

TOWARD TESTING THE RELATIVE EFFICACY OF HANDWRITTEN OR ELECTRONICALLY-GENERATED STUDENT CLASSROOM NOTES

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ABSTRACT

Note-taking (NT) involves listening, assimilating, and recording ideas. About 94% of college students think note-taking is critical to learning. Hand-writing notes results in external *storage*, and aids *encoding* of ideas in memory. Both roles, separately, increase recall [3]. As traditional classrooms are replaced with “e-classrooms,” many students bring laptops for NT. Some instructors have become concerned with an apparent decline in student learning, concurrent with the advent of student laptops.

Electronic NT research has focused on note-sharing or “capturing” the class (video/auditory recording) [4]. An MRI study [2] found handwriting and typing involve different brain areas. While writing *necessitates* activation of cognitive centers, typing does not. One can choose to think *and* type, but one may type on “auto-pilot”. While hand NT affects both internal and external information storage, electronic NT may only work for external recording. Previous research failed to measure differences in recall following NT by either hand or electronic means, so we tested their relative efficacies.

METHODOLOGY/RESULTS

Student volunteers from a basic business class self-selected NT method(s), but were allowed to change between classes. Three related exam essay questions covered market segmentation, research, and buyer behavior. Students were unaware which topics and/or class periods were part of the study. ANOVA showed handwritten NT resulted in significantly higher essay scores than did electronic NT ($F_{1,60} = 4.33, p < .05; \bar{x}_{\text{hand}} = 78.40\%, \bar{x}_{\text{electronic}} = 68.17\%$). Scores also significantly differed between questions/topics ($F_{1, 60} = 4.63, p < .05$). The NT Method X Question interaction was not significant. Regardless of nature of the material/question, taking notes by hand produced higher recall. Interestingly, *choice* of note-taking method was significantly related to previous GPA ($r = .20, t = 2.30, p < .05$), with those handwriting notes having higher GPA's than those choosing an electronic NT method.

REFERENCES

- [1] Dunkel, P. and S. Davy. Heuristic of Lecture Notetaking: Perceptions of American & International Students Regarding Value & Practice of Notetaking. *English for Specific Purposes*, 1989, 8, 33-50.
- [2] Katanoda, Kota, Kohki Yoshikawa, and Morihiro Sugishita (2001), “A Functional MRI Study on the Neural Substrates for Writing,” *Human Brain Mapping*, 13, 34-42.
- [3] Kiewra, Kenneth A. (1989), “A Review of Note-Taking: The Encoding-Storage Paradigm and Beyond,” *Educational Psychology Review*, 1:2, 147-72.
- [4] Rekimoto, Jun (1998), “A Multiple Device Approach Supporting Whiteboard-based Interactions,” *Proceedings of SIGCHI Conference on Human Factors in Computer Systems*, Los Angeles, CA.