to the study and identify any gaps or conflicts. It should include key or classic studies on the topic as well as up to date literature. There should be a balance of primary and secondary sources.

- Is the aim of the research clearly stated?
  The aim of the study should be clearly stated and should convey what the researcher is setting out to achieve.

- Are all ethical issues identified and addressed?
  Ethical issues pertinent to the study should be discussed. The researcher should identify how the rights of informants have been protected and informed consent obtained. If the research is conducted within the NHS then there should be indication of Local Research Ethics committee approval.

- Is the methodology identified and justified?
  The researcher should make clear which research strategy they are adopting, i.e. qualitative or quantitative. A clear rationale for the choice should also be provided, so that the reader can judge whether the chosen strategy is appropriate for the study.
  At this point the student is asked to look specifically at the questions that apply to the paradigm appropriate to the study they are critiquing (Table 2). To complete their critique, the final questions students need to address are applied to both quantitative and qualitative studies.

- Are the results presented in a way that is appropriate and clear?
  Presentation of data should be clear, easily interpreted and consistent.

- Is the discussion comprehensive?
  In quantitative studies the results and discussion are presented separately. In qualitative studies these maybe integrated. Whatever the mode of presentation the researcher should compare and contrast the findings with that of previous research on the topic. The discussion should be balanced and avoid subjectivity.

- Is the conclusion comprehensive?
  Conclusions must be supported by the findings. The researcher should identify any limitations to the study. There may also be recommendations for further research, or if appropriate, implications for practice in the relevant field.

**Use of the framework**

The framework is designed to be used both as a teaching tool and as an aid to assessment. One of the motivating factors for producing a framework was to provide clarity and to ensure fairness for those students undertaking a critical review of a research paper for assessment purposes. During our experiences of helping students to perform such critical review we had found that some students had been unable to discriminate between those questions that are appropriate to ask of quantitative research and those that are relevant to qualitative research. We hoped that by placing the questions that are appropriate for the respective research approaches in one single framework we would be able to facilitate the clarification of some of the theoretical positions that inform the respective research approaches and thus, in turn, aid understanding of the need to pose different questions. Thus, the framework can also be used in the classroom for facilitating learning, and as a tool for group activity.

<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research design</td>
<td>Philosophical background</td>
</tr>
<tr>
<td>Experimental hypothesis</td>
<td>Research design</td>
</tr>
<tr>
<td>Operational definitions</td>
<td>Concepts</td>
</tr>
<tr>
<td>Population</td>
<td>Context</td>
</tr>
<tr>
<td>Sample</td>
<td>Sample</td>
</tr>
<tr>
<td>Sampling</td>
<td>Sampling</td>
</tr>
<tr>
<td>Validity/reliability of data collection</td>
<td>Audibility of data collection</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Credibility/confirmability of data analysis</td>
</tr>
<tr>
<td>Generalizability</td>
<td>Transferability</td>
</tr>
</tbody>
</table>

Table 1

Common features of research critique frameworks.

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Fig. 1. Research critique framework.
Experience has demonstrated that it is the practice of critically reviewing a research report that is valuable in the learning process. Small group work provides the student with opportunities for rewarding engagements (Quinn, 1995), it allows students to work independently and to discuss and clarify learning. In small groups students have been provided with both quantitative and qualitative research papers and have used the framework and guidelines to produce their review. Feedback of the review to the larger group allows further discussion and development of knowledge and understanding.

Formative evaluation

The critique framework was used in teaching sessions with two groups of under-graduate nursing and health studies students and one small group of post-graduate students. Nineteen students completed an evaluation form. The aim of this early-stage formative evaluation was to enable us to refine where necessary, especially in relation to any clarification that was seen to be required. The numbers of students responding to particular questions on a 0–5 scale are shown in Table 3. Students were also asked two open questions:

- What did you like most about the framework?
- What did you like least about the framework?

In response to the first question, the responses can be grouped under two headings: ease of use and practical application.

Ease of use

Students liked the presentation of the framework and described it as straightforward, succinct and precise. The fact that it fits on one page was pleasing to the students and there were also comments relating to its simplicity and brevity.

Practical application

Students found the framework easy to follow and understand, describing it as very easy and very helpful. They described the structure and the questions as good and stated that the framework will help them to advance their skills relating to the research process and methods. It was also felt that the framework provides a useful guide for critiquing research.

