

"He who seeks intelligence, lacks intelligence." - Friedrich Nietzsche

Finding Intelligent Life Online

by George Lorenzo

A Nuclear Information Explosion

When responding to a question about what should be foremost on the minds of higher education presidents, provosts, and CIOs, University of Pennsylvania Professor Robert Zemsky explained that it is vitally important to recognize that there is a "nuclear" information explosion happening today that has no discernable center and consists of constantly radiating energy moving outward. This expansive energy is changing how colleges and universities manage research agendas, access information, and operate libraries, bringing in its wake enormous challenges that need to be dealt with immediately.¹

This explosion is evident within new and constantly changing web-based communications and information dissemination tools and practices, along with the ways in which academic libraries and scholarly research agendas are changing today. Plus, fully understanding the implications of all this change and predicting what's going to happen next are pretty much impossible.

A succinct picture of the many facets and challenges of the information explosion is presented in this special *Educational Pathways* report. Additionally, this report includes information about how the information explosion is altering teaching, learning and research.

Who's Participating?

Each month since May 2005 the EDUCAUSE Learning Initiative (ELI) "7 Things You Should Know About" series has featured a new web-based learning technology and practice that has entered the mainstream, ranging from social bookmarking, podcasting, and video blogging to the latest on mashups, YouTube, Google Earth, and everything in between.² The articles in the ELI series are representative of a good number of innovative and new developments occurring in online communications and information technologies. For those who are interested in regularly following today's nuclear information explosion, there are numerous other online publishers who also focus on keeping us updated on a regular basis.³

Obviously not everyone has a keen understanding of how all

these technologies work, nor the time to figure out precisely how they may or may not be utilized to our advantage. For example, the overall effectiveness and meaningfulness of the so-called "participatory web," - which is having its own nuclear explosion of online multi-user communities and networks - remains to be seen. The participatory web is driven primarily by user-generated content and consists of blogs; wikis; social bookmarking websites; social networks; aggregator websites that post and rank information with algorithms based on reader-consensus; and numerous other types of community-based searching, tagging, ranking, and information-dissemination functions and tools.

The big question lurking in the background is how many users are actually participating in the participatory web?

In most online communities, 90 percent of users are lurkers who never contribute, nine percent of users contribute a little, and one percent of users account for almost all the action (referred to as the 90-9-1 rule and/or Participation Inequality).⁴

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Due to the extreme vastness of the World Wide Web, a substantial amount of valuable information and shared knowledge resides within the parameters of the web's 90-9-1 rule. The challenge is finding it. According to Technorati.com - which tracks and provides a search engine of the blogosphere - 100,000 new blogs are created worldwide on a daily basis. As of December 2006, there were more than 60 million blogs, with 55 percent of them active. Additionally, "just 38 percent of the 1.4 million individual blog entries each day are in English."⁵

According to some experts, the Web itself increases in size anywhere from seven to ten million pages per day. And it has been estimated that the entire content of the World Wide Web will be more than 50 percent non-English by 2008.⁶ Trying to accurately keep track of all of that will give anyone a severe headache.

Finding Intelligent Life

Despite such information-overabundance conditions, in myriad forms, anyone with strong information fluency skills can find intelligent life online. In addition to the scholarly research that the virtual library catalogs and information fluent librarians are capable of serving up to faculty and students, there are massive amounts of informative, research-based knowledge residing within the online halls of the academic blogosphere. But the academic blogosphere, like everything else on the web, is buried inside an extremely vast online "niche nation," also known as the "Long Tail."^{7,8} And one of the challenges when surfing through the Long Tail, which in many ways can also be viewed as a vast wasteland, is

to learn how to winnow out the good information from the bad. This requires time and effort, strong critical thinking skills, and, when possible, getting help from smart individuals who are willing to share their trusted sources of information.

