Teaching and learning theories, and teaching methods used in postgraduate education in the health sciences: a scoping review protocol

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Review objectives/questions: The objective of this scoping review is to determine the theories of teaching and learning, and/or models and/or methods used in teaching in postgraduate education in the health sciences. The longer term objective is to use the information gathered to design a workshop for teachers of postgraduate students. The question that this review seeks to answer is: what theories of teaching and learning, and/or models and/or methods of teaching are used in postgraduate teaching?

Keywords: graduate pedagogy; innovation in education; medicine; models; nursing


Background

Undergraduate teaching has received considerable attention in literature in terms of methods used, innovative ideas and outcomes.¹ The same cannot be said of postgraduate education.¹ Postgraduate education refers to further study after completion of a bachelor’s degree and in the health sciences generally means that the graduate goes on to further study, specializing in a particular field of study within that health science discipline. For most disciplines, this further study is at a postgraduate diploma or masters level. Teaching at graduate level in the health science disciplines is a complex endeavor, as higher level knowledge, skill acquisition and decision making must be taught in a world which is seeing more complex and varied health problems. Postgraduate medical education mainly takes place in the workplace, often in the form of “informal learning”.²

There are a number of differences in teaching at the postgraduate (also referred to as graduate) level. First, the students are generally more mature and have chosen to specialize in an area of their discipline. Second, it is assumed that because they have chosen this specialization they are more motivated to learn. Third, because the number of students is generally smaller than in undergraduate courses, teaching is usually small group or one-on-one teaching, often in a practice environment.

Clifton et al.³ and Sadideen et al.⁴ comment on the shorter working week for postgraduate students in medicine and how this has impacted on education, despite the increased complexity of cases seen in practice. In the USA, a restricted work week came into force around 2008. The impact of this restriction on experience has been reported on by Drake et al.⁵ They found a 25–30% decrease in operative experience over a five-year period. The adage of “see one, do one, teach one”, while still used, is not acceptable in the current climate.³⁴ Clifton et al.³ notes the development of competency-based assessment methods as a “novel training method.” The concept of competence dates back to Miller, who in 1990 described the four-level triangular hierarchy of “knows,” “knows how,” “shows how” and “does”.⁴ Sadideen et al.⁴ argue that this hierarchy appears to assume that competence predicts performance, when in reality, several other factors in the workplace can influence performance. More recently, the Canadian Medical Education Directions for Specialists model⁶ has outlined core competencies, together with entrustable professional activities. This model has been used and adapted by several health science professions. However, there are
those who argue that teaching for the health professions cannot be reduced to a list of competencies. The complexity of health problems being seen globally and the new technologies and techniques being developed bring with them a number of ethical concerns. Increasingly, it is being recognized that it is unethical to expect patients to be used for learning new skills and learning complex skills on patients is unethical. Although high-fidelity simulation learning environments provide safe learning opportunities for students to learn and practice skills, they need to be used thoughtfully and with conscious intent of learning outcomes. 

The restriction on the number of hours worked per week does not apply in the current context, but the old adage of “see one, do one, teach one” is still heard in conversations about teaching. The Canadian Medical Education Directions for Specialists competencies have been modified for the current context. They are called the “Core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa”. No studies were found reporting on how these competencies are being taught in the current context.

Dijkstra et al.7 argue that consideration of educational innovations and competencies are but two factors that need to be accounted for in preparing graduate students for further practice. They state that according to social cognitive theory, self-efficacy is a predominant factor that influences behavior. Others have reported on the importance of the learning environment in graduate education. The workplace as a learning environment defines learning opportunities through its activities, structures, participatory nature and sociopolitical mediations. 2

There are several theories of learning that teachers need to consider in their teaching. These theories may be considered at the level of knowledge acquisition, skill development and reflective practice. Vygotsky12 coined the term “zone of proximal development”. This refers to the range in which the learner can develop if she/he has the opportunity to interact with more capable peers – referred to as “more knowledgeable others”. A concept that may be closely aligned to this concept of more knowledgeable others is Wenger’s “community of practice”. There are three distinct dimensions to the community of practice: mutual engagement, a joint enterprise and the shared repertoire.13 Schön’s work in reflective practice may be a theory that is pertinent in teaching decision making and Kolb’s15 experiential learning cycle may be used in the teaching of psychomotor skills.

Mezirow16 maintains that adult learning needs to emphasize contextual learning, reflect critically on assumptions and validate meaning by assessing reasons. In transformative learning, he believes that it is crucial that learners become critically aware of their own tacit assumptions and expectations and those of others and assess their relevance for making an interpretation. Mezirow16 goes on to speak of “mindful learning”, a concept defined by Langer17 as the openness to new information and an awareness of more than one perspective. Mezirow states that transformative learning is “a process whereby we transform our taken-for-granted frames of reference…”. These frames of reference may also be called meaning perspectives, habits of mind or mindsets. Our frames of reference or habits of mind result in points of view and consequently our beliefs. Our habits of mind can be challenged and may result in a change of point of view.

