A Comparison of Instructional Methods for an Undergraduate Nursing Health Assessment Course

Nursing Education Research Conference 2018

Laura Markwick, DNP, FNP-C, FAANP

Tara Sacco, MS, RN, CCRN-K, AGCNS-BC, ACCNS-AG

St John Fisher College, Rochester, NY

Introduction

- Flipped Classroom vs Traditional classroom
  - Flipped classroom ensures active and high-impact learning more closely related to clinical practice (Billings, 2016)

- Use of technology with virtual patient interaction

Background

- Flipped Classroom design as pedagogical tool to enhance learning through increased faculty and student engagement and individualized learning (Paterson, 2017; Smith, 2017; Rotellar & Cain, 2016)

- Promote higher-order thought processes and reasoning skills in second language students (Kim, Park, Jang & Nam, 2017)

- Some studies have shown no difference in grades or level of satisfaction but suggest that intensity of the course has a factor (Whilliwer & Lystad, 2015)

- Students often resistant to change from traditional methods of instruction and sometimes find individual learning of content difficult without the face to face contact (Telford & Senior, 2017)

- Virtual patient technology provides a comprehensive learning experience in a safe environment, engaging students to develop their assessment and documentation skills. The combination of flipped classroom design with virtual patient experience was shown to allow for a personalized learning experience that promoted higher-level learning (Lichvar, Headges, Benedict, & Donihi, 2016)

Background

- Studies completed in pediatric course for FNP program and pharmacy program demonstrated favorable outcomes and positive student and faculty satisfaction (Critz & Knight, 2013; Pierce & Fox, 2012)

- Two integrative reviews evaluating studies involving nursing education and flipped classroom design indicates flipped classroom promotes active learning with student engagement and self-efficacy. Student satisfaction scores were mixed and in some studies had an inverse relationship to improved performance. No studies done in undergraduate Health Assessment course (Presti, 2016; Njie-Carr, Ludeman, Lee, Dordunoo, Trocky, & Jenkins, 2017, Betihavas, Bridgman, Kornhaber, & Cross, 2015)

- Scoping review using five-stage framework Arksey and O'Malley indicates much indirect evidence of improved academic performance, student satisfaction with the use of the flipped classroom in nursing education but a lack of conclusive evidence regarding contribution to lifelong learning (O'Flaherty & Phillips, 2015)

Course Design

- Health Assessment BS Nursing program
  - Course focuses on the theory and development of physical assessment skills and health pattern evaluation skills that are essential to culturally sensitive clinical judgements, therapeutic interventions, and achievement of desired health outcomes across the lifespan.
  - 2 Hr weekly class (lectures, discussion, podcasts, online learning)
  - 2 Hr weekly lab with coordinated curriculum (videos, hands on practice)
  - Methods of Instruction: Lecture, Discussion, Videos, Hands on practice

Course Learning Outcomes

- Learning outcomes
  - Integrate knowledge of anatomy and physiology into health assessment process
  - Build foundation for making sound ethical and clinical judgements rooted in collection and interpretation of assessment data
  - Perform health status assessments and physical examination using a variety of tools and techniques for the orderly collection and documentation of comprehensive assessment data
  - Adopt a holistic approach that acknowledges the individuality of clients from a cultural and lifespan perspective
  - Communicate effectively using therapeutic techniques when conducting a comprehensive health history

Student evaluation

Assignment	Evaluation Method	Percent
Shadow Health DCE	Modules 11@2% ea; comprehensive @ 5%	27
Examinations (5 at 6% each, final @15%)	Multiple choice examinations	45
Head-to-Toe Physical Examination	"Live" performance demonstration	20
SLUMS Mental Status Assessment	Written assignment	3
Nutrition assignment	Written summary/reflection	3
Female Reproductive unit assignment	Blackboard quiz	2
	Total	100