In a past issue of *Educational Pathways* worth repeating here, we referred to George Siemens's point of view about deriving meaning from a network:

Information and knowledge are so abundant that we can't process them ourselves anymore. Even if I'm an expert in a particular field, I'm unable to process the sheer quantity of knowledge that's being generated by that space. So I have to start offloading the processing of this knowledge and attempt to derive meaning from all this knowledge into a network of trusted colleagues, a network of trusted friends, a network of trusted blogs, [and/or] a technology-enabled network.⁹

Search Engine Companies and Academe

Trust-building, by making online search results more authoritative, is very much on the minds of all the major search engines as their business models continue to evolve. Google Search and Microsoft Live Search, for instance, both claim they are conducting research and developing ways to effectively filter through the enormous amount of user-generated content available online. Their goal is to present their users with the more authoritative and trustworthy search results that emanates from this content.¹⁰

For trust building on the academic side of life, Google continues to develop its mass digitization

projects with its "Book Search" and "Scholar" initiatives, and Microsoft has its "Windows Live Academic" and "Windows Live Books Search," all of which are in Beta. Through these mass digitization initiatives, Google and Microsoft are working at winning over the hearts and minds of librarians, publishers, and higher education, in general.

As of March 2007, 13 higher education institutions have partnered with Google Book Search to digitize vast quantities of books from their libraries' holdings. In addition, Google Scholar has a Library Links program where partnering academic libraries are able to make their licensed resources available, through link resolver technology, to any of their authenticated patrons who would prefer to conduct online research through Google Scholar.¹¹

At Microsoft, the academic-oriented agenda is focused on answering online search questions better by analyzing how its users conduct online queries. Microsoft says it is working on developing methods and functions that would bring more authoritative and trusted search results, from vetted books and academic journals, for instance, that can answer those queries more intelligently.¹²

These types of search engine technology research and development projects have generated enthusiasm among academic libraries whose missions continue to center on making information available in support of scholarship activities. The new era of mass digitization, for instance, has generated useful lines of discussion around what an academic search should look like and how scholars visualize information. Questions about how scholars can utilize vast scores of information are becoming part of a national

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and international dialogue that is exploring the future of scholarship.¹³

The Library of Tomorrow

In short, college and university libraries are striving for a better understanding of what really constitutes scholarly research in a digital age. Like all of higher education, libraries are in the process of figuring out the best ways and methods for discovering and sharing intelligent, trustworthy information that is already published, or publishable, online.

It is also interesting to note that, due to the growth of mass digitization and new communications and information technologies, higher education library physical spaces are changing into socially interactive learning environments where books are not as prevalent as they have been in the past. This point was brought out, anecdotally, in a series of Association of American Universities workshops in which leaders at research institutions were asked about their plans to build more libraries. The general consensus was that newly built libraries would not be shelving as many books in their primary physical space as they have in the past, with vast quantities of their holdings being moved into off-campus high-density, retrievable storage facilities. Then, the question became "What are you going to put in your libraries?" The common denominator was a coffee shop.¹⁴

In a sense the library was becoming a people place that provided the tools, the services, the expertise to support learning and scholarship, but along with that, an environment for social interaction. So it raised the obvious question of what is

the university library in the digital age.¹⁵

The answer is akin to the old cliché that the more things change the more they stay the same:

Because of the wealth of online materials, many scholars can do their research and writing anywhere, yet ironically we find ourselves going to the library no less frequently than we did before. We go for help with using online resources and to learn about software that supports our scholarship. . .¹⁶

Only now they can also grab a cup of coffee and connect with like-minded colleagues in a more socially interactive space.

