


Outcomes of an Evidence-Based Research (EBR©) tool to Teach Online Research and Critical Thinking Skills

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Need for development of an Evidence-based Research (EBR©) Tool

- Proliferation of medical literature
- Help needed for EBR process
- Lack of critical thinking skill to judge scientific literature
- Technology impacts information access (too much, not high quality)
- Web-based application with mobile view developed and tested
- Research based content
- Mapped to Information Literacy standards
- Mapped to Critical Thinking competency standards
- Two EquipLCU grants enable web-based tool with embedded questions
- Research collaborative established with Lebanese American University to further test EBR © tool

Scientific Background of EBR Tool ©

- **Cognitive Apprenticeship Theory (CAT)**
 - Rooted in Social Cognitive Theory
 - Learning takes place through explanation and integration (Dennen & Burner, 2008)
 - Informed instructional design elements (Contact North, 2012)
- **Need for scientific evidence on using technology in EBP education** (Melnik, 2012)
- **EBR Tool © presents how to conduct online research from writing your problem as a searchable question to dissemination of findings**
- **EBR Tool © 10 step Process** (Library of Congress, 2014)

Preliminary Work

- ❖ Phase I:
- ❖ Research Readiness Self-Assessment (RRSA) [NIH funded project] 90% of college students & faculty over estimate their online research skills (Ivanitskaya, et al., 2012).
- ❖ Pilot: LCU interdisciplinary students tested using standardized online test (RRSA)=91% below national norm, n=22
- Phase I & 2: RN's (BSN & MSN) self-assessment of research skills moved from poor/fair into good/very good category, n=44 (Virginia Henderson International Nursing Library, <http://hdl.handle.net/10755/201898>).
- ❖ *Take Away: Our students near national norm overestimating online research skills*

Qualitative Testing of Tool

- Text answers examined for themes using Wordle
- Text analyzed with inductive coding
- Coded responses:
 - Effective search
 - Search strategies
 - Credibility
 - Affective
 - Vague
 - Not applicable

THEMES BEFORE & AFTER EBR TOOL

Before:

- Need technical help
- Need specific search skills
- Need evidence-based skills

After:

- Acquired prioritized systematic search skills
- Focused/targeted search
- Made research process understandable/easier

Phase 2 Snapshot: How do Lubbock Christian University BSN & MSN students rate their research skills before & after using EBR tool?

BSN n=55

- Mean score change from pre/post 3.33 –2.79
- Paired t-test $t=4.38, p<0.01$

Mean student perception of research skills moved from being “good” to slightly above “very good” after using EBR tool

MSN n=51

- Mean score change from pre/post 3.49—2.61
- Paired t-test $t=6.85, p<0.01$

Mean student perception of research skills moved from between “good/very good” to between “very good/excellent” after using EBR tool

Testing Student Learning

Embedded questions assess the learner's ability to apply research skills to a clinical case while using the tool and allow immediate feedback to the student.

- **Learning outcome:** Students will be able to PICO a research problem. Response: 83% correctly apply PICOTS methodology to clinical case.*
- **Learning outcome:** Students will be able to differentiate the steps in critical appraisal of the research literature. Response: 73% correctly identified what would best help them critically appraise the literature needed for a clinical case.*

Pre/Post Narrative Comments

Pre-EBR: “What would you like to learn to improve your online research skills?”

- Need to find the most credible sources
- Need to narrow my search to fit my topic
- How to become faster and more thorough
- What peer-reviewed journal should I use?
- Learn more about evidence-based practice

Post-EBR: “What about the EBR tool contributed to your online research skills?”

- Able to narrow search topics
- Systematic way of doing research
- Differentiating between levels of research to which was the best
- How to ask/write a better research question
- How to find peer-reviewed research; increased confidence; showed how to write a good paper
- Nursing faculty review for curriculum changes & IE

Phase 3 Single-site RCT with Lebanese
American University students
and
Longitudinal data from LCU Nursing students

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