

## Hi-tech e-texts for higher ed ahead

**V**IRGINIA Commonwealth University students use a “textbook” that exists only in cyberspace. It directs them to related Web sites, has recorded lectures that they can replay, and provides chat areas that supplement classroom discussions. At Kent State University, students receive electronic books, loaded with e-texts for certain courses. In Texas, the State Board of Education had a pilot program to distribute electronic books and laptop computers to thousands of high school students for use in place of textbooks.

Students at several dental schools do not go to the bookstore to buy a single textbook, workbook, or laboratory manual. A four-year dental school curriculum is being recorded onto a single DVD—textbooks, manuals, and lecture slides—for all four years of dental school. Each semester, students will trade the old DVD for an updated version. The DVDs will replace more than 2 million pages, thousands of images, and more than 400 pounds of books and manuals. The DVD contains all of the textbooks, course syllabi, handouts, and most of the images that faculty will be using through the entire curriculum. The disks include four times as much material as students are typically asked to purchase. A DVD with updates will cost about the same as the total for all the books, \$3,000 – \$6,000, paid over time.

Publishers are digitizing thousands of textbooks, manuals, and professors’ handouts to be included in the DVDs. By clicking on each page, students turn pages as if they were reading a printed book. Students will be able to create online libraries with content they wish to link together, like chapters from several books that are related to the same topic.

E-book technology is advancing rapidly, with better screen resolution and longer battery life. The cost of such devices is dropping and electronic readers are on the market for \$300 to \$500 each. All of them allow downloading of texts from the Internet, permitting students to “carry” many books in one lightweight device. The devices allow text searches and have built-in dictionary and thesaurus functions.

A generation is coming of age for whom digital information is easy and natural. Few

older people seem ready to curl up with a hand-held screen for reading a novel, but the idea of reading textbooks or reference material from screens is becoming common. Computers are an integral part of higher education, especially for reference works. Texts for physicians, lawyers, and other professionals are now online, where they can be searched and updated with greater ease and at lower cost than with printed texts. A growing number of textbooks have online supplements for graphics, pictures, and video and audio supplements.

The market for educational texts was more than \$5 billion last year, and the Internet has only expanded the market. Educators and electronic publishers have talked for years about the advantages of creating digital replacements for quickly outdated printed textbooks. Digital-textbook experiments have shown that students facing a lot of reading prefer printed books. However, the ease of searching digital information may be more appealing to students who often use their textbooks as references to be read in short chunks instead of as continuous text, chapter by chapter. In electronic textbooks, color can be used with almost no added cost.

The Internet and e-texts may transmit information, but conveying knowledge is a much bigger job. Knowledge comes from understanding the context of information, seeing it in practice and learning the things that are tacitly understood but rarely stated. The electronic textbook will be only one option in the way we communicate and it is more likely to work in conjunction with digital printing as students search for information but then print it for reading.

### DID YOU HEAR?

- A test of the theory that “an infinite number of monkeys and an infinite number of typewriters” will eventually produce the works of Shakespeare failed to produce a single word. The monkeys were more complex than random generators. However, 525 high-level primates did once produce the U.S. tax code.
- From the *Scottish Daily Record*, the most widely spoken languages in the world are:

|                     |             |
|---------------------|-------------|
| 1. Mandarin         | 1 billion   |
| 2. English          | 508 million |
| 3. Hindustani       | 497 million |
| 4. Spanish          | 293 million |
| 5. Russian          | 277 million |
| 6. Arabic           | 246 million |
| 7. Bengali          | 211 million |
| 8. Portuguese       | 191 million |
| 9. Malay-Indonesian | 159 million |
| 10. French          | 129 million |
- GAMA-NH estimates that 45 billion PDFs move over the Internet annually—12 billion downloaded from web sites and 33 billion PDFs via email. They represent 153 billion pages that move over the Internet annually—35 billion downloaded from web sites and 118 billion pages via email. This does not consider Word, Powerpoint, and Excel files that are transferred, which could be an equal amount. At one time, all of those pages were printed out in some form.
- The Federal Government’s print spending has declined from \$1 billion in 1999 to under \$400 million this year, says newly-appointed Public Printer Bruce James.
- Of all mail origination (by weight): Printing industry, 50%; Corporate/Inhouse, 40%; Individual, 10% (Sloan Printing Industry Center at RIT).
- In the past year, 1,600 titles were downloaded more than 3.1 million times at the Etext Library at the University of Virginia. That’s 8,715 free e-books per day.
- At the Stanford Linear Accelerator Center (SLAC), the BABAR database stored its 500,000th gigabyte recently—a milestone that makes it the world’s largest database.
- Hang up that phone and stop scheduling meetings—80% of business people prefer e-mail communication, according to a survey by META Group, Inc. Spam not included.

