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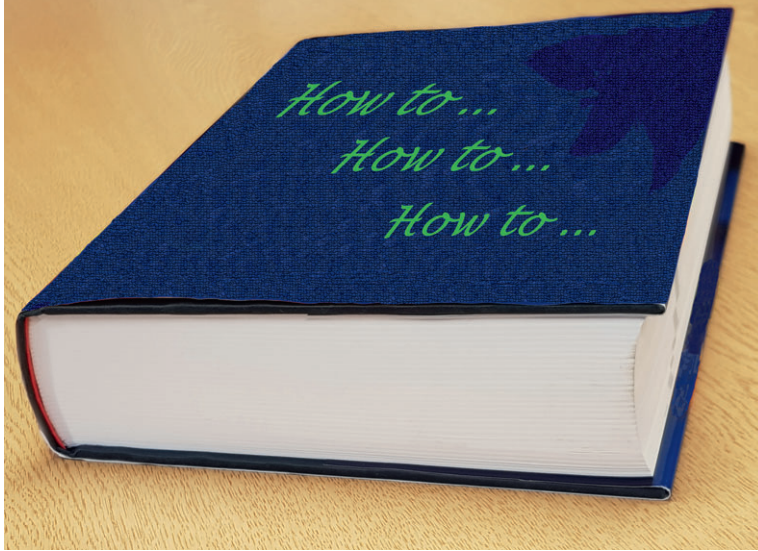
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How to...

How to...write a good research question

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A research question is a question that a research project sets out to answer

SUMMARY

This paper, on writing research questions, is the first in a series that aims to support novice researchers within clinical education, particularly those undertaking their first qualitative study. Put simply, a research question is a question that a research

project sets out to answer. Most research questions will lead to a project that aims to generate new insights, but the target audience and the methodology will vary widely. The term 'evaluation question' is used less commonly, but the same principles apply. The key difference is that evaluation

questions are typically more focused on the immediate context: for example, the effectiveness of an educational intervention in a particular setting. Whether your ambition is for research or evaluation, we hope that you will find this paper helpful for designing your own educational projects.

INTRODUCTION

Most clinical teachers will undertake a research project, evaluate their education practice or prepare a conference poster at some point in their careers. Most clinical teachers will also explore the published literature on a topic relevant to their practice: for example, a teaching innovation, assessment strategy or student support approach. These activities can be enhanced by writing a research question in order to think clearly about what you are doing and why; however, not all clinical teachers have had training in how to write a good research question, and this is not as straightforward as it may seem. Writing questions for qualitative research, in particular, might be new for many health professionals. This article aims to share some tips and frameworks that the authors (medical education researchers who have published quite extensively) have found useful, which we hope will support clinical teachers who are novice researchers in the education sphere, and perhaps provide a helpful refresher for more experienced researchers.

WHAT IS A GOOD RESEARCH QUESTION?

A good question can make people pause and see things in a different way, or can motivate them to learn more through discussion, an internet search or literature review. When a child asks their parents why the sea is blue, the parents may need to consult an information resource before providing a well-informed answer! Thinking critically about everyday taken-for-granted assumptions or practice problems, to enable new potentially transformative viewpoints to be articulated (a process called 'problematizing'), is one of the most useful ways of generating research questions. A good research question will send the

researcher on a quest to identify or collect data that can be analysed and interpreted, such that it provides new insights.

So what are the features of a good question? First and foremost, the question should focus on an important topic. Ask yourself what will happen if this research is not done – does it really matter? Who will benefit from it? Good questions are often co-created with those who may use or benefit from the findings. Look at the priorities identified by journals, funding bodies or priority-setting exercises in the clinical education field to see what others think are important questions.¹ Sometimes new data might prompt a research question: from the findings of a national survey, for example. Other research questions are driven by a theory or hypothesis about what is happening in practice. It is not uncommon for research questions to start out by being quite 'local and particular', focused on the immediate educational context, but they can often be developed into questions with broader relevance.

