



Review

The evidence for ‘flipping out’: A systematic review of the flipped classroom in nursing education



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ARTICLE INFO

Article history:

Accepted 14 December 2015

Keywords:

Nursing
Education research
Flipped classroom
Higher education
Problem-based learning

SUMMARY

Background: The flipped classroom has generated interest in higher education providing a student-centred approach to learning. This has the potential to engage nursing students in ways that address the needs of today's students and the complexity of contemporary healthcare. Calls for educational reform, particularly in healthcare programs such as nursing, highlight the need for students to problem-solve, reason and apply theory into practice. The drivers towards student-based learning have manifested in team, problem and case-based learning models. Though there has been a shift towards the flipped classroom, comparatively little is known about how it is used in nursing curricula.

Objectives: The aims of this systematic review were to examine how the flipped classroom has been applied in nursing education and outcomes associated with this style of teaching.

Data Sources: Five databases were searched and resulted in the retrieval of 21 papers: PubMed, CINAHL, EMBASE, Scopus and ERIC.

Review Methods: After screening for inclusion/exclusion criteria, each paper was evaluated using a critical appraisal tool. Data extraction and analysis were completed on all included studies.

Results: This systematic review screened 21 titles and abstracts resulting in nine included studies. All authors critically appraised the quality of the included studies. Five studies were identified and themes identified were: academic performance outcomes, and student satisfaction implementing the flipped classroom.

Conclusions: Use of the flipped classroom in higher education nursing programmes yielded neutral or positive academic outcomes and mixed results for satisfaction. Engagement of students in the flipped classroom model was achieved when academics informed and rationalised the purpose of the flipped classroom model to students. However, no studies in this review identified the evaluation of the process of implementing the flipped classroom. Studies examining the process and ongoing evaluation and refinement of the flipped classroom in higher education nursing programmes are warranted.

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Introduction

The flipped or inverted classroom has generated considerable interest in higher education. The flipped classroom provides a student-centred approach to learning that has the potential to engage nursing students in ways that address the needs of today's students and the complexity of contemporary health care. The need to reform the

pedagogical approach in nursing education has been highlighted previously in nursing education. Benner calls for transformation, wherein students engage as active learners, content is taught in-context, and educators facilitate clinical reasoning and critical thinking rather than imparting factual information (Benner et al., 2009).

The flipped classroom involves a reversal of traditional teaching where:

Students gain first exposure to new material outside of class, usually by reading or lecture videos, and then class time is used to do the harder work of assimilating that knowledge through strategies such as problem-solving, discussion or debates. (Brame, 2013, p. 1).

This paper examines the evidence for flipping the classroom in nursing programmes in higher education and the outcomes associated with this approach to teaching and learning.

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Background

For decades, universities have recognised that students undertaking higher education are adult learners and therefore require an andragogical approach. The core tenets of andragogy incorporate self-direction, self-motivation, and active learning (Knowles, 1975, 1990). Despite espousing an andragogical model, much nursing education pedagogy relies on a traditional didactic approach whereby academics transmit knowledge as expert teachers to students. The limitations of this transmittal model of teaching are that students are not actively engaged in processing information, developing understanding or translating knowledge into practice (King, 1993). Under this traditional pedagogy, students have been treated as empty vessels passively absorbing information; wherein their interests are diminished and diverse learning styles are disregarded (Lage et al., 2000). Calls for educational reform, particularly in healthcare programmes such as nursing, highlight the need for students to problem-solve, reason and apply theory into practice (Barnett et al., 2012; Martyn et al., 2014). Equipping students with the skills to critique information is viewed as paramount (Applin et al., 2011) and consistent with learning theorists including Biggs and Tang and Bloom's higher order learning (Anderson et al., 2001; Biggs and Tang, 2011).

To mitigate the limitations of the transmittal model of education, there has been a shift towards student-centred learning and engaging students as active learners (Applin et al., 2011; Della Ratta, 2015; Towle and Breda, 2014). The increasing fiscal pressures on higher education and parallel advancements in educational technology have spawned a push to flexible delivery, online delivery and blended learning (O'Flaherty and Phillips, 2015) which are consistent with a student-centred approach. These drivers towards student-based learning have developed in team, problem and case-based learning models (Applin et al., 2011; Martyn et al., 2014).