Assignments

Item	Evaluation Type
Nutrition Assignment	Formative
St. Louis University Mental Status (SLUMS)	Formative
Health History Module	Formative
Skin Module	Formative
Head, Eyes, Ears, Nose, Throat Module	Formative
Neurologic Module	Formative
Cardiovascular Module	Formative
Focused Assessment: Chest Pain	Formative
Pulmonary Module	Formative
Focused Assessment: Cough	Formative
Abdominal Module	Formative
Focused Assessment: Abdominal Pain	Formative
Musculoskeletal Module	Formative
Female Reproductive Module	Formative
Comprehensive Assessment Module	Summative
Final Head to Toe Demonstration	Summative
Exam 1	Formative
Exam 2	Formative
Exam 3	Formative
Exam 4	Formative
Exam 5	Formative
Final Exam	Summative
Final Course Grade	Summative

Methodology

- Quasi Experimental Comparison Design

- 3 groups:

  - Traditional Lecture (Traditional group): in class lecture and individual technology-based virtual patient assignment at home

  - Flipped Class (Flipped/Traditional group): podcast prior to class and individual technology-based virtual patient assignment in class with faculty support

  - Flipped Class with fully integrated technology classroom (Flipped/Integrated group): podcast prior to class and group technology-based virtual patient assignment in class with faculty support

- Students registered for course section prior to assignment to groups

Methodology

- Assignments and exams identical between the 3 groups
  - Individual versus group completion
  - Participants consented to have their grades included in analysis
  - Assignments were graded by lab instructors
    - Inter-rater reliability
  - Exams were administered by course faculty
    - Par-Score multiple choice
- Course evaluations completed and reported in aggregate as per normal procedures

Sample

- Convenience sample, students enrolled in course
  - Course enrollment occurred prior to assignment of groups
  - Option to participate and study information provided by a faculty member not involved in the course
- Student body (college): 2,759 total UG students, 1,111 men & 1,648 women; average age 20.8 (17-71)
  - UG Nursing: 692 total students, 61 men & 631 women; average age 20.8 (17-57)

Sample

- Groups
  - Total n = 95
    - Traditional n = 28
    - Flipped/Traditional n = 34
    - Flipped/Integrated n = 33
- Course evaluations
  - Total n = 73
    - Traditional n = 19
    - Flipped/Traditional n = 25
    - Flipped/Integrated n = 29
- No comparison of demographics between groups was made

Data Analysis

- Faculty without course responsibilities collected student data

- Assignment grades were entered into a de-identified, password protected database

- Aggregate course evaluation scores provided by the college were compared

- Quantitative analysis completed using SPSS 24
  - Kruskal-Wallis
  - One-way ANOVA

- Qualitative analysis completed of open-ended responses on course evaluations

Data Analysis: Assignments

Assignment	p value[*]	Type of Evaluation
Nutrition Assessment	.001[a]	Formative
St. Louis Mental Status Exam	.002[a]	Formative
HEENT Module	.000[a]	Formative
CV Module	.000[a]	Formative
Neurologic Module	.02[a]	Formative
Abdominal Module	.000[a]	Formative
Musculoskeletal Module	.000[a]	Formative
Focused Exam: Cough	.000[a]	Formative
Respiratory Module	.000[b]	Formative
Health History Module	.023[b]	Formative
Exam 5	.024[b]	Formative
Comprehensive Assessment Module	.000[a]	Summative

[*] p < .05; a = Kruskal-Wallis, b = ANOVA

Data Analysis: Assignments

- In formative assessment, the:
  - Flipped/Integrated group significantly outperformed both the Traditional & Flipped/Traditional groups on the Nutrition Assessment, & HEENT, CV, Abdominal, Musculoskeletal, & Focused Exam: Cough Modules
  - Flipped/Integrated group significantly outperformed the Traditional group on the St. Louis Mental Status Assignment & Exam 5
  - Flipped/Integrated group significantly outperformed the Flipped/Traditional group on the Neuro, Respiratory, & Health History Modules
  - Flipped/Traditional group significantly outperformed the Traditional group on the St. Louis Mental Status Assignment
  - Traditional Group significantly out performed the Flipped/Traditional group on the CV module

- In summative assessment, the:
  - Flipped/Integrated group significantly outperformed both the Traditional & Flipped/Traditional groups on the Comprehensive Assessment Module