What did you like most about the framework?

Fig. 1 (continued).
We recognise that the comments presented here represent the contributions of a small number of self-selecting students and there is a need for a more systematic approach to the evaluation of this framework. This will be undertaken as the framework continues to be used in classroom activities with students. However, the current contributions from students do provide some early indications of the potential value of the framework, and enabled us to have the confidence to install on our Virtual Learning Environment (VLE) with some minor changes. Overall, the students found the framework easy to use and useful in terms of covering both quantitative and qualitative research and helpful when carrying out a critique of published research. Student responses to the framework were largely positive, suggesting that it is a useful tool in aiding learning about research and in undertaking a research critique. The undergraduate students who used the framework were required to critique a piece of published research for their assignment in their research methods module and it is evident that they felt that the framework would help them with this task.

Students responded favourably to the questions relating to the features that are common to all research, quantitative and qualitative research. However, in this brief evaluation it was not possible to explore this further, for example, by asking them why their responses were positive or what in particular they found helpful. This will form part of further evaluation as the framework is used more widely.

Once the framework went into general use, we published in our in-house open-access journal (Caldwell et al., 2005), details of its development and use. Thus we opened it up to a larger audience for critique and consideration. We have had an immense amount of interest, not only from colleagues across the University, but also from academics and students both national and international. Students on our professional doctorate programme requested that it was utilised on their programme VLE, which enabled us to expand our vision of this being a tool solely for undergraduate nurses, rather it could be seen to have applicability at different levels and across different related subject areas.

A further quantitative evaluation has subsequently been conducted with thirty three, year three undergraduate nursing students. Thirty three students completed the questionnaire (Table 4). The first question addressed ease of use and 31 (84%) of students scored 3 or above with 0 being ‘not easy’ and 5 being ‘very easy.’ The second question asked how useful it was to have one framework for the two approaches. 27 (82%) scored 3 or above with 0 being not useful and 5 very useful.

The next three questions examined the features of the framework; Over 90% of students felt that framework helped them appreciate the

### Table 2
Questions relevant to quantitative or qualitative research.

<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the design clearly identified and a rationale provided?</td>
<td>Are the philosophical background and study design identified and the rationale for choice evident?</td>
</tr>
<tr>
<td>The design of the study, e.g. survey, experiment, should be identified and justified. As with the choice of strategy, the reader needs to determine whether the design is appropriate for the research undertaken.</td>
<td>The design of the study, e.g. phenomenology, ethnography, should be identified and the philosophical background and rationale discussed. The reader needs to consider if it is appropriate to meet the aims of the study.</td>
</tr>
<tr>
<td>Is there an experimental hypothesis clearly stated and are the key variable identified?</td>
<td>Are the major concepts identified?</td>
</tr>
<tr>
<td>In experimental research, the researcher should provide a hypothesis. This should clearly identify the independent and dependent variables, and state their relationship and the intent of the study. In survey research the researcher may choose to provide a hypothesis, but it is not essential, and alternatively a research question or aim may be provided.</td>
<td>The researcher should make clear what the major concepts are, but they might not define them. The purpose of the study is to explore the concepts from the perspective of the participants.</td>
</tr>
<tr>
<td>Is the population identified?</td>
<td>Is the context of the study outlined?</td>
</tr>
<tr>
<td>The population is the total number of units from which the researcher can gather data. It maybe individuals, organisations or documentation. Whatever the unit, it must be clearly identified.</td>
<td>The researcher should provide a description of the context of the study, how the study sites were determined and how the participants were selected.</td>
</tr>
<tr>
<td>Is the sample adequately described and reflective of the population?</td>
<td>Is the selection of participants described and sampling method identified?</td>
</tr>
<tr>
<td>Both the method of sampling and the size of the sample should be stated so that the reader can judge whether the sample is representative of the population and sufficiently large to eliminate bias.</td>
<td>Informants are selected for their relevant knowledge or experience. Representativeness is not a criteria and purposive sampling is often used. Sample size may be determined through saturation.</td>
</tr>
<tr>
<td>Is the method of data collection valid and reliable?</td>
<td>Is the method of data collection auditable?</td>
</tr>
<tr>
<td>The process of data collection should be described. The tools or instruments must be appropriate to the aims of the study and the researcher should identify how reliability and validity were assured.</td>
<td>The method of data collection should be described, and be appropriate to the aims of the study. The researcher should describe how they have assured that the method is auditable.</td>
</tr>
<tr>
<td>Is the method of data analysis valid and reliable?</td>
<td>Is the method of data analysis credible and confirmable?</td>
</tr>
<tr>
<td>The data analysis strategy should be identified. The tools or instruments must be appropriate for the data involved.</td>
<td>The data analysis strategy should be identified, what processes were used to identify patterns and themes. The researcher should identify how credibility and confirmability have been addressed.</td>
</tr>
</tbody>
</table>

