Rheumatology Visual Pearls for Internists: A Show and Tell

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American College of Rheumatology/Rheumatology Research Foundation Clinical Scholars Educator Award (CSE)

- 3 year grant for the development of Rheumatology based computer modules for Internal Medicine residents
  - 5 modules yearly for 2 years
  - Learning Management System (Moodle)
  - Premise is that the modules will increase the residents Boards scores in the subsection of Rheumatology
Traditional Lecture

- Introduction
- Prevalence/Incidence
- Pathophysiology
- Clinical Manifestations
- Diagnosis
- Treatments

- Also called Traditional Classroom Teaching
Traditional Lecture

- Most widespread method used.
  - **Advantages**
    - 1) Dispersion of material/content to large audience
    - 2) Cost effective
    - 3) Material presented by faculty with an expertise in the subject
    - 4) Able to ask questions to the faculty
    - 5) Timing/schedule
Traditional Lecture

- **Disadvantages**
  - 1) Material travels in one direction
  - 2) Sometimes too focused
  - 3) Decrease for group participation
  - 4) Ability to ask questions
  - 5) RETENTION
Problem Based Learning (PBL)

- Learning method characterized by use of patient problems as a context for students to acquire knowledge and learn problem solving skills. (1)

- **Advantages**
  - Deep learning
  - Decreased surface learning
  - Improved performance

Problem Based Learning (PBL)

- **Individual**
- **Small Group**
  - **Advantages**
    - 1) Learn from your peers
    - 2) More discussion
  - **Disadvantages**
    - 1) Dominant personalities taking over the group
    - 2) Taking advantage of others work by not preparing
    - 3) Not asking questions for fear of not looking “smart”
**Table 1** Mean (SD) scores for examination performance, attitudes to psychiatry and learning styles

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cohort 1 (n = 188)</th>
<th>Cohort 2 (n = 191)</th>
<th>Total (n = 379)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination performance</td>
<td></td>
<td></td>
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<tr>
<td>MCQ (% score)</td>
<td>60.7 (9.7)</td>
<td>64.3 (10.9)</td>
<td>62.5 (10.5)</td>
</tr>
<tr>
<td>Viva (% score)</td>
<td>69.8 (15.6)</td>
<td>73.6 (15.5)</td>
<td>71.7 (15.7)</td>
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<tr>
<td>ATP-30</td>
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<tr>
<td>Baseline</td>
<td>102.7 (10.6)</td>
<td>102.6 (9.6)</td>
<td>102.7 (10.1)</td>
</tr>
<tr>
<td>Outcome</td>
<td>108.4 (11.9)</td>
<td>107.0 (11.8)</td>
<td>107.7 (12.0)</td>
</tr>
<tr>
<td>SPQ surface learning</td>
<td></td>
<td></td>
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<tr>
<td>Baseline</td>
<td>14.1 (3.7)</td>
<td>14.5 (3.8)</td>
<td>14.3 (3.8)</td>
</tr>
<tr>
<td>Outcome</td>
<td>14.0 (3.8)</td>
<td>14.6 (3.8)</td>
<td>14.2 (3.8)</td>
</tr>
<tr>
<td>SPQ deep learning</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Baseline</td>
<td>19.4 (4.3)</td>
<td>18.8 (3.6)</td>
<td>19.1 (4.0)</td>
</tr>
<tr>
<td>Outcome</td>
<td>19.4 (4.6)</td>
<td>18.7 (3.9)</td>
<td>19.1 (4.3)</td>
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<tr>
<td>SPQ strategic learning</td>
<td></td>
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<tr>
<td>Baseline</td>
<td>16.1 (4.7)</td>
<td>16.3 (4.5)</td>
<td>16.2 (4.6)</td>
</tr>
<tr>
<td>Outcome</td>
<td>16.4 (4.7)</td>
<td>16.2 (4.3)</td>
<td>16.3 (4.5)</td>
</tr>
</tbody>
</table>

Computer Learning

- World Wide Web (WWW 1.0)
- World Wide Web (WWW 2.0)
  - Twitter, Second Life ....
- Learning management system
- Education delivered via the web
  - **Methods:**
    - 1) Course materials (articles, PBL...)
    - 2) Watching taped lectures and procedures
    - 3) Chat rooms (virtual small group studies)
    - 4) Entire courses on-line for degrees
Computer Learning

- **Advantages**
  - 1) Travel
  - 2) Personal time schedule
  - 3) Convenience
  - 4) Is it better than other methods for learning?