Good research questions are usually quite narrow or specific, but often do not start out that way. You might start with a general theme or idea for research (e.g. motivation for learning), which develops into a more specific question over time (e.g. how do medical school graduates engage with e-learning resources outside their working hours?). Novices often ask very broad questions, but these are unlikely to be answered in a short time frame and can lack direction and impact.² After developing a research question, you will need to consider whether it can be answered through the existing published literature or whether new data must be collected. Reviewing the literature is only manageable if the question has clear boundaries. In

research, we are often contributing a tiny step to the existing knowledge, rather than making huge leaps. Small contributions are better than no changes at all. So a long, specific question is likely to be preferable to a short vague question.

To illustrate these points Table 1 provides some specific examples, and in the next section we discuss some key considerations.

CONSIDERATIONS: RELEVANCE, ORIGINALITY AND RIGOUR

Here, we highlight some things to think about as you develop your research question, building on the points raised above. These analyses are not intended to be undertaken in any specific order. The considerations fall into three main categories (Figure 1), which can be thought of as broadly concerning the relevance, originality and rigour of the research question, and which are interrelated and partly inspired by the UK Research Excellence Framework.³ You may start with any one of the categories and revisit each one multiple times. In doing so, you may change your research question slightly or completely. Don't be disheartened if you go through many iterations; time spent on this process is always well invested.

Relevance

Begin by identifying and articulating the important societal or practice problem that you wish to research. To consider the significance of the research question for different audiences, try articulating the problem in multiple ways, perhaps working with different stakeholders from the clinical education field to do this (Box 1). Talk about your project idea in lay terms and observe people's reactions with an open mind. The process will require you to think clearly and from different perspectives.

Ask yourself what will happen if this research is not done - does it really matter? Who will benefit from it?

Ensure that the research question will lead to original work that generates new insights

Table 1. Examples of research questions in clinical education

Research question	Source	Our comments
How do people learn?	Created by the authors	Too broad! The question spans many disciplines (education, psychology, sociology, anthropology) and the answer is likely to depend upon the 'people' studied.
Do postgraduate trainees like lectures? An interview study.	Created by the authors	Not aligned! The question demands a yes/no answer, but the methodology will provide words as data. The question also focuses on learner satisfaction, but could be developed to consider knowledge gain or behaviour change.
How can we increase the number of applications for a fixed number of medical school places?	Created by the authors	This question is only important if there are insufficient high-quality applicants to fill the places. Its importance could be increased significantly by focusing on particular demographic groups who are underrepresented at medical school.
What interactional structures are used in feedback sequences during general practice bedside teaching encounters?	Rizan et al. (2014) ¹⁴	The importance of this research question for clinical education is clear. This is a question that is probably better suited to data in the form of words.
How does cognitive empathy specific to the doctor-patient relationship, as assessed in much of the previous work, change over the course of medical school?	Smith et al. (2017) ¹⁵	This long, specific question explicitly builds on previous work and is probably better suited to quantitative data collection. In PICO terms, the population represents medical students, the intervention is a medical school, the comparison is between students at the beginning and end of medical school and the outcome is cognitive empathy.

PICO: patient, intervention, control/comparison, outcome.

