A Story of Success: Teaching Evidence-Based Practice using an Inquiry-Based Approach

Elizabeth Roe, RN, PhD
Sally Decker, RN, PhD
Saginaw Valley State University
Sue Garpiel, RN, C, MN, IBCLC
Covenant Healthcare
Tanner and Lindeman, 1987, in their conclusion to a Delphi Study of 121 nurses, stated that “.. nurse educators are concerned both with the ways in which they may incorporate research findings into their teaching and with approaches to engender a spirit of inquiry in their students.” (p. 58)
Broadly, inquiry is “...the dynamic process of being open to wonder and puzzlements and coming to know and understand the world” and is “…a process where students are involved in their learning, formulating questions, investigate widely and then build new understandings, meanings and knowledge.”

(Galileo Educational Network, Alberta Learning, 2004)
“...an orientation toward learning that is flexible and open, and draws on the varied skills and resources of faculty and students, in which faculty are co-learners who guide and facilitate the student-driven learning experience to achieve goals of nursing practice.”
Inquiry-based Learning (IBL) and Critical Thinking (CT)

- Inquiry is related to critical thinking in that it makes visible how to engage in higher level information processing to guide practice.
- Studies in nursing of the relationship between CT and IBL have suggested this approach may be have a differential effect depending on baseline CT score. (Magnussen, Ishida & Itano, 2000; Flannelly & Inouye, 1998)
The Inquiry Approach

- How to formulate questions (note: In EBP, nurses have used the ASU PICO approach)
- How to collect information from a wide variety of resources (note: this has been referred to as information literacy)
- How to use the information in a meaningful way (note: these are synthesis, presentation and evaluation or leveling skills)

Owens, Hester & William, 2002, p.618
Inquiry-based vs. Problem-based learning

- **Differentiation**
  - Inquiry/enquiry-based learning (IBL, EBL)
  - Problem-based learning (PBL)
  
  In some of the nursing literature the terms are used interchangeably.

  When a distinction is made, IBL is referred to as more flexible and holistic (Shoultz et al., 1998; Magnussen, Ishida & Itano, 2000; and Holaday & Buckley, 2008) is more fluid, includes more types of information as is less linear (Shoultz et al., 1998), and promotes a broader scope of investigation for more contextual capacity (Bebb & Pittman, 2004). PBL deals with problems and IBL is more situation and people oriented and deals with questions (Shoultz et al., 1998).
Historical base of the inquiry based learning in education, medicine

- K-12 systems have encouraged inquiry as a method to increase student involvement.
- Medicine most often refers to a practice-theory gap as the rationale and has explored PBL since the 1960’s - best known are Case Western Reserve in the US and McMaster in Canada.
Evidence from Medicine

- This is an interesting literature with arguments that an effect size large enough to justify the use of PBL has not been established and that the 2006 studies are still flawed as they depend on student perception (Colliver & Markwell, 2008).

- In contrast are arguments that an effect size would not be anticipated due to changes which would need to be excessive, the student selection process and many current common practices now containing PBL (Albanese, 2000).

- Some authors have concluded that there are is evidence (Norman & Schmidt, 2000, Tiward, Lai, So & Yuen, 2006 & Schmidt, Vermeulen, van Molen, 2006) of superior cognitive outcomes.
Research evidence related to IBL in nursing

- Most of the evidence is qualitative and from the UK: Biley & Smith, 1999; Morris & Turnbull, 2003; Bebb & Pittman, 2004; Ashby et al., 2005; Horne et al., 2007; Brown, Wilkins, Leamon & Rawnson, 2008; Kirwan & Adams, 2009.