- **Disadvantages**
  - 1) Lack of personal interaction
  - 2) Cost- computers, internet connection
  - 3) No better than previous teaching methods
  - 4) RETENTION- both traditional lectures and PBL
The effect of computer-assisted learning versus conventional teaching methods on the acquisition and retention of handwashing theory and skills in pre-qualification nursing students: A randomised controlled trial

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e-Learning
Handwashing
Nurse education
Retention

ABSTRACT

Background: High quality health care demands a nursing workforce with sound clinical skills. However, the clinical competency of newly qualified nurses continues to stimulate debate about the adequacy of current methods of clinical skills education and emphasises the need for innovative teaching strategies. Despite the increasing use of e-learning within nurse education, evidence to support its use for clinical skills teaching is limited and inconclusive.

Objectives: This study tested whether nursing students could learn and retain the theory and skill of handwashing more effectively when taught using computer-assisted learning compared with conventional face-to-face methods.

Design: The study employed a two group randomised controlled design. The intervention group used an interactive, multimedia, self-directed computer-assisted learning module. The control group was taught by an experienced lecturer in a clinical skills room. Data were collected over a 5-month period between October 2004 and February 2005. Knowledge was tested at four time points and handwashing skills were assessed twice.

Setting and participants: Two-hundred and forty-two first year nursing students of mixed gender; age; educational background and first language studying at one British university were recruited to the study. Participant attrition increased during the study.

Results: Knowledge scores increased significantly from baseline in both groups and no significant differences were detected between the scores of the two groups. Skill performance scores were similar in both groups at the 2-week follow-up with significant differences emerging at the 8-week follow-up in favour of the intervention group, however, this finding must be interpreted with caution in light of sample size and attrition rates.

Conclusion: The computer-assisted learning module was an effective strategy for teaching both the theory and practice of handwashing to nursing students and in this study was found to be at least as effective as conventional face-to-face teaching methods.

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Fig. 1. Study design and sample size.
WEB PAPER

A randomized controlled trial of two different types of web-based instructional methods: One with case-based scenarios and one without

ANNE MOUNSEY & ALFRED REID
University of North Carolina, USA

Abstract

Background: Computer-based learning (CBL) is an effective form of medical education. Educators have developed recommendations for instructional design but there is only minimal research that evaluates these recommendations.

Aim: To evaluate the effect of case-based questions contained in computer modules on learning efficacy.

Methods: The authors conducted a randomized controlled trial in 124 medical students of two CBL PowerPoint modules-based on Medicare. The modules were identical except one contained 11 case-based scenarios followed by multiple choice questions. The primary outcome measurement was a previously validated, 11-item knowledge test taken at the end of the module and at the end of the academic year to test retention.

Results: The students who studied the module with case-based questions answered one more item correctly in the first test (8.9 vs. 10.00 correct answers, \( p = 0.001 \)). This difference had disappeared by the time of the second test (4.2 vs. 4.7, \( p = 0.095 \)).

Conclusions: This study shows that computer modules with case-based questions enhance learning in the short-term but at the expense of increased time and so decreased learning efficiency. This learning benefit was not maintained.
Table 1. Demographic characteristics of participating students at the time of the first and second knowledge tests.

