

Dan Cohen's Digital Humanities Blog » Blog Archive » No Computer Left Behind

In this week's issue of the *Chronicle of Higher Education*^[1] Roy Rosenzweig and I elaborate on the implications of my H-Bot software^[2], and of similar data-mining services and the web in general. "No Computer Left Behind"^[3] (cover story in the Chronicle Review; alas, subscription required, though [here's a copy at CHNM](#)^[4]) is somewhat more polemical than our recent article in *First Monday*^[5] ("Web of Lies? Historical Knowledge on the Internet"^[6]). In short, we argue that just as the calculator—an unavoidable modern technology—muscle its way into the mathematics exam room, devices to access and quickly scan the vast store of historical knowledge on the Internet (such as PDAs and smart phones) will inevitably disrupt the testing—and thus instruction—of humanities subjects. As the editors of the *Chronicle* put it in their headline: "The multiple-choice test is on its deathbed." This development is to be praised; just as the teaching of mathematics should be about higher principles rather than the rote memorization of multiplication tables, the teaching of subjects like history should be freed by new technologies to focus once again (as it was before a century of multiple-choice exams) on more important principles such as the analysis and synthesis of primary sources. Here are some excerpts from the article.

"What if students will have in their pockets a device that can rapidly and accurately answer, say, multiple-choice questions about history? Would teachers start to face a revolt from (already restive) students, who would wonder why they were being tested on their ability to answer something that they could quickly find out about on that magical device?

"It turns out that most students already have such a device in their pockets, and to them it's less magical than mundane. It's called a cellphone. That pocket communicator is rapidly becoming a portal to other simultaneously remarkable and commonplace modern

technologies that, at least in our field of history, will enable the devices to answer, with a surprisingly high degree of accuracy, the kinds of multiple-choice questions used in thousands of high-school and college history classes, as well as a good portion of the standardized tests that are used to assess whether the schools are properly “educating” our students. Those technological developments are likely to bring the multiple-choice test to the brink of obsolescence, mounting a substantial challenge to the presentation of history—and other disciplines—as a set of facts or one-sentence interpretations and to the rote learning that inevitably goes along with such an approach...

“At the same time that the Web’s openness allows anyone access, it also allows any machine connected to it to scan those billions of documents, which leads to the second development that puts multiple-choice tests in peril: the means to process and manipulate the Web to produce meaningful information or answer questions. Computer scientists have long dreamed of an adequately large corpus of text to subject to a variety of algorithms that could reveal underlying meaning and linkages. They now have that corpus, more than large enough to perform remarkable new feats through information theory.

“For instance, Google researchers have demonstrated (but not yet released to the general public) a powerful method for creating ‘good enough’ translations—not by understanding the grammar of each passage, but by rapidly scanning and comparing similar phrases on countless electronic documents in the original and second languages. Given large enough volumes of words in a variety of languages, machine processing can find parallel phrases and reduce any document into a series of word swaps. Where once it seemed necessary to have a human being aid in a computer’s translating skills, or to teach that machine the basics of language, swift algorithms functioning on unimaginably large amounts of text suffice. Are such new computer translations as good as a skilled, bilingual human being? Of course not. Are they good enough to get the gist of a text? Absolutely. So good the National Security Agency and the Central Intelligence Agency increasingly rely on that kind of

technology to scan, sort, and mine gargantuan amounts of text and communications (whether or not the rest of us like it).

“As it turns out, ‘good enough’ is precisely what multiple-choice exams are all about. Easy, mechanical grading is made possible by restricting possible answers, akin to a translator’s receiving four possible translations for a sentence. Not only would those four possibilities make the work of the translator much easier, but a smart translator—even one with a novice understanding of the translated language—could home in on the correct answer by recognizing awkward (or proper) sounding pieces in each possible answer. By restricting the answers to certain possibilities, multiple-choice questions provide a circumscribed realm of information, where subtle clues in both the question and the few answers allow shrewd test takers to make helpful associations and rule out certain answers (for decades, test-preparation companies like Kaplan Inc. have made a good living teaching students that trick). The ‘gaming’ of a question can occur even when the test taker doesn’t know the correct answer and is not entirely familiar with the subject matter...

“By the time today’s elementary-school students enter college, it will probably seem as odd to them to be forbidden to use digital devices like cellphones, connected to an Internet service like H-Bot, to find out when Nelson Mandela was born as it would be to tell students now that they can’t use a calculator to do the routine arithmetic in an algebra equation. By providing much more than just an open-ended question, multiple-choice tests give students—and, perhaps more important in the future, their digital assistants—more than enough information to retrieve even a fairly sophisticated answer from the Web. The genie will be out of the bottle, and we will have to start thinking of more meaningful ways to assess historical knowledge or ‘ignorance.’”

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References

1. ^ [Chronicle of Higher Education](#) (chronicle.com)
2. ^ [H-Bot software](#) (chnm.gmu.edu)
3. ^ [“No Computer Left Behind”](#) (chronicle.com)
4. ^ [here's a copy at CHNM](#) (chnm.gmu.edu)
5. ^ [First Monday](#) (firstmonday.org)
6. ^ [“Web of Lies? Historical Knowledge on the Internet”](#)
(firstmonday.org)
7. ^ [View all posts in Academia](#) (www.dancohen.org)
8. ^ [View all posts in History](#) (www.dancohen.org)
9. ^ [View all posts in Information Theory](#) (www.dancohen.org)
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