

From Broker to Strategist: Notes of a Traveler in the Strange Land of Information 2.0

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Suitably Lengthy Preamble

I suppose I've always been interested in books and libraries. As a child, I remember going every Saturday to my local public library in Kelowna, BC, and taking out four novels. By Saturday evening, generally three of them were read. This, of course, made me a very strange kid, but I found great pleasure in getting lost in other worlds.

In high school I hung out in the library a lot. In graduate school, I did volunteer work in the library. When I taught in Africa for two years, I declared myself the default librarian of the college in which I was teaching, developing a problem with book mold in my lungs that eventually had me shipped home.

I became a professional librarian almost by accident. When I got back from Africa, I taught in a theological school for a year and a half. As that term appointment was ending, the librarian position opened up. I worked out a deal to pursue a Master of Library Science degree while running the library part time, with the plan that I would move to full time when I finished my degree. While that institution became part of a university-based consortium, I've had essentially the same career in the same place for the past 26 years.

All this to say that I came naturally to libraries and information systems. I've always been comfortable in such settings, and I had an instinctive appreciation for the best ways to optimize the tools of research. That's why one of the biggest epiphanies in my life had such an effect on me.

I had just finished my library science degree and was doing what librarians do – helping students (undergraduate and graduate) with their library use - when one day it just struck me: These students don't know how to do research. This wasn't a "these students don't know how to do research so we better put on a workshop for them" kind of epiphany. It was a "these students, both undergraduate and graduate, don't have the foggiest idea what they're doing, and it looks to me like getting them up to scratch is going to be a whole lot of work."

I didn't know it at the time, but that was the start of a personal crusade that has involved a good deal of my time ever since. Along the way, I've discovered a number of things, including several sweeping but ultimately valid generalizations:

1. Most students have minimal genuine academic research skills.

2. Most students do not develop significantly better research skills by practicing research (the learning by osmosis theory).
3. Most faculty are locked into the pessimistic view that student research, while dismal, is the best we can expect.
4. Most faculty believe poor performance in student research is a factor of poor motivation, poor time management and laziness.
5. Few faculty believe it is possible to train students to become significantly better researchers. Their skills will only improve if they are motivated and actually practice research with real projects.
6. Most students believe they have adequate to good academic research skills, though any test of those skills will show that they do not.
7. Most students have no concept of what better research skills would look like and are resistant to further training.
8. Even if it were possible to advance student research skills, most faculty do not have the time within their courses to allow for research training beyond an hour or so per semester.
9. Even if it were possible to advance student research skills, most faculty do not believe that such an enterprise is important enough to pursue vigorously.
10. The lack of information handling ability among university students is the biggest blind spot in higher education today.

And so I naively began trying to do something about all this. The information age was already well on its way, though I didn't fully appreciate it at the time, and I had this sense that the ability to handle information was a significant educational attribute that all our graduates should have.

I didn't recognize at the time that someone else had beaten me by a good ten years. Paul G. Zurkowski, founder and first president of the Information Industry Association, had put together a short paper in 1974 entitled, "The Information Service Environment Relationships and Priorities." It can still be found full text in the ERIC database. In it, he coined a new term – "information literacy" – by which he meant skill in handling information. Zurkowski is not a librarian. In fact, he's a lawyer and, more recently, a real estate agent and entrepreneur. But his vision of an information age in which, by his estimation, only about 20% of the US population was information literate, was haunting. Zurkowski called for a massive nation-wide campaign to get the rest of the populace up to speed, a campaign that, for a variety of reasons, never caught on with the American public.

He wrote:

Information is not knowledge; it is concepts or ideas which enter a person's field of perception, are evaluated and assimilated reinforcing or changing the individual's concept of reality and/or ability to act. As beauty is in the eye of the beholder, so information is in the mind of the user.