- Of these, the Horne et al. article best summed the findings with students self reporting an increase in ability to work in a team, in communication, in presentation skills and independent learning skills. This same study also pointed to the need to help students learn to work in groups, the perception of time requirements and the need for consistent facilitation of the group.
AACN: “...”every academic discipline is grounded in discrete inquiry-based applications that are distinctive to that discipline.” (AACN, 2008, p.7)

In a qualitative study by Callister et al. (2005), students identified benefits of increased interest in EBP, enhanced CT skills, motivation to continue professional growth, becoming better consumers of research, greater understanding of the “real world” of clinical practice, and stimulus for graduate education.

Magnussen, Ishida, & Itano (2000) and Flannelly & Inouye (1998)—quasi-experimental studies of CT and IBL did not find a pre-post change with the exception of students low on entry...
Link between Evidence-based Practice (EBP) and inquiry learning, critical thinking

- **What is EBP?**
  - “…the conscientious, explicit, and judicious use of current best evidence in making decisions” (Sackett, Rosenberg, Gray, Haynes & Richardson, 1996).

**Relationship**

- In healthcare, EBP is an approach that enables clinicians to provide the highest quality of care in meeting the multifaceted needs of their patients and families through the use of current best evidence just as inquiry-based learning is an approach or philosophy which teaches the knowledge, skills and attitudes for use of inquiry (collection/evaluation/use of best evidence) to explore the contextually rich environment and answer practice questions.
Student identified barriers with IBL:

- Adjustment to an IBL approach (Expectations of type of learning they “should” be getting, learning outcome)
- Group interaction skills
- Role of the facilitator
- Resources (Perception of time requirements, Access to resources such as the library)

Benefits of IBL for students

- More flexible
- Holistic
- Appropriate for a variety of learning styles
- Multidisciplinary
  - (Callister, Matsumera, Lookinland, Mangum, & Louckes, 2005; Morris & Turnbull, 2004)
Experiences of IBL approach for EBP

- **Student**
  - “Good to learn how exactly it is done [leveling] versus just that it was done.”
  - “When you see something that is ‘evidence-based’ you know that it is the right thing for your patient—you have more confidence in practice – in talking with the patient- you can say the evidence for this is…”
  - “I was fortunate that I was in a good group, it would be hard it you weren’t.”
Experiences of IBL approach for EBP

- Nursing professionals
  - “I have a hard time understanding the research articles in journals so the student presentations are very helpful to me.”
  - “I am glad that SVSU and the hospital support this project, I think it has helped improve the care we provide.”
  - “It is nice to see the process that the students go through, it is obvious that they work very hard.”
Experiences of faculty and staff, librarians with IBL

- “The students need the whole semester to find the information, sometimes that is not even long enough.”
- “Group work is critical to the success of the project.”
- “There are times when I just want to ‘show’ the students what exactly to do but I know that is not the best way for them to learn.”
Synthesis of Different models

- Stetler (2001)
  - Research utilization
- ARCC (Fineout-Overholt, Melnyk & Schultz, 2005)
  - EBP steps
- Iowa Model (Titler, et al., 2001)
  - Knowledge and problem-based triggers
  - Team focus
- Inquiry based
  - Model or
  - Approach to learning / student outcomes
A Collaborative Project
To foster collaboration with agencies and further the knowledge of EBP in both professional nurses and nursing students
To synthesize and share evidence-based knowledge about specific nursing topics
To expand the student’s spirit of inquiry and ability to use resources
Model that is used

- Using an inquiry-based approach (working in groups)
- ARCC process
  1. Ask the clinical question
  2. Search for the best evidence
  3. Critically appraise the evidence
  4. Address the sufficiency of the evidence – to implement or not implement
  5. Evaluate the outcome of evidence implementation
Project Background

- Began as a research utilization project about 15 years ago
- Evolved into an EBP project using the Stetler Model for support
- Inquiry approach and use of the ARCC model integrated
Step One

- Individuals/groups at the agencies identify practice interventions/issues they would like summarized in an Evidence-based presentation
- Student groups write a PICO question and clarify it if needed
PICO Questions

- P = Population of interest
- I = Intervention of interest
- C = Comparison of interest
- O = Outcome of interest