The scoping review has been prompted by the reviewers’ personal experiences. When conducting teaching workshops for faculty, it has been noted that several participants have requested help in teaching at the postgraduate level. This triggers questions such as: what is the aim of graduate education? What are the expectations of teachers of graduate students and students? Why are teachers making this request for assistance? In an era of curriculum transformation, what should teachers be doing to enhance knowledge transfer and thought? The program for graduate study is often left to clinician-teachers who have no educational background. Swanwick2 argues that postgraduate medical educators have adopted a cognitive approach to teaching and that programs for educators have first focused on andragogy, experiential learning and reflection, and second on the apprenticeship model with the teacher as master and role model.

Therefore, data gathered in this scoping review will inform faculty development through workshops, identifying the most common theories of teaching and learning used in postgraduate teaching, and the application/use of teaching methods and identification of any other concepts important in graduate teaching that faculty teaching staff should consider in their curricula development and teaching
practices. Information will be disseminated through publication and conference presentations.

The following databases have been searched for an existing scoping review dealing with this topic and none was found: Cochrane, Prospero, Scopus, ERIC and the JBI Database of Scoping reviews and Implementation Reports.

**Inclusion criteria**

**Participants**

Participant details will not be used as the basis for study selection in this review concept.

**Concept**

The concept examined by this scoping review is graduate/postgraduate teaching and education and theories of teaching and learning on which these teaching methods are based. Theories will be identified by a statement in the publication that a specific theory, for example, Piaget or Vygotsky, has been used.

**Context**

The scoping review will consider studies that have been conducted in the health science disciplines, including but not limited to medicine, nursing, occupational therapy, physiotherapy, pharmacy and dentistry.

**Study types**

The scoping review will consider both quasi-experimental study designs, including before and after studies and interrupted time-series studies. In addition, analytical observational studies, including prospective and retrospective cohort studies, analytical cross-sectional studies will be considered for inclusion. This review will also consider descriptive observational study designs, including case reports, surveys and descriptive cross-sectional studies.

Qualitative studies will also be considered that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, qualitative description and action research.

Text and opinion studies will also be considered for inclusion in this scoping review. This will include discussion studies and commentaries.

**Search strategy**

The search strategy will aim to find both published and unpublished studies. An initial limited search of MEDLINE has been undertaken to identify articles on this topic, followed by analysis of the text words contained in the titles and abstracts, and of the index terms used to describe these articles. This informed the development of a search strategy, including identified keywords and index terms which will be tailored for each information source. A full search strategy for PubMed is detailed in Appendix I. The term “teaching” is being used as this review is limited to teaching methods. The reference list of all included studies will be screened for additional studies.

Studies published in English will be included. Studies published from 2001 to the present will be considered. This 16-year period has seen many innovations in education, such as the flipped classroom, the development of competencies for health professionals and great strides in e-learning.

The databases to be searched include:

- PubMed
- Cumulative Index of Nursing and Allied Health Literature (CINAHL)
- Scopus
- Educational Resources Information Centre (ERI through EBSCO Host)

The search for unpublished studies will include:

- ProQuest Nursing and Allied Health Source and ProQuest Health and Medical Complete.

**Data extraction**

Data will be extracted from studies included in the scoping review by two independent reviewers using the draft data extraction tool listed in Appendix II. The data extracted will include specific details about the populations, concept, context and study methods of significance to the scoping review question and specific objectives. The concept in this review includes theories of teaching and learning, and teaching methods. Data extracted will include the name of the theory, for example, Piaget or Vygotsky (where stated) on which the teaching method has been based. Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer. Authors of studies will be contacted to request missing or additional data where required. The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included study. Modifications will be detailed in the full scoping review report.
Presenting the data
The extracted data will be presented in diagrammatic or tabular form in a manner that aligns with the objective/s and scope of this scoping review. The charting table will report on: distribution of studies by year of publication, countries of origin, study design, research methods, the study sample in terms of health science discipline, the teaching strategy studied and the key findings/outcomes. In terms of the latter, where only the teaching strategy is described, outcomes may be not applied. A narrative summary will accompany the tabulated and/or charted results and will describe how the results relate to the reviews objective and question/s.

Acknowledgements
The assistance of Chay Ford (librarian) for help in developing the search strategy and doing an initial search of PubMed is acknowledged.

References
Appendix I: Search strategy

PubMed, CINAHL, Scopus, Eric (through EBSCO Host)
1. graduate* OR postgraduate* 
2. education* OR pedagogy OR pedagogical OR teaching
3. medicine OR medical OR nursing OR nurse* OR dental OR dentistry OR dentist* OR “occupational therapy” OR “occupational therapist” OR “physical therapy” OR “physical therapist” OR physiotherap* OR pharmacist* OR pharmacy
4. model OR models OR method* OR theor*
5. innovation* OR trend*
6. #1 AND #2
7. #3 AND #6
8. #4 AND #7
9. #5 AND #8
10. #9 AND English
11. #10 AND Publication Date from 2000/01/01 to 2015/12/31
Appendix II: Draft study details, characteristics and data extraction instrument/s

<table>
<thead>
<tr>
<th>Study No.</th>
<th>Authors</th>
<th>Year of publication</th>
<th>Country of origin</th>
<th>Study design</th>
<th>Study population (discipline)</th>
<th>Teaching theory used</th>
<th>Teaching method employed</th>
<th>Key findings</th>
</tr>
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