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Review

Factors related to self-directed learning readiness of students in health professional programs: A scoping review

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ABSTRACT

Background: Academic and professional drivers have stimulated interest in self-directed learning of students in pre-certification health professional programs. Particular attention has focussed on factors which may influence a students' readiness for self-directed learning.
Method: A five stage structured scoping review of published literature was conducted to identify measures of self-directed learning readiness used with students in pre-certification health professional programs and those factors that have been investigated as potential determinants. Relevant articles were identified in six databases using key search terms and a search strategy. Two independent reviewers used criteria to cull irrelevant sources. Articles which met eligibility criteria were charted.
Results: The final analysis included 49 articles conducted in nursing, medicine, physiotherapy, pharmacy, occupational therapy and dentistry cohorts. Twenty-one potential determinants had been investigated with gender, year level, age program delivery and previous education level the most common. Self-directed learning readiness has been of interest globally, mostly in medicine and nursing, and studies have nearly exclusively used one of two instruments.
Conclusion: There is nascent evidence that age, year level and previous education level may have positive influence. These factors have in common the passing of time and may in fact be proxy for more encompassing developmental or social constructs. Further research is needed particularly in the allied health professions where there is limited research in very few disciplines. Studies in interprofessional contexts may be an efficient approach to increasing the knowledge base. Further work is also warranted to determine appropriate use of the two instruments across the range of health disciplines.

1. Introduction

Pre-certification health professional programs commonly adopt adult learning approaches, differing from the pedagogical models of teaching and learning used in secondary (high school) education. One key premise of adult learning models is that learners are self-directed in their approach to learning (Knowles, 1975). Knowles defines this self-directed learning as "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18).

Professional behaviours such as reflective, evidence-based and lifelong learning practices to maintain knowledge currency assume that graduates entering the workforce already have the ability to direct their own learning. In consequence, the readiness of students, graduates and experienced practitioners for self-directed learning has been the subject of research enquiry. Wiley identified this as "the degree (to which) the individual possess the attitudes, abilities and personality characteristics for self-directed learning" (Wiley, 1983, p. 182). While some studies (Chiang et al., 2013; Lunyk-Child et al., 2001; Premkumar et al., 2013; Pryce-Miller, 2010) have explored students' self-directed learning readiness through qualitative or mixed method approaches, most have adopted quantitative approaches using standardized instruments.

The Self-Directed Learning Readiness Scale (SDLRS) (Guglielmino, 1978) was the first instrument to measure self-directed learning readiness. More recently, several other instruments have been developed: Oddi's Continuing Learning Inventory (OCLI) (Oddi, 1986); Ryan's two part self-assessment questionnaire (Ryan, 1993); the Self-Directed

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Learning Readiness Scale for Nursing Education (SDLRSNE) (Fisher et al., 2001) and the Self-Directed Learning Instrument (SDLI) (Cheng et al., 2010). Although developed as a learning resource, the self-report Competencies of Self-Directed Learning (Knowles, 1975) has more recently been used as a measure.

To date no study has examined the literature to identify what is known about measures of self-directed learning readiness or factors that have been investigated as potentially associated with it. This study aims to map previous research using quantitative methods to identify the standardized measures used to investigate readiness for self-directed learning and factors investigated as potentially or actually associated with it. The study is restricted to research investigating students in pre-certification health professional programs.

2. Method

A scoping review design was adopted to collect, summarise and chart the existing literature on the topic of self-directed learning readiness of students in pre-certification health professional programs. The Arksey and O'Malley (2005) five-stage framework was used: (1) formulating the question, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing and reporting the results. In addition, the design was refined using Levac et al. (2010) recommendations on the Arskey and O'Malley framework; specifically the process for study selection and the process for collating, summarizing and reporting the results. Scoping reviews allow for broad exploration of an issue and will often report on the "volume, nature and characteristics of the primary research" (Arksey and O'Malley, 2005, p. 30). This differs from a systematic review which focuses on a specific question and typically assesses the quality of the studies included.