On Cyberinfrastructure

The growth of what many educators call the "cyberinfrastructure" (CI) is another area worth noting that is very much related to the support of scholarship in our nuclear explosive world, where researchers and information technologists face the challenge of effectively gathering, sharing, and managing petabytes of information and data online. The director of the National Science Foundation (NSF) noted that the development of CI may well usher in a technological age that dwarfs anything we have yet experienced in the current information age. It promises an enormous transformational leap in its scope and power.¹⁷

The short definition of CI is that it's

more than just hardware and software, more than bigger computer boxes and wider pipes connecting them. The term was

coined by NSF to describe the new research environments in which high-performance computing tools are available to researchers in a shared network environment.¹⁸

The development of CI began in the hard sciences and engineering and has since become equally applicable in the humanities and social sciences. CI has the potential for changing scholarship, teaching and learning in profound ways through the creation of virtual organizations responsible for managing, reusing and compiling observational data, and data produced as a result of modeling, simulations, and other kinds of analysis.¹⁹

For example, there is the U.S. National Virtual Observatory (NVO), which is a partnership among astronomers and information technologists that is

developing a set of online tools to link all the world's astronomy data together, giving people all over the world easy access to data from many different instruments, at all wavelengths of the electromagnetic spectrum from radio to gamma rays.²⁰

The NVO is a good example of CI being utilized in what can be considered a sophisticated "cyberlearning" environment, as its data and online tools, which are the same being utilized by professional astronomers all over the world, are being pushed directly into K-12 and higher education classrooms, both face-to-face and virtually.²¹

Teaching and Learning

NVO reveals how large amounts of information and data, mined

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and managed through partnerships within one discipline - astronomy - can be harnessed for the construction of fascinating teaching and learning environments, but NVO is only one small example in our explosive information universe. Plus, the future growth of CI is in a very early stage of development.

In many other feasible and doable means and ways, and in many other disciplines, educators, instructional technologists and designers can unite communications and information technologies with learning through the integration of technology, information literacy and the needs and preferences of today's students, especially the Net Generation. For example, virtual games, computer simulations, and virtual worlds, which appeal to Net Generation students, as well as adults, are being incorporated into new teaching and learning environments because of their capacity to present problem-solving scenarios, have active-learning elements, and can be collaborative in nature with multiple users striving for similar learning goals. One suggestion is for librarians, faculty and instructional technologists to create information fluency tutorials inside virtual games with computer simulations and virtual worlds that teach users how to find, access and evaluate information resources.²²

A Modern Course

An interesting illustration of this kind of new integration can be found in an undergraduate "Participatory Media" course taught by Professor John Schoot in the Carleton College Cinema and Media Studies Department. Sixty percent of this six-credit course requires each student to produce and publish a variety of new

media that are based on the concept of pushing their knowledge out to a broader "niche" audience online. The remaining 40 percent of this course includes readings and discussions focused on critical commentary concerning how participatory-media technologies and practices are transforming the media landscape. Some of the class discussions, for instance, are based on the latest literature on Web 2.0 and new online publishing models. There's also a continuous back and forth between students and the instructor related to the thinking and actual production of their projects.

Early assignments include creating and understanding blogs and podcasts. The blog cannot be a kind of lawless, live-journal conversation that is often typical of many of today's informal blogs. It has to be well written and within the boundaries of an academic discussion. The podcast has to be based on a critical issue related to today's participatory media. Students, for instance, are asked to interview a professional in the field and provide a critical analysis of a topic related to new media. They record the interview and basically write and edit a five-minute radio-like presentation and then upload the podcast to their blog.

Students in this Participatory Web class are also required to take part in a citizen journalism and reporting project, where they go outside the classroom and conduct interviews with people in their local community, take digital pictures, and then post a finished project to a website. Another assignment has students involved jointly in a video project where they go out into the community again and create an interesting story that ultimately gets filmed, edited and published online as a electronic media file that is des-

igned for a popular community-oriented, video blog.²³

Finally, students in this course also learn how to create and take advantage of RSS technology; plus everyone is required to have a Flickr online photo sharing account and take part in a variety of image-sharing activities.²⁴

A Problem-Based Approach for Learning to Be

In many ways the Participatory Media class brings together a problem-based learning (PBL) instructional approach that includes a student's personal development of modern information fluency skills. It is also a great example of "learning to be" as opposed to "learning about":

Lecturing can be a very effective way to communicate information about physics, for example, but bridging the gap between knowledge and knowing entails learning by doing and joining a community of practice. . . We need to find ways that allow students to learn more about learning to be. . . Today's students want to learn and create at the same time, and pull content into use immediately.²⁵

Building 21st Century Skills

The Participatory Media class is also a great example of how students can be taught how to think critically when conducting research, collaborate effectively on joint projects, and create and manage something that could have value in an online publishing and sharing environment - all 21st century skills that American businesses are demanding from its future Net Generation employees.

