Written or Typed Note-Taking and Memory Retention: Considerations for Electronic Continuing Medical Education

Danielle N. Naumann1,2, Karen M. Smith1, Laura McDiarmid Anton3

1Queen’s University Office of Continuing Professional Development 2Queen’s University School of Rehabilitation Therapy

Statement of Purpose:

- The Office of Continuing Professional Development, Faculty of Health Science at Queen’s University is promoting the use of electronic CME to our learners, and we have developed an innovative electronic platform to CME initiatives.
- As an accredited CME provider, it is important that we understand the effects of note-taking approaches on knowledge retention, reflective behaviors and subsequent content application, so that we may engage our learners in a manner that is associated with better patient care.

Background:

- With advances in technology, there is widespread movement toward the adoption of electronic approaches to supplement CME and faculty development education, and there are currently a range of technologies that are embedded in most CME.
- Health care professionals are increasingly using mobile technology (i.e. laptops, netbooks, tablets and iPads) to take notes during medical education events.
- For learners who are comfortable with technology the incorporation of electronic approaches to CME has greatly enhanced their learning experiences.
- But not all health care professionals are intuitively able to use emerging technology, and prefer to engage in traditional approaches to CME.
- Emerging research suggests that learners who take electronic notes may not engage in as much content reflection as those who take written notes, however, many clinicians take notes electronically when completing CME offered through electronic platforms.

"Is there existing evidence of an effect of note-taking style on the retention of information provided through electronic CME?"

Methods: Scoping Review (Arksey & O'Malley, 2005)

- Preliminary literature search yielded no research specifically pertaining to the topic of note-taking style on memory retention in relation to CME.
- York Scoping Review Methodology is commonly used to map key concepts and relevant literature in areas of research not comprehensively reviewed previously.
- Comprised of a clearly defined 6-stage framework:

1. **Identify the research question:**

   "Is there existing evidence of an effect of note-taking style on the retention of information provided through electronic CME?"

2. **Identify relevant literature**

   - Databases searched: PubMed, PsychInfo, MedLine, Google Scholar, Web of Science, Google, Queen's University Summon's search (library search tool)
   - Key words: memory; retention; recall; note-taking; writing; typing; notes; written; pen; computer.
   - Select journals hand-searched
   - Reference sections of key articles and-searched
   - Key authors contacted directly

3. **Select relevant literature**

   - 56 selected for detailed review
   - Articles excluded based on language, redundancy, applicability of content

4. **Chart Data**

   - Data were charted and categorized according to the grounding approaches taken in the studies.
   - Key terms were pulled from the data, and each article summarized for further analyses.

5. **Collate, summarize & report results**

   - Data were analyzed using the qualitative analysis tool NVivo10

6. **Consult with key stakeholders**

   - Key authors in emerging literature were directly contacted and provided guidance throughout the scoping review.

Results:

<table>
<thead>
<tr>
<th>Disciplinary Focus</th>
<th># Publications*</th>
<th>Key Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology</td>
<td>28</td>
<td>Writing skills; executive functioning; load; cognition; working memory; learning; planning; encoding</td>
</tr>
<tr>
<td>Education</td>
<td>16</td>
<td>Fluency; generative learning; recall; encoding</td>
</tr>
<tr>
<td>Cognition</td>
<td>13</td>
<td>Levels of processing; transfer; long-term retention</td>
</tr>
<tr>
<td>Memory</td>
<td>12</td>
<td>Directed forgetting; information suppression; rehearsal</td>
</tr>
<tr>
<td>Computers/Technology</td>
<td>11</td>
<td>Multitasking; distraction; typing speed; divided attention; limited capacity</td>
</tr>
<tr>
<td>Writing Research</td>
<td>6</td>
<td>Fluency; linguistic encoding; verbal/visual working memory</td>
</tr>
<tr>
<td>Behavioral Science</td>
<td>2</td>
<td>Verbal working memory; syntactic processing; conscious controlled processing</td>
</tr>
<tr>
<td>Medicine</td>
<td>1</td>
<td>Distraction; documentation; computer use</td>
</tr>
</tbody>
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*note: many publications fit into two distinct disciplinary categories, e.g. "educational psychology"

Conclusions:

- There is no research that has compared the impact of note-taking style on memory retention as it pertains to CME.
- Further research needs to examine the effects of note-taking style during electronic CME events on information retention and application, in order to inform our recommendations for physician participants in our CME events.

References

[Insert references here]