We experience an overabundance of information whenever available information exceeds our capacity to evaluate it. This is a universal condition today for three reasons:

- (1) The information seeking procedures of individuals are different at different times for different purposes.
- (2) A multiplicity of access routes and sources have arisen in response to this kaleidoscopic approach people take to fulfilling their information needs. These are poorly understood and vastly underutilized.
- (3) More and more of the events and artifacts of human existence are being dealt with in information equivalents, requiring retraining of the whole population. The infrastructure supporting our information service environment transcends traditional libraries, publishers and schools. It embraces the totality of explicit physical means, formal and informal, for communicating concepts and ideas (Zurkowski, 1974, p.1)

In these words I think we have the essence of a prophetic message to our day, a kind of clarion call to the age of technological information in which we find ourselves. Indulge me a moment while I share a bit more of Zurkowski's 1974 vision:

He wrote:

People trained in the application of information resources to their work can be called information literates. They have learned the techniques and skills for utilizing the wide range of information tool as well as primary sources in molding information solutions to their problems.

The individuals in the remaining portion of the population, while literate in the sense that they can read and write, do not have a measure for the value of information, do not have an ability to mold information to their needs, and realistically must be considered to be information illiterates (p. 6).

Had I approached Paul Zurkowski in 1984, ten years later, and told him, "My students don't know how to do research," he would have answered, "I know." Having gotten to know Paul Zurkowski personally in the past year, I am pretty sure he would have also said, "What are you going to do about it?"

Well, I was determined to do something about it, but, unlike Zurkowski, I thought it was a relatively simple task. He knew better. So I planned my strategy. I had a sympathetic

academic dean who was open to all kinds of ideas. I recited my mantra to him, “Our students don’t know how to do research.”

“I know,” he said sadly.

“I could teach them,” I offered.

“How?” he asked.

“How about a one credit course,” I said. “We could require it as a prerequisite and make sure no one graduated with inferior skills.”

To this day, I’m not sure why he bought it, but he did. I created undergraduate and graduate one credit courses that every student was expected to take in their first year of study. It was far too easy a process, and I should have understood that I was experiencing a miracle, a parting of the academic Red Sea. But I was young, naïve, and I didn’t realize what I had been given.

That’s not to say I didn’t take the task seriously. I used ERIC to study up on the handful of other such courses that had been written about. I even wrote my own rudimentary textbook because I couldn’t find what I wanted out there in pre-amazon world. It was published by a division of HarperCollins in 1990 and I rewrote it as a self-published work in 2000, doing a second and third edition in 2004 and 2008. Sales are not bad.

While the undergraduate division folded, my one-credit course is still very much in operation at the graduate level in our seminary consortium. It’s required of all students and, since early 2000 has had an online version as well.

Lessons Learned – From Broker to Strategist

What have I learned about the problem that our students don’t know how to do research? Let me break it down into three components: First, that I was right and I’m still right (so was Zurkowski), second, that the information literacy gap is the biggest blind spot in higher education today, third, that there is an approach to this problem that can hopefully one day fulfill Zukowski’s vision of an information literate population.

1. Our students, indeed, do not know how to do research.

When I realized that I was right about this, I stopped being a mere information broker (guiding researchers to the information they needed) and became an information navigator, a guide to the research process. But learning just how bad things actually are took some time.

Where do I begin? Telling you all about this in great detail would make my head hurt. I could throw a ton of data at you, but that would probably make your heads hurt too. I

could simply ask you to believe me, but I want to know that understand the extent of this problem, because it's amazing.

Let me start with a few stories:

A. I got an e-mail from a desperate graduate student at a major American university. Her plight didn't surprise me. She wrote:

I spend hours searching when I could be reading or analyzing or writing...I'm still trying to resolve this issue – (I'm too ashamed to tell my professor at _____) -- here I'm in a LIS beginning course training for some aspect of librarianship -- and don't know how to use the searches efficiently! The tutorials are there on the website, but they are not user-friendly.

This was a graduate student working on her *Masters Degree in Library and Information Studies*, yet she was struggling with common electronic research databases.

B. Another graduate student e-mailed me for some advice on a research project and later responded: "Thank you for your encouraging words on research being available online! [*She was talking about subscription journal databases, so I'm not sure if she was truly clued in.*] I feel like I will be able to accomplish my research paper on servant leadership. It has been frustrating having little or no guidance over the years."

C. I got a telephone call from a 52 year old woman finishing a bachelor's degree in a night program at an unspecified institution. She was taking a course for which the professor had asked the class to write an interdisciplinary research paper. In her estimation, while the professor had provided her with some rather broad examples of what could be done in such an assignment, he had made no real attempt to explain how actually to do it. Nor did she have any confidence that even he knew what the process might be, let alone how to explain it to the class. Her research skills were minimal, but no one at her institution had offered her any real help. Instead, when she wasn't phoning me for advice, she was reading and marking up a copy of my textbook, *Research Strategies: Finding your Way through the Information Fog*.