## Fast facts

- Before Gutenberg invented moveable type in 1440, there were about 30,000 books throughout all of Europe, mostly religious in nature. By 1500, there were about 9 million books. Today there are almost two trillion books. The world's libraries store more than 100 million original volumes, 28 million in the U.S. Library of Congress. About 70,000 book titles are published annually in the U.S.
- Oxford University was founded in the mid-12th century; New College, Oxford was founded around the late 16th century. It has a great dining hall with big oak beams across the top—eighteen inches square, twenty feet long. Ten years ago, an entomologist went up with a penknife and found that they were full of beetles. This was reported to the College Council and met with some dismay—where would they get beams of that caliber? They called the College Forester and asked about oaks. It seems that when the College was founded, a grove of oaks had been planted to replace the beams in the dining hall when they became beetly, because oak beams always become beetly. This plan had been passed down from one Forester to the next for four hundred years. How many companies have the foresight to plan that far ahead?
- *The last issue incorrectly had 52, not 50, stars on the U.S. flag. We salute those who caught it.*

## EDSF REPORT

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## The pig in the python

At a Canadian XPLOR meeting, Bill Broddy of Prinova presented the hypothesis that digital printing was born and will die with the baby boom generation. The "baby boom" ran from 1946 to 1964. During those 19 years, 76 million Americans were born. The magnitude of this occurrence has had a major impact on our economy over the last 50 years and has determined the size and composition of the labor force. In the 1970s elementary and high school populations reached their all-time high. In 1978, when baby-boomers were aged 15 to 32, they made up almost 45 percent of the labor force. Between 2009 and 2029 they will retire.

Today boomers are between 40 and 58 years of age. They receive the majority of first class mail and the majority of direct mail. They are the main focus of customer relationship marketing. They had access to new investment and retirement plans from the time they started working and are still a market for new financial services. Almost all own homes, which are appreciating in value. And their parents—the generation that survived the Depression and World War II—are passing on their "wealth." Boomers are, in general, healthier, better educated, technically savvy, and they have disposable incomes. The boomers are a definable market.

The number of documents that they receive has been growing in volume and page count. From credit card statements, to phone, water, electricity and other bills, to pension and brokerage statements, they receive tons of printed materials. Why would they receive more pages per document? Point size! Statements and direct mail are using larger type to cater to boomer eyesight.

Why did the stock market boom? Why did the real estate market collapse? What's the best way to prepare for a secure, happy retirement? In the book "The Pig and the Python: How to Prosper from the Aging Baby Boom," the authors trace the changes in U.S demographics by following the bulge in the boomer population just as a python digests its dinner. We may even see the evolution of digital printing.

1960s: The boomers were in their teen years with more disposable income than any other generation. They spent it mostly on goods—clothes, recorded music, entertainment, and junk food. Print technology used pre-printed forms and impact printing—junk print, if you will.

1970s: Boomers were in high school and college and some were leaving home—they began to get jobs, credit cards, insurance policies, apartments, and starter homes. Toward the end of the decade high-end 300dpi digital printing appeared.

1980s: Boomers started families of their own, took out insurance policies, moved into middle management, and began to receive more direct mail. Printing technology advanced to PostScript and 600dpi. They dealt with more and more paper.

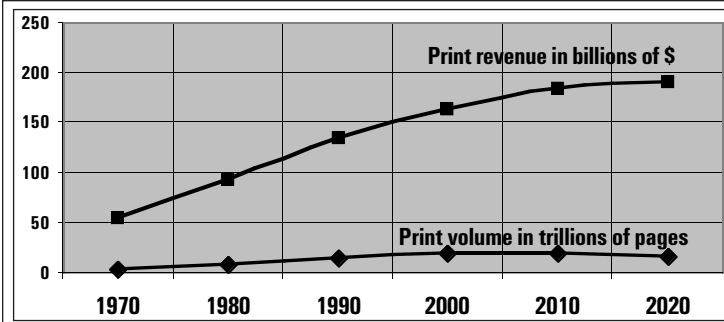
1990s: They were the first generation to master computers, apply the cell phone, acquire gadgets. They also invested in mutual funds. Digital printing added color; mail volume increased.