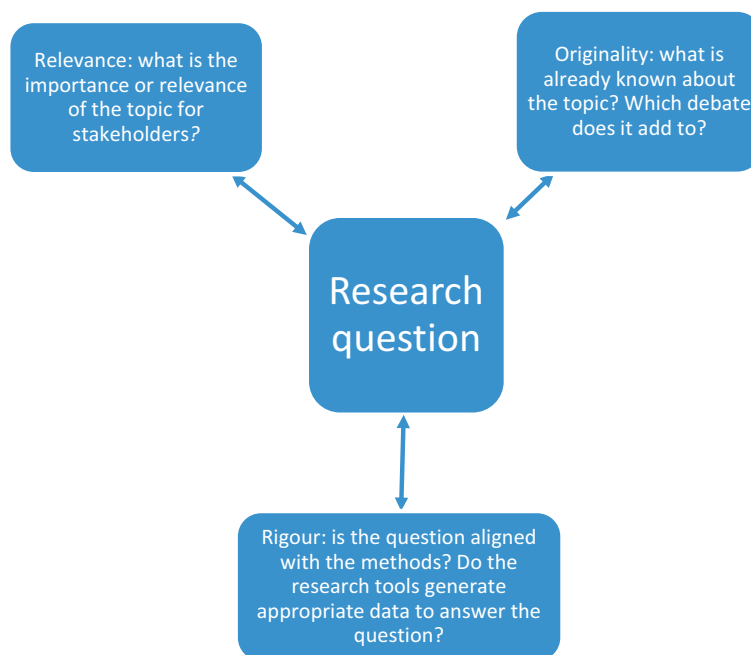


Figure 1. Three interrelated elements of research question development

Originality

Another key consideration is to ensure that the research question will lead to original work that generates new insights and does not duplicate previous research, which can be determined through a literature review. There are many different approaches to literature reviewing,⁴ so you can tailor this to the purpose. If you can find an existing research study or review article on your topic of interest that answers (or partially answers) the question you are trying to define, then you may not need to do the study you had first envisaged. This is good news, as your time can now be spent extending that work and contributing to knowledge, rather than unintentionally duplicating what is already known.

Box 1. Examples of stakeholders in clinical education

- Teachers and learners in health care disciplines
 - o undergraduate
 - o postgraduate
 - o continuing professional development
- Patients and the public
 - o of all ages and demographic groups
 - o in hospital and community settings
 - o individually and through patient groups
- Policy makers
- Organisations
 - o universities
 - o hospitals
- Health care systems

Once you have identified the problem that you wish to research and know what research has already been undertaken, you will be able to articulate the gap in the literature that you wish to address. Lingard's paper on 'Problem, Gap, Hook', which suggests articulating a current problem, highlighting an important knowledge gap and convincing the audience that this gap is problematic, is a useful way of thinking about this.⁵

Rigour

Ensuring that the research question and methods of data collection and data analysis are aligned is a key element of rigour. Research questions may suggest a particular type of answer. For example, some questions demand a yes or no answer, some require a number or a ranking as an answer, and some may be better answered with data in the form of words. It is worth noting that different people may be drawn to particular types of question: some favour 'What', and some favour 'Why' or 'How', and these preferences are shaped by their knowledge and prior experiences. Generally, questions focusing on experiences, viewpoints, group processes and personal development tend to lend themselves better to qualitative research.⁶

Questions may also be shaped by researchers' preferred methodological tools, which are inevitably interlinked with the way that they see the world:⁷ for example, whether they have a qualitative or quantitative orientation. Talk to fellow researchers. What kind of study design would they anticipate from this question? What kinds of theories and methodologies might be useful in answering this question? Even towards the end of your research project, when drawing conclusions, refer back to the research question to ensure the coherence of the study.

TIPS FOR WRITING YOUR RESEARCH QUESTION

When drafting your research question, there are some useful frameworks that you can use to help you think clearly about what you are doing and about the components of your research question. Readers might be familiar with Kirkpatrick's model for evaluating learning and the expanded version described by Barr et al., which considers different types of education outcome that may be explored.^{8,9} Much clinical education research to date has focused on learner

satisfaction, but it is possible to design research that considers knowledge gain, behaviour change or patient outcomes. Bloom's taxonomy is useful for thinking about the descriptors used in relation to educational outcomes.¹⁰ Readers might also be familiar with the PICO (patient, intervention, control/comparison, outcome) framework,¹¹ with SPIDER (sample, phenomenon of interest, design, evaluation, research type) providing a qualitative alternative.¹² The SPIDER framework can help to spell out the key elements of a question for qualitative work.

Once you have started your research project, revisit the research question regularly. Some projects evolve and drift during the study, and ultimately do not answer the research question. It is easy to lose sight of the question in the midst of the all-absorbing research process. Different elements of research need constant realignment with each other and Agee reminds us that this is critical to the shaping of research studies, particularly qualitative studies.¹³ Keep the research question foremost in your mind throughout the process.

CONCLUSION

A good research question takes time to create, but time invested in this process is always worthwhile.

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