As a reference librarian, I observe, pretty much on a daily basis, students who don't know the difference between a peer reviewed journal article and a website, who have no idea how to determine the best places to look for information, and who lack the skills to evaluate the information they do find. While they have access to wonderfully sophisticated research databases, they treat them like Google, if they use them at all. In fact, when you discuss with them how they use Google itself, they admit to frustration, having little understanding of how best to formulate even simple searches in this ubiquitous search engine.

Today's university students have no clear grasp of the world of information itself – where it comes from, under what conditions it is published, what types of information exist, what tools are available to help them discover it, how to use those tools, how to critically discern what is accurate/useful information, and how to apply information to the research

task at hand. Students are swimming in a sea of information, but they have little grasp of how to harness it and use it well.

Okay, let me throw a bit of data at you, not much, but hopefully enough to be convincing.

a. Incoming Freshmen

One of the largest studies of incoming university students (thus recent high school graduates for the most part) was done in Quebec, Canada (Mittermeyer and Quirion 2003). It surveyed just over 3000 students, finding that less than 36% of them understood such research foundations as the characteristics of scholarly journals, the difference between library catalogs and bibliographic databases, search terminology constructions that would eliminate non-essential words, the use of controlled vocabularies in databases, identification of a journal citation, and issues regarding the ethical use of Internet information. The researchers concluded that “a significant number of students have a limited knowledge, or no knowledge, of basic elements characterizing the information research process.”

Several other studies have found the same. Kennedy et al. (2006) surveyed more than 2000 incoming Australian university students who demonstrated that, while they were highly tech-savvy in using a core of tool types (computers, cell phones, e-mail), their knowledge of, and facility with, academic tools for research was limited. The researchers commented: “Moreover, it is recognized that core technology based skills do not necessarily translate into sophisticated skills with other technologies or general information literacy.”

The *First Year Information Literacy in the Liberal Arts Assessment* (2008), studying students in several American and Canadian institutions, found for 2006 and 2007 that incoming university students had weak understanding of many foundational information handling and research skills. For example, less than half of new students understood the function of a Boolean “or” search, and most could not identify a citation to a journal article or a portion of a book. Only about half had used library catalogs and less than a quarter had used journal databases (though almost everyone used search engines).

b. Senior Undergraduates

Maughan (2001) presented surveys administered to senior undergraduates at the University of California-Berkeley in 1994, 1995, and 1999 which showed that students consistently over-estimated their research ability, while, of eight discipline-specific groups of students studied, five showed failing scores even on measures of lower order information literacy. His study concluded that “students think they know more about accessing information and conducting library research than they are able to demonstrate when put to the test” (p.83).

Kuh and Gonyea (2003) studied data gathered from over 300,000 participants in the College Student Experiences Questionnaire, 1984-2002. While more students were using databases in the later years, almost 20% of senior students indicated that they never make judgments about the quality of information they acquire for academic work. The researchers concluded: "This is an unacceptably high number of students about to graduate from college who, by their own report, are underprepared to live and work in an information-rich world" (p.266).

Alison Head's (2007) research may be a bit more encouraging in that her study of upper level undergraduate students found them diminishing their use of Google as a first choice when starting research, in preference to course readings and even library resources. But the results of her study are telling nevertheless as she argues that: "Most students were confused by what college-level research entails." About 60% of her subjects struggled with narrowing topics and making them manageable, while the same percentage admitted being overwhelmed by the number of resources available to them. Interestingly, the greatest frustration was reserved for the perceived lack of guidance from professors regarding the conduct of quality research (supported by an actual lack of helpful instruction in assignment handouts studied).

c. Graduate Students

The really discouraging element in all of this is that students do not appear to learn how to do research by doing it. Even graduate students struggle with information use and do badly at it. The telling study by Randall, Smith, Clark and Foster (2008) demonstrates haphazard, confused and inconsistent research methods among students doing doctoral research across a number of disciplines. Other than the mining of existing bibliographies, it appears that none of those studied had any sophisticated skills in locating information. Few of them were using bibliographic managers to organize their resources, and there seemed to be general air of trial and error in all of their research methods.