Example

“For adult general surgical patients (P) does the use of music in the PACU (I) compared to standard care (C) reduce pain and anxiety (O)?”
Steps Two, Three and Four

- Conduct a literature review
  - Work with specified “embedded librarians” on search terms and databases and sources of reviews

- Focus the intervention/search
  - Work with agency personnel if needed

- Appraise evidence
  - Create a chart
    - Level of evidence

- Make recommendations and evaluate outcomes
  - Strength of evidence
<table>
<thead>
<tr>
<th>Source</th>
<th>Sample</th>
<th>Design</th>
<th>Outcome Measures</th>
<th>Findings</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agwu &amp; Okoye, 2007</td>
<td>100 hysterosal-pingography patients</td>
<td>RCT</td>
<td>Vital signs and anxiety</td>
<td>The blood pressure and pulse rate of the experimental group were significantly lower than the values in the control group. The STAI scores during the procedure were significantly lower for the experimental group than the control.</td>
<td>IIA</td>
</tr>
<tr>
<td>Klassen, Liang, Tjosvold, Klassen, Hartling, 2008</td>
<td>Search of 16 databases for trials involving children undergoing procedures where music was used as an intervention. 19 trials were included involving 1513 subjects</td>
<td>Systematic review of RCTs</td>
<td>Pain and anxiety</td>
<td>The methodological quality of the studies was generally poor. Overall, music therapy showed a significant reduction in pain and anxiety.</td>
<td>IA</td>
</tr>
<tr>
<td>Ullmann, Fodor, Schwarzberg, Carmi, Ullmann, Ramon, 2006</td>
<td>172 questionnaires from operating room physicians and nurses</td>
<td>Descriptive survey</td>
<td>Frequency and preference of music in OR</td>
<td>63% listened to music on a regular basis with classical music is the most frequent (58%). and most of the responders do not choose the type of music according to the type of the procedure. Nurses were more likely to listen to music. 78.9% of the participants claimed that music in the OR makes them calmer and more efficient.</td>
<td>VI</td>
</tr>
</tbody>
</table>
Step Five

- Students present findings to the agency for applicability and agency personnel add input about the recommendations regarding fit to setting, feasibility, and consistency with current practice.

- Example of summary
  - CINAHL, MEDLINE, Cochrane, and Briggs Institute were searched using the terms “music”.
  - There is B level evidence to recommend the use of music for decreasing anxiety in ... patient populations.
Student Experience

- From students
  - “Nice that we could apply it to community organizations as it increases our credibility in the community – internationally.”
  - “Helps us in our future classes, when writing papers, to do article analysis and how to support our ideas.”
  - “Even the working in a group was hard at times, I know that it will help me in the future.”
  - “Working with the nurses and doing the presentation helped me be more confident with my communication.”
Agency Experience

- From nurses at the agencies
  - “I wouldn’t have a clue how to find the research, let alone the time - the student presentations help me stay current.”
  - “It’s good to know if there is research to support what we are doing.”
  - “I have submitted several topics for SVSU students and have been impressed with what they found.”
  - “I always look forward to attending the student presentations and I know others do too.”
Agency Experience

- From an Administrator
  - “We have changed several policies based on the findings from the student projects – it helps us keep our care current.”
  - “Involvement in these projects helps us meet agency goals regarding facilitation of research at the hospital.”
  - “We use the evidence books a lot, they are very helpful.”
Albanese, M (2000). Problem-based learning: Why curricula are likely to show little effect on knowledge and clinical skills. Medical Education, 34, 729-738.


Titler, M, Kleiber C; Steelman V, Rakel B; Budreau G; Everett C; Buckwalter K; Tripp-Reimer T; & Goode C. (2001). The Iowa Model of Evidence-Based Practice to Promote Quality Care. Critical Care Nursing Clinics of North America, 13 (4), 497-509.