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Experimental and Quasi-Experimental Studies on Teaching and Learning Methods 1987 to 2015

Kathleen A. O'Connell, PhD, RN, FAAN

Health and Behavior Studies, Teachers College, Columbia University, New York, NY, USA

Tresa Kaur, PhD, RN-BC, CNE, CHSE, CTN-A

Nursing Education, Department of Health and Behavioral Studies, Teachers College, Columbia University, New York, NY, USA

The National League for Nursing research priorities focus on the need to build the state of science in nursing education through research (2016). Previous reviews have focused on specific teaching strategies like concept mapping (Daley, Morgan & Black, 2016), e-learning (Koch, 2014), and simulation (Jumah & Ruland, 2015). Although Dunbar-Jacob's presentation (2016) on the science of nursing education at the NLN research conference included a brief review of the studies in nursing education, no published reviews of the experimental and quasi-experimental studies of teaching and learning methods in nursing education could be found. The purpose of this study was to enumerate the types of experimental nursing education research that has been done on teaching and learning methods and to characterize the findings and the methodological challenges in this body of research.

The Cumulative Index of Nursing and Allied Health Literature (CINAHL) was searched using the search terms "education, nursing," "learning methods" or "teaching methods" and "experimental studies" or "quasi-experimental studies." The search was limited to peer reviewed research articles in the nursing journal subset. This search produced a total of 145 studies. Initial review, which eliminated duplicates and articles not meeting criteria (i.e., being published in English; and not solely published in *Dissertation Abstracts*), reduced the number of studies to 114. Each article was reviewed by one investigator and coded on 14 variables. Inter-coder reliability was computed on 17% of the studies. It was not possible to do a meta-analysis on this group of studies because of the wide variety of methods studied. Therefore, a structured literature review is presented.

Sixty percent of the studies were published in journals devoted to nursing education, including journals on simulation and staff development. Publication date of the studies ranged from 1987 to 2015 with 19% of the studies published before the year 2000, 30% published between 2000 and 2009 and 51% since 2010. Just over half (54%) of the studies appeared to be conducted in the United States.

Coding of the major dependent variables in the studies revealed that 56% of the studies were concerned with learning outcomes only, 20% did not report learning outcomes, but reported other outcomes such as attitudes and self-efficacy, and 24% reported both types of outcomes. Teaching and learning methods studied included simulation (19 studies), online strategies (17 studies), cooperative methods (10 studies), and problem-based learning (4 studies). However, 56% of the methods in the studies could not be grouped with any other method. The content taught appeared to be mostly general nursing knowledge and skills, but 15 (13%) of the studies concerned pharmacology or medication calculation. Seventy-seven percent of the studies showed statistically significant group differences on at least one major outcome variable.

Methodological coding revealed that 73% (N = 83) of the sample were quasi-experimental studies, 19 of which included no comparison groups. Over 78% of those with no comparison groups were conducted since 2010. The sample sizes ranged from 14 to 900, with only 32% having more than 100 participants. Eighty-two percent of the studies had undergraduate participants, while 16% involved staff nurses and 2% concerned graduate students.

The findings of this review were similar to those presented by Dunbar-Jacob (2016) with respect to the focus on undergraduate students, the paucity of randomized designs, the problems with small sample

sizes, and the types of strategies tested. However, this presentation covers a longer time span, indexes the countries where the research took place, discusses the content taught as well as the strategies used, reports the outcomes studied, and the proportion with significant findings, and shows the trajectory of the research over time. Overall, review revealed a considerable increase in the number of published studies of teaching and learning methods in the recent years, with nearly half of the studies conducted outside of the United States. The majority of the studies included learning outcomes. Methodological rigor of the studies is a concern with 68% having fewer than 100 study participants, the majority employing quasi-experimental designs and recent studies having no comparison groups. The studies reviewed here often appeared to be single forays into research and pilot studies with little evidence that investigators continued to pursue a program of research.

It is well known that there is little funding for research in higher education, requiring most research endeavors to be small scale and preventing investigators from making research a major portion of their professional lives. Furthermore, Broome, Ironside, and McNelis (2012) conducted a study of faculty at 21 schools, which showed that lack of funding and heavy workloads were barriers for conducting nursing education research. With the publication of relatively more studies in recent years, it may be that nursing education research is finding a more prominent place in academic nursing. Future research should focus on replication at different sites, with different instructors. Moreover, methods of collaborating that allow multi-site studies to build nursing research around evidence based teaching and learning strategies should be explored.

Title:

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References:

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Abstract Summary:

This review shows that research on teaching and learning methods has increased dramatically since the year 2000, that much of the research published in English is done outside of the U.S., that methodological shortcomings remain problematic, and that learning outcomes are a major focus.

Content Outline:

I. Introduction

1. The need for evidence-based nursing education research
2. What other reviews cover
3. Purposes of this review

II. Methods

1. Search protocol
2. Exclusion criteria

III. Findings

1. Number of studies

- i. 145 studies identified
- ii. Review reduced to 114
- iii. Number published per decade
- iv. Number in the US.
- v. Types of journals

2. Variables studied

- a. Independent variables—
 - i. types of methods
 - ii. content of teaching
- b. Dependent variables
 - i. Learning outcomes
 - ii. Other outcomes

3. Methodological issues

- a. Proportion of experimental/quasi-experimental studies

- b. Sample sizes
- c. Types of study participants

IV. Discussion

1. Studies primarily focus on undergraduate students
2. Relatively few true experimental studies
3. Sample sizes appear too small for many studies
4. Increase in the number of studies, especially since 2010
5. Issues in improving nursing education research
6. Proposal for more collaborative research and more follow-up research

First Primary Presenting Author

Primary Presenting Author

Kathleen A. O'Connell, PhD, RN, FAAN
Teachers College, Columbia University
Health and Behavior Studies
Isabel Maitland Stewart Professor of Nursing Education
New York NY
USA

Professional Experience: Kathleen A. O'Connell is the Director of the Online Nursing Education Program at Teachers College Columbia University. She conducted federally funded research on smoking cessation for over 20 years. She teaches research methods courses and is currently doing research on overactive bladder syndrome and on nursing education. She has published reviews of nursing research including a review of studies in nursing practice published in *Image* in 1976 and a 2009 book chapter on nursing research on smoking cessation.

Author Summary: Kathleen O'Connell is the Isabel Maitland Stewart Professor of Nursing Education at Teachers College, Columbia University and the Director of the new Online Nursing Education program at Teachers College. She teaches research methods courses and is currently doing research on overactive bladder syndrome and on nursing education.

Second Secondary Presenting Author

Corresponding Secondary Presenting Author

Tresa Kaur, PhD, RN-BC, CNE, CHSE, CTN-A
Teachers College, Columbia University
Nursing Education, Department of Health and Behavioral Studies
Faculty
New York NY
USA

Professional Experience: -Certified Nurse Educator -MS in Nursing Education -Doctoral Dissertation in

Nursing Education, Simulation and Debriefing -Program of Research in Simulation -Faculty Member in Online Ed.D. Nursing Education Program

Author Summary: Tresa Kaur Dusaj is a Faculty Member at Teachers College, Columbia University. Tresa unites her background in informatics, nursing education, and technology to develop innovative teaching strategies for online doctoral education. She received her B.S.N from Johns Hopkins University, a M.S. in Nursing Education from New York University, and PhD at Rutgers, The State University of New Jersey. Her program of research is in the area of simulation.