Gallacher (2007) reported widespread inadequacies of research ability in studies of incoming law students in seven institutions and saw little evidence that the research training available to law students was succeeding. His conclusion:

"Taken together, the studies present a potentially discouraging picture: while incoming law students are clearly intelligent and capable, and have excelled academically at every previous stage of their education, the available data suggest that many incoming students have information literacy deficits that will affect them through their career in law school and on into the practice of law, and that they are unaware that such deficits exist." (p.32)

Lippincott and Kuchida (2005) discovered that MBA graduates continued to struggle with information needs in the business world. "Of concern was the lack of differentiation between information skills and technological abilities and the lack of understanding of the complex nature of information used to make important business decisions."

d. The Workplace

All of this, of course, has ramifications for the workplace. Alarming, the growing evidence demonstrates that those same students who never learned how to do research well are indeed bringing harm to their workplaces, where inability to handle information competently is rampant.

IDC, a significant market intelligence organization, in 2005 surveyed 600 industries in four sectors – financial services, government, manufacturing, and healthcare – to determine their costs for handling information. The resulting white paper presented some startling statistics. For the average worker, the discovery and analysis of information now consumes 24% of working hours and costs each organization \$14,000 per worker per year. What is more, not finding needed information or having to retool or reformat existing information costs the average 1,000 employee organization over \$10,000,000 per year. The paper concludes: “In this and other IDC studies, it has become obvious that tasks related to creating, organizing, finding, and analyzing information have become significant time sinks. The problem will only get worse as our economy migrates from being manufacturing-based to information-based” (Feldman and Duhi, 2005, p.8).

Susan Feldman, one of the authors of the IDC White Paper, has compared that study with others that show similar patterns in workplaces around the world. Overall, knowledge workers search for information 15%-35% of their workdays and find what they seek only 50% of the time. (Feldman, 2004)

Let’s end this depressing litany of problems with a quote from management Guru, Peter Drucker. In a 1992 interview, he said:

In today’s organization, you have to take responsibility for information because it is your main tool. But most don’t know how to use it. Few are information literate. They can play ‘Mary Had a Little Lamb’ but not Beethoven. (Harris, 1993, p. 120)

2. The Biggest Blind Spot in Academia Today

My success at getting an information literacy/research course into an institution as a required component of the curriculum was a fluke. The reality is much more tragic. While there is now an enormous literature in the field of information literacy – the ability to pose a problem, acquire relevant high-quality information to address that problem, evaluate that information and apply that information to the problem – this literature is virtually unknown in higher education. While librarians see a huge problem with student inability to handle information competently, most information literacy librarians have been relegated to the sidelines where they do one-shot instruction sessions that don’t even begin to address the problem.

This has created the biggest blind spot in higher education today – the inability of most academics to see that our students do not know how to handle information, are not learning how to handle information, and are entering the workplace and the information age without the skills to deal with the main tool of modern life – information. The problem, of course, is massively compounded by Information 2.0 – the digitization of

virtually everything and the massive expansion of information availability due to the WWW. The real question to ask is, “Why is it such a blind spot?” I have several possible answers, though I have to admit that it continues to baffle me.

a. The Understanding Gap

Though we are dealing with a complex and challenging set of understandings and skills that require much instruction and practice to develop to the point of sophistication, the response of academia to this point has been to make it a remedial issue. This indicates a misunderstanding of the nature of the challenge and, indeed, of the nature of information literacy itself.

Even librarians, who are well familiar with the problem, have been slow to acknowledge the full orb of information literacy. We have been so used to teaching people how to use libraries (thus calling information literacy “library instruction,”) that we have failed to grasp that library instruction *per se* is not the point.

Information literacy is about *understanding information and how it works*. It’s about introducing students to the forms of information available to them (wherever the information actually is), then helping them determine what sort of information they need, how to find it, how to evaluate it, and how to use it effectively and ethically. To equate this with teaching students how to use a library is as ridiculous as assuming that driving a car simply requires that a person needs to know how to step on the gas pedal. There is, as they say, “so much more.”

To assume that we can meet all information literacy needs with a library tour or an hour of instruction is to misunderstand utterly what those needs are. Information literacy is not a remedial topic but a whole way of thinking about information and its use. To miss this point is to relegate information literacy instruction to a back burner.