The need for project learning and management skills for high

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school and college graduates entering the work world is critical, yet it is a sorely missing component of the traditional K-12 and postsecondary school curriculum. The lingua franca in business - it's mostly projects. . . At the college level, students are acquiring great theoretical knowledge, but they're deficient when it comes to applying it - they're just not able to connect it to real life.²⁶

An article in *Time Magazine* also addressed the topic of how education needs to better prepare students for 21st century business. Under a sub headline, "Becoming smarter about new sources of information," it was noted that

In an age of overflowing information and proliferating media, kids needs to rapidly process what's coming at them and distinguish between what's reliable and what isn't.

The article then quotes a Dell executive as saying that "It's important that students know how to manage it, interpret it, validate it, and how to act on it."²⁷

On Being Resilient and Finding Balance

While the message in *Time Magazine* is well intentioned, teaching students such information fluency skills is indeed a challenging proposition. What's the solution?

Becoming truly information fluent in a constantly changing environment presents a need for educators and students to be resilient, not resistant, to the nuclear information explosion that continues to expand at unprecedented speeds. We live in turbu-

lent times in which success in business, for instance, relies on an ability to "dynamically reinvent business models and strategies as circumstances change." This is also referred to as "strategic resilience," whereby one has to have "the capacity to change before the case for change becomes desperately obvious."²⁸

In addition to being resilient, a sense of balance needs to be maintained in order to deal effectively, and sanely, with rapid, over-the-top kinds of changes that are happening today. This means being fully aware and making conscious choices, while not getting too distracted by the technological advancements swirling around higher education like moving targets. There are fundamental principles that remain the same, such as being able to think critically to solve problems and make intelligent choices based on sound, time-honored values and principles.

If today's students have an instinctive capacity to operate the devices and navigate the shoals of the networked world, to find easy answers with astonishing speed, to impress us with the dexterity of their shortest, thickest digits, they still require education in learning how to ask the difficult questions that most likely have no simple answers. That is what critical thinking requires, and that is the essence of true information technology.²⁹

Perhaps the final overall message educators and students need to realize is that technology cannot do our thinking for us, and part of making intelligent choices entails slowing down and taking a closer look at what's really important to us as individuals and as

institutions.

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Blackboard Social Bookmarking System Moves Beyond Traditional Web Searching

In a recent interview with Karen Gage, vice president for the Blackboard Beyond Initiative, *Educational Pathways* got a tour of Blackboard's newly launched "Scholar.com" social bookmarking system. All Blackboard clients, including WebCT users, can now freely integrate Scholar.com within their learning management system.

Scholar.com is the first "property" to launch within the Beyond Initiative, which, as noted in Blackboard literature, "is committed to the development of a series of web properties that connect the institutions, faculty and students who use Blackboard worldwide, across education segments and disciplines, leveraging the wisdom of the community for teaching and learning."

How It Works

Social bookmarking is simply a way to electronically save and share a collection of resources. To paraphrase a definition of social bookmarking from the EDUCAUSE Learning Initiative, it is the practice of saving bookmarks to a website and tagging them with keywords. In this case, the website is built into the Blackboard learning management system, and users create accounts where they are able to store, tag and share their bookmarks. In a course scenario, faculty could have administrative control over the display and sharing features in the course. For instance, faculty can allow students to contribute to a shared collection of course bookmarks or set up custom streams to pull anything tagged with search parameters of their choice (e.g. the most recent bookmarks tagged with "DNA" and discipline tagged with "Nursing" and saved by instructors).