### Table 3
First evaluation of the Framework for Research Critique — undergraduate and postgraduate students.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>How easy was the framework to use?</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = not at all easy; 5 = very easy</td>
<td>1</td>
<td>7</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How useful is it to have a framework covering both quantitative and qualitative research?</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = not at all useful; 5 = very useful</td>
<td>3</td>
<td>13</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As a learning tool, to what extent did the framework help you to appreciate the features that:</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Are common to all research?</td>
<td>2</td>
<td>8</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = not at all; 5 = to a great extent</td>
<td>3</td>
<td>13</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Are specific to quantitative research?</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Are specific to qualitative research?</td>
<td>2</td>
<td>8</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To what extent did the framework help you to carry out a critique of a piece of research?</td>
<td>0 = not at all; 5 = to a great extent</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
features that are common to all research as well as the features that are specific to each paradigm. The last question asked if the framework helped in critiquing research; 30 (91%) of students scored 3 and above with 0 being not at all and 5 being to a great extent.

**Discussion**

While students could be referred to two separate frameworks, and students continue to be able to choose to use separate frameworks, we believe that the incorporation of the two approaches into one framework serves to assist learning and reinforces the differences between quantitative and qualitative research for the ‘novice’ student of research methods, and we have demonstrated the feasibility of producing a user-friendly framework along the lines suggested by Johnstone (cited in Booth, 2006). Following the introduction of this framework to students we have seen an improvement in the relevance and criticality of the students’ commentary when undertaking a research critique when using this, as it has facilitated the clear identification of the research approach and the questions to be addressed associated with the approach as they work through a structured series of questions. Having acquired understanding at an introductory level, advanced frameworks are available for both research approaches when, and if, students require greater depth at a more advanced level of study, although feedback from our postgraduate and doctoral students indicates that the framework can also be successfully utilised at higher levels of study. Unlike some frameworks for research critique, this framework gives equal weight to both quantitative and qualitative research and uses the language of both paradigms, thus minimising the risk that students will be ‘attempting the impossible’ e.g. trying to identify a hypothesis in qualitative research without using a framework and terms originally designed for quantitative research.

Students have reported positively on the experience of using this framework, and academic staff have reported evidence of enhanced learning and improved levels of achievement. Indeed the authors of this paper have noted more positive (often unsolicited) feedback on this teaching/learning tool than on any other we are currently using. We also recognise that it could have relevance outside of nursing, as it is the second most-accessed paper within the University Research Repository.

**Conclusion**

Though the framework and guidelines were initially designed for students working at both level five and six, it has also been found valuable with more advanced students. Those undertaking masters and doctoral level study are frequently given the more complex task of writing a critical literature review in preparation for a research proposal or research report. Those students who have not undertaken academic study for some time find this daunting, and often request revision of key concepts. The framework has proved to be a useful tool in this activity.

For assessment at level two and three, students are frequently required to critically review a paper of their choice. Provision of the framework, with the assessment guidelines, provides a direction for all students. The inclusion of both strategies ensures that whatever the choice of paper all students have guidelines with which to work.

The framework is of value in both teaching and assessment at level five and six, and is also a potentially useful learning aid for students studying at levels seven and eight. It can be used as a teaching tool and displayed on an overhead projector or on PowerPoint, and can also be easily copied as a one page handout for students to work with in the classroom or to take away for study. Further use of the framework is required, but the intention is to place it on WebCT, with the guidelines available as ‘clickable links.’ As such, it will also serve as a revision aid and will allow students to test their own knowledge, clicking on those areas where they feel they need further explanation. The next stage is to facilitate a more systematic evaluation of this framework within nursing, and evaluation across those disciplines outside of nursing that have adopted it.

**References**