2000s: The kids are almost gone. The pensions are a little soft because of the economy, but boomers are starting to plan retirement at age 62 beginning around 2007. Direct mail has more color.

The growth in digital printing is only one aspect to track over this period. One can plot the growth in all printing over this same period. The boomers were the spark for the economy over the last 50 years. They are a paper-based generation, but they are increasingly using computers.

22 million of the 25 million people, who will leave the labor force between now and 2008, will be aged 45 years or older. The total number of people who left the labor force the previous decade was 19 million. After 2008, as more and more baby boomers reach retirement age, the impact of their retirements will grow. There will be many jobs without a potential worker. Beginning in 2000, the normal retirement age for collecting a full Social Security pension increased by gradual increments from 65 years and 2 months to 67 years in 2022. The amount of reduced pension benefits one can collect at age 62 was also lowered. Congress also eliminated the earnings limit on the amount that Social Security recipients between the ages of 65 and 69 can earn before having to forfeit part of their Social Security benefits. These rule changes may keep people in the workforce longer. The supply of workers may start to improve because immigration is projected to increase and the birth rate went up from 1979–1994 with the "baby-boom echo." These trends will provide more workers for a dwindling U.S. labor force.

There are about 50,000 people in the U.S. who are now 100 years of age; within ten years there will be 100,000, and within 50 years, over 1 million. By 2010, there will be as many century seniors as there are people under the age of 20. An important component of the elder boomers' ability to achieve extreme age is their high level of education, income, and attention to good health habits. Thus, the boomers will be a market for goods and services for a long time. If you were going to invest based on the boomer generation, consider Florida real estate. Boomers will need a place to retire.



Over the next two decades the volume of pages reproduced by commercial printing firms will decline. An increasing amount of pages will find their way to electronic formats and electronic distribution and this will adversely affect paper-based reproduction. At the same time, the revenue for those firms will increase slightly—not because of higher print pricing, but because of additional value-added services offered by the printing services. These new services include fulfillment, mailing, facilities management, and digital asset management, among others. Chart by RIT/Romano.

## READER OF THE PACK

The textbooks and stuff an eighth-grader carries to and from school are so heavy (28 pounds plus) they strain backpacks. California’s governor signed a bill banning textbooks exceeding a weight limit, and legislators in other states introduced similar bills.

Textbooks grew heavier over the past decade as officials imposed curriculum requirements on publishers, who enlarged page sizes and stuffed texts with color and graphics. School officials trying to eliminate stash points for weapons and drugs removed lockers, which forced students to carry their belongings to every class and home.

California spends more on textbooks than any other state, about \$354 million, 13% of the total \$2.7 billion U.S. market. Many publishers make California’s regulations the focus in designing textbooks. The Association of American Publishers said that textbooks had become bigger, blaming states with extensive curricular rules. Publishers considered printing on lighter paper and binding with flimsier materials, but found weight savings would be insignificant with a loss in durability.

Some want publishers to make textbooks into multiple volumes, which would add to a book’s cost. One approach was rolling backpacks, but districts have banned them. Plans to issue two textbooks per student, one for school, another for home, was too costly.

But heavy backpacks don’t cause back pain, says a University of Michigan study. Third grade students carried an average of 5.7% of their body weight in their packs, while middle school students carried backpacks equal to 11.4% of their body weight. Students’ body mass index increased from the third graders to middle schoolers—middle schoolers were more obese. The percent of students who walked or biked to school dropped dramatically in the older kids, so they’re less active—watching more TV and playing computer games. Maybe heavy book bags are not a bad idea.

## New skills versus old skills

The Internet was predicted to be the end of many industries, as bricks-and-mortar entities gave way to clicks, or clicks and mortar. It might also be the end of the university as we know it, because online learning will bring the Ivory Tower down to the Ivory Desktop. Books will be affected as will all forms of paper-based communication. But education must adapt to changes in the workforce. We must train and educate the workforce of tomorrow for the workplace of tomorrow:

1. Enhanced customer service orientation: This will require more access to information about a customer so that service workers can respond to their needs faster and more efficiently.
2. The vital need for workers to stay current: On-the-job training will be vital as the nature of the jobs change. By 2008, workers’ knowledge will be obsolete every eight months.
3. New and more advanced skills: Workers will have to learn and apply new methods and technologies on a frequent basis. They will have to learn how to learn.
4. Better problem-solving skills required: Workers of the future will have to make decisions faster, often based on incomplete data. Having access to information is no substitute for good problem-solving skills—thinking through a problem instead of working it through.
5. Project management skills: Workers will have to track their progress and meet varying schedules and demands. New tools will be required to accomplish this.
6. Team approach and excellent inter-personal skills: New approaches to cyber-teams will necessitate cooperation and collaboration across networks.
7. Computer skills across multiple occupations: The computer and the use of the computer will be the basic skill for all workers no matter what they do or where they do it.
8. Steady demand for information workers: Call them “information” or “knowledge” workers—there will be a need for people who work in knowledge-based jobs and environments.