<table>
<thead>
<tr>
<th></th>
<th>First test</th>
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<tbody>
<tr>
<td></td>
<td>No. of cases</td>
<td>%</td>
<td>Cases</td>
<td>%</td>
<td>p</td>
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<td>N = 124</td>
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<tr>
<td>Mean age (SD)</td>
<td>27</td>
<td>(3.7)</td>
<td>28</td>
<td>(2.7)</td>
<td>0.390</td>
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<tr>
<td>Gender</td>
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<tr>
<td>M</td>
<td>39</td>
<td>58%</td>
<td>30</td>
<td>53%</td>
<td>0.533</td>
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<td>F</td>
<td>28</td>
<td>42%</td>
<td>27</td>
<td>47%</td>
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<tr>
<td>MD</td>
<td>56</td>
<td>84%</td>
<td>47</td>
<td>82%</td>
<td>0.368</td>
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<tr>
<td>MD–MPH or –PhD</td>
<td>11</td>
<td>16%</td>
<td>10</td>
<td>18%</td>
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<td>Second test</td>
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<td>N = 60</td>
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<tr>
<td>Mean age (SD)</td>
<td>28</td>
<td>(3.0)</td>
<td>27</td>
<td>(1.9)</td>
<td>0.498</td>
<td></td>
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<td>Gender</td>
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<tr>
<td>M</td>
<td>26</td>
<td>70%</td>
<td>9</td>
<td>39%</td>
<td>0.017</td>
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<td></td>
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<tr>
<td>F</td>
<td>11</td>
<td>30%</td>
<td>14</td>
<td>61%</td>
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<tr>
<td>Degree program</td>
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<tr>
<td>MD</td>
<td>33</td>
<td>89%</td>
<td>18</td>
<td>78%</td>
<td>0.249</td>
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</tr>
<tr>
<td>MD–MPH or –PhD</td>
<td>4</td>
<td>11%</td>
<td>5</td>
<td>22%</td>
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</tr>
</tbody>
</table>

Note: p-values are for differences between the group randomized to learning modules with no case examples and to modules with case examples.
Table 2. Differences in mean number of correct responses, mean study time, and mean learning efficiency between the group randomized to learning modules with case examples and those without, at the time of the first and second knowledge tests.

<table>
<thead>
<tr>
<th></th>
<th>First test</th>
<th></th>
<th>Second test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of cases</td>
<td>Cases</td>
<td>Diff.</td>
<td>p</td>
</tr>
<tr>
<td>N</td>
<td>65</td>
<td>57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean number of correct responses (SD)</td>
<td>8.9 (1.86)</td>
<td>10.0 (1.03)</td>
<td>-1.05</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean minutes of study (SD)</td>
<td>9.2 (2.72)</td>
<td>12.6 (3.14)</td>
<td>-3.40</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean learning efficiency (SD)</td>
<td>1.0 (0.34)</td>
<td>0.83 (0.21)</td>
<td>0.21</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Note: *Correct responses per minute of study.
Internet-Based Learning in the Health Professions
A Meta-analysis

David A. Cook, MD, MHPE
Anthony J. Levinson, MD, MSe
Sarah Garside, MD, PhD
Denise M. Dupras, MD, PhD
Patricia J. Erwin, MLS
Victor M. Montori, MD, MSe

The advent of the World Wide Web in 1991 greatly facilitated the use of the Internet and its potential as an instructional tool was quickly recognized. Internet-based education permits learners to participate at a time and place convenient to them, facilitates instructional methods that might be difficult in other formats, and has the potential to tailor instruction to individual learners' needs. As a result, Internet-based learning has become an increasingly popular approach to medical education. However, concerns about the effectiveness of Internet-based learning have stimulated a growing body of research. In the first decade of the Web's existence 35 evaluative articles on Web-based learning were published, whereas at least 32 were published in 2005 alone. Synthesis of this evidence could inform educators and learners about the extent to which these products are effective and what makes them more or less effective.

Context The increasing use of Internet-based learning in health professions education may be informed by a timely, comprehensive synthesis of evidence of effectiveness.