Product Development Partners

In addition to talking with Gage, we spoke with two of the early adopters of Scholar.com, both from Grand Rapids Community College (GRCC): Eric J. Kunnen, coordinator of instructional technologies, and Garry Brand, faculty development coordinator and associate professor, Business Law. Kunnen and Brand were also active participants of a product development partners team that was comprised of about 15 Blackboard-client institutions and a team of Blackboard engineers that jointly brought this social bookmarking system to fruition.

People Everywhere Just Want to Share

Gage explained that the product development team "gave us feedback all along the way," during a six-month process that began last year. Additionally, prior to putting together the product development team, Blackboard conducted focus group sessions with some of their other clients to determine whether or not social bookmarking was actually the appropriate place to begin the Beyond Initiative. "It turned out to be a great place to start because people want to share resources," said Gage. "People typically share resources offline, or by sending links and e-mails to their colleagues or to people within their study groups. We found that a social bookmarking system would be a great place to start in terms of building knowledge-sharing environments for students and faculty."

Social Bookmarking Not So Popular, Yet

One of the interesting things that Kunnen found, through a

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survey he conducted at GRCC during the early development phase of Scholar.com, was that most students are not in the least bit versed in using social bookmarking tools. One thousand students were asked about what social bookmarking tool they use, if any. More than 890 students said none, 26 said they used del.icio.us, and the remaining said they used either FURL or SPURL. Kunnen said that another development partner from an institution in the United Kingdom conducted a similar survey and came up with similar results.

Brand, who has used Scholar.com in a Business Law class comprised of 30 students, explained that the vast majority in this particular class had not used a social bookmarking tool before. "They really did not know what social bookmarking meant until they got to use it in a group activity," he said. "Even those students who have used these kinds of tools have never used them in an academic setting. So, this is very new for most students, and they are just starting to see the power of using these tools."

Learning Through Sharing

For example, Brand explained how the Business Law students used Scholar.com to share their research about online credit reporting services by finding and tagging both phony and trustworthy websites that offer such services. In addition to this shared-learning experience, students exchanged law-related resources with other students from Georgetown University, where a stream of resources tagged under "law" was made available to the worldwide Blackboard community.

"This is just one example of the potential power there is around social networking and Web 2.0

technologies like social bookmarking," added Kunnen. "I think we are at the cusp of this, and it is not just an individual application. It is an opportunity to allow you to use it not only for your own work, and for classes, but also for other projects at your institution."

Saving Faculty Time

"There are a lot of social bookmarking sites out there," Kunnen continued. "One of the reasons why I think there is some power in the Scholar application is because it can be integrated with your course environment and the Blackboard system. So, you can be out on the web searching for something and then all of a sudden you come up with a nice resource that would be good for your class, and you just tag it right there, and it is dynamically updated within your course. It does not require any extra action. You just tag the resource and it is there for your students."

Other Potential Uses

Brand, for instance, has also incorporated Scholar.com into some professional development efforts related to GRCC's Academic Foundation Program, which is a set of classes that prepare students for college level work. "We quickly established an AFP team tag to share resources," Brand wrote in his personal blog. "We can now share resources with developmental education faculty at other institutions."

Additionally, Brand is starting to bring Scholar.com into GRCC's reaccreditation process, whereby resources related to GRCC's participation in the Higher Learning Commission's Academic Quality Improvement Program (AQIP) can be found, categorized, tagged and shared more easily within a single web-based environ-

ment. "I see a real need for knowledge management here on campus; institutions have a need to gather resources that everyone can look at in one spot," said Brand. "That is why I am exploring this, because I feel we can use Scholar as a tool to help populate a portal (or some other kind of website) where we can track and see what resources are available."

Overall

The whole idea of Scholar.com is to allow users to obtain information that goes beyond traditional web searching, said Gage. "We have gotten a really good response so far from clients who have seen it. There is a lot of excitement and a feeling that this is an interesting, newer kid of tool from Blackboard. They are enthusiastic about the way it has been integrated with their core platform on campus for teaching and learning."

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