## New media versus old media

New research confirms that traditional forms of media are holding their own against the Internet, and readership of newspapers has increased by 7% since 2000. Conducted by Vertis, the study also reveals that prime time TV continues to be the primary source of news and information for consumers:

|                         | 2000 | 2002 |    |
|-------------------------|------|------|----|
| Watched Prime Time TV   | 82%  | 87%  | Up |
| Read the Newspaper      | 71%  | 78%  | Up |
| Listened to AM Radio    | 66%  | 70%  | Up |
| Read Ad Insert/Circular | 61%  | 67%  | Up |
| Read a Magazine         | 60%  | 63%  | Up |
| Read a Billboard        | NA   | 59%  |    |
| Read Direct Mail        | NA   | 51%  |    |
| Read a Catalog          | NA   | 46%  |    |
| Surfed the Internet     | 32%  | 40%  | Up |
| Talked to Telemarketer  | NA   | 19%  |    |

(NA = Not tracked by Vertis at that time.)

It has been suggested that the Internet is chipping away at traditional forms of media usage and communication. However, the Vertis findings show that although Internet usage has increased by eight percent from 2000 to 2002, consumer use of TV, newspapers, and radio has increased at a comparative level. Old media is holding its own against new media.

## READIN', WRITIN', & TVIN'

A report from the *National Commission on Writing in America's Schools and Colleges* found that most fourth graders spend less than three hours a week writing, which is about 15% of the time they spend watching television. Seventy-five percent of high school seniors never get a history or social studies writing assignment. The research paper, once a high school senior-year requirement, has been abandoned because teachers do not have time to grade it. On the National Assessment of Educational Progress exam, only about one in four students in Grades 4, 8, or 12 scored at the proficient level in writing in 1998. Only one percent were graded "advanced." The commission says that writing is among the most important skills students can learn, that it is the mechanism through which they learn to assimilate knowledge. "If students are to make knowledge their own, they must struggle with the details, wrestle with the facts, and rework raw information and dimly understood concepts into language they can communicate to someone else," the report said. "In short, if students are to learn, they must write." Grammar checkers won't help.

## POD is really PDQ

Let's be honest: there is no such thing as the "On Demand Printing" or "Print On Demand" market. If anything, "on demand" is a euphemism for digital printing. And digital printing eliminated two of the impediments to printing production: makeready and drying. Thus, printing jobs could be produced in shorter runs and with shorter schedules. Sum it up: we got short run and short time printing.

How would you even measure the POD market? Should you count every copy that comes out of every digital printer? And why stop at digital printers; should we count all copier output? Wait: should we not count all printing where makeready is under 15 minutes? That's a lot of what is printed, both commercially and inhouse. The POD market *is* the printing industry and the corporate reprographics world *combined*.

But we know that it is not.

Yet there are now many research reports, three e-mail newsletters, one trade show and conference, numerous seminars, and two organizations covering POD or On-Demand. Think: all this is based on the fact that customers can get their printing faster and in shorter runs. Fast food is therefore an on-demand market. Portapottys are also for an on-demand activity.

When we place a value upon this illusory market, we wonder how one would do it. Do you count all black and white and color toner and inkjet printing? Does my little desktop inkjet count? I use it to produce documents when I need them. That's on-demand. The entire commercial printing industry is about \$150 billion (PIA, 2002). It might be logical to count all digital printing (and copying) produced by these firms.

Then you have to count all the digital printing (and copying) done inside corporations. How do you place a value on what they produce? Assume that it would have been done by a commercial printer and price it accordingly? How about my little printer? Can you place the same value on what I produce with it?

The best guess about POD revenue that we have seen is \$400 billion for the value of all printing by any means in the U.S., if all was valued as though it was commercial printing. We are pretty sure that the real commercial part is \$150 billion—the other \$250 billion is debatable.

We could call the market digital printing, but markets should be defined by what is done, not how it is done. It is really the "now" market, as in "I want it now."

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