

Systematic Review

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Blended learning and health professional education: Protocol for a mixed-method systematic review

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Abstract:

Blended learning (BL) refers to a systematic teaching method, which combines the aspects of face-to-face and online interactions using appropriate Information and Communication Technologies. This mixed-method systematic review (SR) protocol is developed with the objective to determine the effectiveness and appropriateness of BL in the health-care professional education. Mixed-method SR protocol: For the purpose of this SR, PICO is defined as P-entry level graduate students of health sciences program; I-BL; C-traditional face-to-face training; and O-achievement of learning outcomes, learner's and teacher's perception (primary). The search will be done through possible database using predetermined search strategy. Eligible studies will be appraised independently by authors. Joanna Briggs Institute's mixed-method protocol will be used to assess and synthesis the data. This protocol is registered with the International Register of Systematic Reviews (PROSPERO) with the registration number CRD42018082699.

Keywords:

Blended learning, health professional education, mixed method, systematic review

Introduction

The current generation of learners has been identified as digital natives, as they are growing in the digital environment. This digital environment and the associated culture have altered the thinking and learning process of this generation compared to the previous. Digital natives prefer receiving information quickly; are expert at processing information quickly; prefer multitasking and nonlinear access to information; have a low tolerance for lectures; prefer active rather than passive learning, and rely heavily on communications technologies to access information and to carry out social and professional interactions.^[1]

Internationally, higher education is transmuting to meet the learning demands of the current generation.^[2] Online support

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to enhance the learning experience is made easier by digital technology and the worldwide web,^[2] with one of the methods used to improve active learning being blended learning (BL). BL refers to a systematic teaching method, which combines the aspects of face-to-face and online interactions using appropriate Information and Communication Technologies.^[3]

Active learner's participation, maximal utilization of student learning time, peer-learning, and self-reflection are the hall marks of BL.^[2] This method provides ample opportunities for learners with diverse style, as learning materials are provided through online platforms. Availability of course content in the online platform provides maximum flexibility to the learners, while face-to-face sessions focus on improving the higher order thinking of the learners. Integrating the online and face to session

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provides for a better learning experience. By participating in online discussions and forums with their peers, learners gain the advantages of collaborative learning.^[4,5]

Health sciences programs impart critical thinking and clinical skills along with the required cognitive aspects. Although BL is widely used in higher education, its effectiveness in health professional education needs further exploration. Snodgrass (2011) reported that while the use of Wiki activities improved the clinical reasoning skills of undergraduate physiotherapy student's clinical reasoning skills from the teacher's perspective, the students reported that they preferred face-to-face sessions.^[6] Since the implementation of BL methods in health professional education requires in-depth understanding of evidence including the perception of educators, learners, and higher education administrators, conducting a mixed-method systematic review (SR) is warranted. An earlier SR identified the effect of BL in clinical education.^[7] In contrast to that review, this proposed review will synthesis the data from qualitative aspects of BL including the challenges and barriers of BL.

The objective of this mixed-method SR is to determine the effectiveness and appropriateness of BL in the health-care professional education. A mixed-methods SR will be used to broaden the evidence conceptualization, due to the inclusive nature. Garrison and Kanuka define "BL is the thoughtful integration of classroom face-to-face learning experiences with online learning experiences."^[2]

Review questions

1. What are the effects of BL method compared to traditional face-to-face teaching in improving critical thinking and clinical skills of graduate health professional education students?
2. How do undergraduate students perceive the blended method compared to face-to-face training?
3. What are the teacher's perceived advantages and disadvantages of blended methods compared to traditional face-to-face training?

Methodology

A mixed-method SR will be carried out to find out the answer for the review questions. Harden defines mixed-method SRs as "combining the findings of qualitative and quantitative studies within a single SR to address the same overlapping or complementary review questions."^[8]

This proposed SR includes both quantitative and qualitative studies conducted to identify the effects of BL in health professional education. Included quantitative and qualitative studies will appraised by independent

reviewers using predetermined checklist. Extracted data from both quantitative and qualitative studies will be synthesized to draw the conclusion. This SR will use the Joanna Briggs Institutes (JBIs) mixed-method framework.^[9]

Population

The study population is entry-level graduate students of health-care professional courses. Studies included Medical, Dental, Nursing, and Allied Health Sciences graduate students will only be considered for this review.

Intervention

Blended learning

Integration of online teaching with face-to-face training will only be considered as an intervention for this review. Studies with only an online component and flipped class rooms will be excluded. Likewise, studies on courses that only share the teaching materials through online platform will not be considered as BL. Studies exploring the effectiveness of BL for postgraduate training and continuous professional development course will not be included.

Comparison

Traditional face-to-face training without any online teaching components will only be considered as comparison.

Outcomes

Primary outcomes

- Improved/achieved learning outcomes assessed through theory and practical examinations
- Learner's perception of the BL identified through qualitative methods such as satisfaction surveys and focus group discussions
- Teachers' perception of blended learning in comparison to traditional teaching assessed through qualitative methods.

Secondary outcomes

- Cost-effectiveness of BL compared to traditional training
- Challenges faced in implementing blended curriculum
- Institutional support required.

Protocol

A systematic search will be carried out in Cochrane Central, MEDLINE, CINAHL, EMBASE, PsycINFO, Scopus, ERIC, ScienceDirect, and OT Seeker. Unpublished studies will be searched through WorldCat Dissertations (OCLC), ProQuest Dissertation, and ISI

conference proceedings. Literatures from 2004 will be considered for the study.