2.1. Stage 1: Formulating the Question

The focus of this scoping review was to explore the self-directed learning readiness of students in pre-certification health professional programs and factors proposed to affect it. The research question which guided the study was 'What factors have been investigated in studies examining self-directed learning readiness of students in pre-certification health professional programs?'. For the purposes of this study, *health professional* disciplines included medicine, nursing, midwifery, dentistry and allied health professions.

In the absence of a definitive agreement, nationally or internationally, as to which professions are considered allied health professions, the researchers used the Australian Health Workforce Advisory Committee (2006) definition which includes the following 12 professions: audiology, dietetics and nutrition, occupational therapy, orthoptics, orthotics and prosthetics, pharmacy, physiotherapy, podiatry, psychology, radiography, speech pathology and social work.

2.2. Stage 2: Identifying Relevant Studies

Key search terms and a search strategy were developed to investigate the research question, and were reviewed by a librarian to increase rigor. The search terms, presented in Table 1, were used in the following databases: CINAHL, PsychINFO, MEDLINE, ERIC, Scopus, and Web of Science. The review was limited to journal articles written in English. Grey literature was excluded from this scoping review. The search retrieved 351 articles across the six databases, which was reduced to 199 once duplicates were removed. Articles not published in English and not published in peer reviewed journals were also removed, reducing the number of articles to 118.

2.3. Stage 3: Study Selection

The selection process is shown in Fig. 1, using the preferred reporting items for systematic reviews and meta-analyses (PRISMA) flowchart (Moher et al., 2009). The authors independently reviewed abstracts of the 118 articles identified in the database search against the following inclusion criteria, decided *a priori*:

(1) studies which included students in one or more of the health disciplines defined above
(2) studies including students in pre-certification programs (either undergraduate or graduate entry programs)
(3) studies where self-directed learning readiness was a primary outcome variable
(4) quantitative studies using a standardized instrument to measure self-directed learning readiness

Studies where the primary purpose was to explore psychometric properties of self-directed learning measures were excluded from this scoping review.

The authors independently screened 118 articles and then reviewed full-text versions of 60 articles to confirm eligibility for inclusion. The authors met to discuss one study where there was rater disagreement. The full text was re-read and a consensus agreement reached. At the end of the selection process, 49 studies met inclusion criteria.

2.4. Stage 4: Charting the Data

A table reporting the author, year, disciplines, instrument used and sample size of each study is included (Supplementary material). This table charts the factors investigated and any significant results in the included articles. To assist in study comparison, factors were grouped into: demographic, educational, program, academic and professional factors.

2.5. Stage 5: Collating, Summarizing and Reporting the Results

A summary of study characteristics is presented in Table 2, an analysis of instruments used by discipline is presented in Table 3 and a summary of the factors investigated is presented in Table 4. Interpretation of the findings is presented the discussion section of this scoping review.

3. Results

Characteristics of included studies are reported in Table 2. The 49 included studies were conducted across 15 countries; most in the United States of America (20.4%), Canada (12.2%) and the United Kingdom (12.2%). Students in nursing cohorts (42.6%) followed by medicine (31.5%) were most common. While publication dates ranged from 1983 to 2016, only five studies pre-date 2000. These five studies were

Table 1
List of search terms used.

Discipline	Undergraduate students	Self-directed learning readiness
(Medical OR medicine OR nursing OR midwifery OR dental OR dentistry OR allied health OR health science* OR audiology OR dietetic* OR nutrition* OR occupational therapy OR orthoptic* OR orthotic* OR prosthetic* OR pharmacy OR physiotherapy OR physical therapy OR podiatr* OR chiropody OR psychology OR radiography OR speech pathology OR speech therapy OR speech and language therapy OR social work) AND	(Undergraduate OR graduate OR university OR student*) AND	(Self-directed learning readiness OR self directed learning readiness)