Objectives To summarize the effect of Internet-based instruction for health professions learners compared with no intervention and with non-Internet interventions.


Study Selection Studies in any language quantifying the association of Internet-based instruction and educational outcomes for practicing and student physicians, nurses, pharmacists, dentists, and other health care professionals compared with a no-intervention or non-Internet control group or a preintervention assessment.

Data Extraction Two reviewers independently evaluated study quality and abstracted information including characteristics of learners, learning setting, and intervention (including level of interactivity, practice exercises, online discussion, and duration).

Data Synthesis There were 201 eligible studies. Heterogeneity in results across studies was large (I² = 79%) in all analyses. Effect sizes were pooled using a random effects model. The pooled effect size in comparison to no intervention favored Internet-based interventions and was 1.00 (95% confidence interval [CI], 0.90-1.10; P < .001; n = 126 studies) for knowledge outcomes. 0.85 (95% CI, 0.49-1.20; P < .001; n = 16) for skills, and 0.82 (95% CI, 0.63-1.02; P < .001; n = 32) for learner behaviors and patient effects. Compared with non-Internet formats, the pooled effect sizes (positive numbers favoring Internet) were 0.10 (95% CI, -0.12 to 0.32; P = .37; n = 43) for satisfaction, 0.12 (95% CI, 0.03 to 0.24; P = .045; n = 63) for knowledge, 0.09 (95% CI, -0.26 to 0.44; P = .61; n = 12) for skills, and 0.51 (95% CI, -0.24 to 1.25; P = .18; n = 6) for behaviors or patient effects. No important treatment-subgroup interactions were identified.

Conclusions Internet-based learning is associated with large positive effects compared with no intervention. In contrast, effects compared with non-Internet instructional methods are heterogeneous and generally small, suggesting effectiveness similar to traditional methods. Future research should directly compare different Internet-based interventions.

AMA 2008;300(10):1181-1196

Since 2001, several reviews (some of which also included non-Internet-based computer-assisted instruction) have offered such summaries. However, each had important methodological limitations, including incomplete accounting of existing studies, limited...
Retention

- How can we improve retention of what we teach?
- How can we improve retention of what we learn?

- Visual Images
  - Is a Picture Worth a Thousand Words?
For Whom Is a Picture Worth a Thousand Words?  
Extensions of a Dual-Coding Theory of Multimedia Learning

Richard E. Mayer and Valerie K. Sims

In 2 experiments, high- and low-spatial ability students viewed a computer-generated animation and listened simultaneously (concurrent group) or successively (successive group) to a narration that explained the workings either of a bicycle tire pump (Experiment 1) or of the human respiratory system (Experiment 2). The concurrent group generated more creative solutions to subsequent transfer problems than did the successive group; this contiguity effect was strong for high- but not for low-spatial ability students. Consistent with a dual-coding theory, spatial ability allows high-spatial learners to devote more cognitive resources to building referential connections between visual and verbal representations of the presented material, whereas low-spatial ability learners must devote more cognitive resources to building representation connections between visually presented material and its visual representation.
Rheumatology Visual Pearls

Collection of Rheumatological Images for Internists

From Head to Toe

Images are from Google Images, website given at the bottom of each image
Subtype 1:
FACIAL REDNESS
(erythematotelangiectatic rosacea)
Flushing and persistent redness. Visible blood vessels may also appear.
http://drugline.org/ail/pathography/1727/
ACR Image Bank: www.rheumatology.org
Figure 4. Radiographic classification in the evaluation of sacroiliac joints. Grade 0 – normal (A); grade I – suspicious; grade II – mild irregularity and sclerosis of articular surfaces, with preserved joint space (B); grade III – joint space narrowing, besides intense irregularity and subchondral sclerosis (C); grade IV – bilateral ankylosis (D).
Sunlight exacerbated the rash.
Podagra

thegoutkiller.com
Thank-You

QUESTIONS?