Inclusion criteria

- Randomized controlled studies and quasi-experimental studies comparing the effect of BL and traditional training
- Qualitative studies which assessed the learner's and teacher's perceptions about BL will also be included.

Proposed Search Strategy

Medline

A proposed search strategy for Medline © database is presented below. The search strategy will be modified for each individual database.

1. Computer-assisted instruction
2. (Blended or self-blended or distributed or hybrid or combined or multi-method or mixed or multiple) adj2 (learning or course or curricula* or module* or education or instruction or training or teaching)).mp.
3. (Traditional or "face-to-face" or "face-2-face" or face2face or f2f or classroom) adj3 (online or internet or web or "e-learning" or e-learning or virtual or digital or computer or distance)).mp.
4. (Computer-aided or computer-assisted or computer-mediated or computer-enhanced or computer-support* or technology-aided or technology-assisted or technology-mediated or technology-enhanced or computer-support*) adj2 (learning or course or curricul* or module* or education or instruction* or training or teaching)).mp
5. 1 or 2 or 3 or 4
6. exp Education, Professional
7. exp Students, Health Occupations
8. Education, Undergraduate
9. 9 Undergrad*.mp.
10. Baccalaureate*.mp.
11. 6 or 7 or 8 or 9 or 10
12. exp Health personnel
13. (Health professional* or health personnel* or allied health or health* support worker* or paramedic or paramedics* or paramedical staff* or dental hygienist* or emergency medical responder* or Nurse* or midwife* or midwives* or anatomist* or anesthetist* or anaesthesiologist* or audiologist* or dentist* or physical therapist* or physiotherapist* or occupational therapist* or respiratory therapist* or pathologist* or imaging specialist* or radiographer* or radiologist* or sonographer* or ultrasonographer* or radiation therapist* or nutritionist* or dietician* or exercise physiologist* or exercise scientist* or sport* physiologist* or sport* scientist* or kinesiologist* or dosimetrist* or optometrist* or orthotist* or prosthetist* or orthoptist* or perfusionist* or podiatrist* or recreation* therapist*

or neurophysiologist* or physician* or allergist* or cardiologist* or endocrinologist* or gastroenterologist* or GP or GPs or general practitioner* or geriatrician* or neurologist* or oncologist* or ophthalmologist* or otolaryngologist* or pediatrician* or physiatrist* or pulmonologist* or rheumatologist* or surgeon* or urologist* or dermatologist* or Hepatologist* or Gerontologist* or osteopath* or otologist* or neonatologist* or Orthopedist* or periodontist* or prosthodontist* or chiropractor* or cytotechnologist* or endoscopist* or phlebotomist* or immunologist* or gynecologist* or hematologist* or obstetrician* or clinician* or health service provider* or health-care professional* or health-care student*).mp.

14. 12 or 13

15. 5 and 11 and 14

Data extraction and synthesis

Retrieved studies meeting the criteria will be coded and assessed for quality by the reviewers independently (SN, RSK). In case of conflicts, the third reviewer will be consulted (LR/SM). Covidence® systematic review management tool will be used to manage the search results.

JBI Meta-Analysis of Statistics Assessment and Review Instrument will be used to assess the quantitative studies; qualitative studies will be appraised using JBI Qualitative Assessment and Review Instrument. Economic analysis of BL curriculum in health professional educations will be carried out using JBI Cost Technology and Utilization assessment and Review Instrument. Two reviewers (SN and RSK) will independently review the quality of articles prior to inclusion. In case of conflicts, reviewers will resolve it through discussions, or the other review team members will be consulted.^[9]

Data synthesis will follow the SUMARI module prescribed by JBI mixed-method SR guidelines. Quantitative and qualitative data will be analyzed as prescribed by JBI Mixed Methods Assessment and Review Instrument.

Protocol Registration

This protocol is registered with the International Register of Systematic Reviews (PROSPERO) with the registration number CRD42018082699.^[10]

Discussion

This extended review will identify the effectiveness of BL as a teaching method, imparting knowledge and skills among the entry-level health professional graduate students. The method adopted is rigorous and will explore the qualitative aspects, including teacher's and learner's perception.

Liu *et al.* analyzed the quantitative aspects of BL in their SR, which includes the training of graduate, postgraduate, and continuing professional development programs. However, that review did not consider the qualitative aspects of BL.^[11] McCutcheon *et al.* synthesized the evidence on the effects of BL in imparting clinical skills among the graduate level nursing students, excluding the studies conducted in other professionals.^[12]

This proposed review will be the first mixed-method SR to address the review question through consideration of both quantitative and qualitative data.

Considering the heterogeneity of the studies based on the preliminary literature search, this proposed review will adopt a mixed-method SR methodology. This will be an ideal method to synthesize the evidence on BL, as the effectiveness of any teaching learning method should be viewed both quantitatively and qualitatively. This review will also identify the existing gaps in BL research.

Implications to Practice

This review findings will be useful for health professional educators in adapting BL as teaching method in their curriculum. This review will also enable us to understand the learner's and educator's perception about BL. Understanding the evidence on facilitating and hindering factors to adapt BL. Cost analysis will provide economic aspects of implementing BL in health professional education.

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Conflicts of interest

There are no conflicts of interest.

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