The notion of higher education being student-centred and students being actively engaged warrants a notable shift in roles and how time and space are utilised. First, this change requires a cultural shift in paradigm from academics being the facilitators of knowledge to the curators of knowledge (Brooks, 2015); and facilitators of knowledge translation. Second, a student-centred approach values and supports a diversity of learning styles (Lage et al., 2000; Towle and Breda, 2014). Third, students will be required to take a more active role and be accountable for their learning (Blaschke, 2012). Students, including the millennial generation are well situated to capitalise on flexible, multi-media learning opportunities (Kiteley and Ormrod, 2009; Towle and Breda, 2014).

The shift to providing student-centred learning has coincided with the recent surge in flipped classroom curricula in higher education (Bernard, 2015; O'Flaherty and Phillips, 2015). Despite the uptake of the flipped classrooms in other disciplines there is a dearth of evidence available about the use in nursing curricula (Bernard, 2015; Schlairet et al., 2014).

AIM

The aims of this systematic review are to examine the best possible evidence of how the flipped classroom has been applied in nursing education and outcomes associated with this style of teaching.

Methods

Search Strategy

In July 2015, a systematic search was conducted of the electronic databases PubMed, Excerpta Medica, (Embase), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Educational Resources Information Center (ERIC) and Scopus. Boolean operators AND/OR/NOT were used to combine search terms including: nursing; nurse*;

flip*; curriculum; active learning; blended learning; classroom; problem-based learning; teaching and education.

The search strategy was limited to papers published in English. All search results including titles and abstracts were downloaded into Endnote X7 for review. Duplicates were removed. The references of potential papers were examined to identify additional papers fulfilling the inclusion criteria that may have been missed by the search strategy. Full texts of all potential papers were downloaded for review.

Inclusion and Exclusion Criteria

Studies included were peer reviewed reports of primary research that investigated the use of the flipped classroom for nursing students undertaking higher education. Studies were excluded if they involved nurses in clinical settings and professional development. Review articles, commentaries, editorials, grey literature and letters were also excluded.

Search Outcomes

Forty two references were downloaded into EndNote X7. After the removal of duplicates the 21 residual references were reviewed for relevance based on the title and abstract. In the case of any discrepancies concerning the inclusion of a paper, the full article was downloaded and assessed for suitability by all authors. Subsequently, 18 full text papers were retrieved and reviewed of which nine were excluded based on the inclusion/exclusion criteria.

Each of the nine remaining papers was then critically appraised utilising the 11 quality indicators (Table 1), specified by Buckley et al. (2009). These indicators relate to appropriateness of study designs, methods, analysis, results and conclusions. Studies that met seven or more of the 11 indicators were considered to be of higher quality and therefore included in the review (Buckley et al., 2009). All nine papers were scored individually by the authors and any discrepancies were discussed until consensus was attained. Based on the quality appraisal, four articles were further removed. On completion, five studies met the inclusion criteria and were of a suitable standard for this systematic review (Fig. 1).

Data Extraction

All authors contributed to the extraction and categorisation of data. Data included author(s)/year of publication, country of origin, aim of study, design, sample and study population, data collection, methods of analysis and reported outcomes (Table 2). Data describing the flipped classroom interventions were also captured including course type, frequency, pre-class preparatory strategies and within-class active learning strategies (Table 3). Patterns were identified, categorised into themes, summarised and systematically synthesised.

Table 1

Quality indicators developed by Buckley et al. (2009).

Quality indicator	Questions pertaining to rigor of study
Research question	Is the research question(s) or hypothesis clearly stated?
Study subjects	Is the subject group appropriate for the study being carried out?
Data collection methods	Are the methods used reliable and valid for the research question and context?
Completeness of data	Have subjects dropped out? Is the attrition rate less than 50%? Is the questionnaire response rate acceptable?
Control for confounding	Have multiple factors/variables been removed or accounted for where possible?
Analysis of results	Are the statistical or other methods of results analysis used appropriate?
Conclusions	Is it clear that the data justify the conclusions drawn?
Reproducibility	Could the study be repeated by other researchers?
Prospective	Does the study look forward in time rather than backward
Ethical issues	Were all relevant ethical issues addressed?
Triangulation	Were results supported by data from more than one source?

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