Data Analysis: Course Evaluations

- One item on course evaluations demonstrated significant differences between groups
  - "I learned a lot in this class" (p = .037; Kruskal-Wallis). The Flipped/Traditional group scored significantly lower than the Traditional group on post hoc analysis
- Qualitative analysis
  - Students enjoyed: podcasts, lectures, slides, modules, in class quizzing, skill demonstration/lab work, group work, flipped classroom, interactive learning, lecture before lab
  - Students did not enjoy: podcasts, modules, group work, flipped classroom

Discussion

- Few differences were noted in summative evaluation

- For differences in formative evaluations, individual vs. group work on the modules may have influenced grades

- Few differences in course evaluations
  - Some enjoyed flipped, some did not
  - Some students reported a perception that the design of the study had influenced the design of the course
  - In the future, recommend allowing students to self-select into flipped versus traditional lecture settings

- Similar findings to prior study using virtual technology and flipped classroom design with non-nursing students and prior studies in nursing education using flipped classroom design
  - Enhanced learning
  - Improved outcomes

Limitations

- Limitations
  - Students not able to self select to which instructional format they desired
  - Group vs. individual completion of assignments may have influenced grades
  - Small sample size and generalizability concerns
  - Assurance of inter-rater reliability in grading

Conclusion

- In formative assessment, students in the Flipped/Integrative group outperformed their counterparts on 10 of 19 assignments
  - Few differences between Flipped/Traditional and Traditional Setting

- In summative assessment, no difference was detected between groups in 3 of 4 assignments

- Student perception of the course design was mixed

- Further research is needed:
  - Larger sample size with longitudinal design
  - Impact on clinical performance and future courses
  - Comparison when students self-select into a particular design

References

- Betihavas, V., Bridgman, H., Kornhaber, R., & Cross, M. (2016). The evidence for 'flipping out': A systematic review of the flipped classroom in nursing education. *Nurse Education Today,38*, 15.

- Billings, D. (2016). 'Flipping' the Classroom. *The American Journal of Nursing, 116*(9), 52-56.

- Critz, C.M., & Knight, D.G. (2013). Using the flipped classroom in graduate nursing education. *Nurse educator, 38 5*, 210-3.

- Kim, J., Park, H., Jang, M., & Nam, H. (2017). Exploring flipped classroom effects on second language learners' cognitive processing. *Foreign Language Annals*, *50*, 260-284. doi: 10.1111/flan.12260

- Lichvar, A. B., Hedges, A., Benedict, N. J., & Donihi, A. C. (2016). Combination of a flipped classroom format and a virtual patient case to enhance active learning in a required therapeutics course. *American Journal of Pharmaceutical Education*, *80*(10), 1-8.

- Njie-Carr, Ludeman, Lee, Dordunoo, Trocky, & Jenkins. (2017). An Integrative Review of Flipped Classroom Teaching Models in Nursing Education. *Journal of Professional Nursing,33*(2), 133-144.

- O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education*, *25*, 85-95.

References

- Paterson, J. (2017). Flipped classrooms turn teaching upside down. *Principal Leadership*, *17*(8), 34-38

- Pierce R, Fox J. Vodcasts and Active-Learning Exercises in a "Flipped Classroom" Model of a Renal Pharmacotherapy Module. *American Journal of Pharmaceutical Education*. 2012;76(10):196. doi:10.5688/ajpe7610196.

- Presti, C. (2016). The Flipped Learning Approach in Nursing Education: A Literature review. *The Journal of Nursing Education, 55*(5), 252-7.

- Rotellar, C., & Cain, J. (2016). Research, perspectives, and recommendations on implementing the flipped classroom. *American Journal of Pharmaceutical Education*, *80*(2), 1-9.

- Smith, C. E. (2017). The flipped classroom: Benefits of student-led learning. *Nursing*, *47*, 20-22. doi:10.1097/01.NURSE.0000513620.19174.90

- Telford, M., & Senior, E. (2017). Healthcare students' experiences when integrating e-learning and flipped classroom instructional approaches. *British Journal of Nursing*, *26*(11), 617-622.

- Whillier, S., & Lystad, R. P. (2015). No differences in grades or level of satisfaction in a flipped classroom for neuroanatomy. *Journal of Chiropractic Education*, *29*, 127-133. doi: 10.7899/JCE-14-28