The reality, however, is that genuine information literacy is developed within students the way that many other knowledge-based skills develop – from a combination of instruction and practice over a significant period of time. Information literacy is a challenging discipline involving effort closer to learning a new language than to learning how to read a spreadsheet.

Thus a crucial reason why information literacy does not have a significant place in academia is the fact that it is misunderstood and underestimated. If there are few opportunities to watch students become information literate, academics will assume that it can’t be done, that students just don’t do research well and can’t be taught how to handle information skillfully. And, since they graduate anyway, even without sophisticated information skills, we assume that somehow our students have turned out all right anyway. But they haven’t.

b. The University Administration Gap

Webber and Johnson (2006) in a British study of key stakeholders within universities, found minimal understanding of information literacy among academic administrators. While there was some discussion about information skills, administrators confused information literacy with computer literacy. Information literacy did not appear as such in university documents, and it found no place in marketing the university. When dealing with the library, administrators were more interested in holdings and in quantification of transactions (how many books were borrowed, etc.) than education of users. No administrative committee in the Webber and Johnson study believed that its mandate included fostering information literacy.

The same is true for many, if not most, universities in North America.

c. The Perpetuated Experience (Osmosis) Gap

Many faculty have either forgotten their own process of information literacy development (Leckie, 1996, p. 202-203) or remember it rather triumphantly, because they were always smarter and better at research than most of their fellow students. Either way, almost all faculty members learned their research methods by trial and error.

If I may speak from about 25 years of personal experience, a large number of graduate students, even of doctoral students I have known, continue to struggle to pick up skills necessary for their thesis and dissertation research, the keener of them often depending heavily on librarians. To be even more brutally honest, many of these students have an uncanny ability to optimize highly inefficient research methods and somehow pull together a decent dissertation by sheer brilliance alone despite shabby skills. These students then take up professorial roles, never having learned how to navigate a journal database with skill, use controlled vocabularies to advantage, or even take on advanced features in a library catalog.

To get where they are, faculty often have flown by the seat of their pants, on their own, with minimal guidance. They somehow made it through, and learning research by doing research is the only training method they know. Is it, in fact, possible to teach people how to develop research skills? It is, but most faculty have never actually seen it done and are not especially interested in attempting it themselves.

Leckie (1996) discusses an “expert researcher” model inhabited by faculty members. Professional academics work within narrow fields where they have a strong understanding of their literature. For many of them, keeping up with a few journals and staying in contact with colleagues is more useful than doing the kinds of research performed by their students, who know little about the field they are studying and thus must cast a wider net to find relevant material for research projects. Leckie concludes, “The expert researcher simply cannot imagine (or refuses to think about) the continuum of problems that undergraduates have in using even a moderately-sized academic library” (p. 206).

Leckie and Fullerton (1999a) found that faculty generally think students' research abilities improve over time. They wrote:

As to how this improvement happens, interviews with faculty revealed that a very large number of faculty admit they have a poor understanding of how students learn to do library-based research. The most common thinking was that students somehow learned to do this on their own, by visiting libraries and using the resources available, or that they were approaching librarians, who then showed them the intricacies...Related to this, another common faculty perception was that students who had not learned to do library-based research by their upper years were unmotivated, uninterested, or just poor students (p. 13-14).

Leckie and Fullerton commented further: "Unfortunately, these views tend to perpetuate the type of individualistic trial-and-error learning environment that many faculty themselves experienced in graduate school but that does not develop the information literacy skills the majority of undergraduates today will need to be productive members of society" (p. 14-15).

d. Faulty Assumptions about Students and Technology

The myth that technological ability equals information and research ability seems to have convinced the best minds in educational thinking today. We hear it everywhere today – let's get computers into the hands of our kids. Let's cross the digital divide. But the real problem is not technological literacy; it's knowing how to handle the data in our world. Faculty who assume that students are pretty good with all the new tools and gadgets available to them and thus just need to be set loose on the world are missing the point – There is little to no connection in the research between a keen user of technology and a skilled user of information.

e. Faculty culture

There is a tendency among many faculty to view the lack of information handling ability in students as a motivation issue. If students really cared about their academic work, they would apply themselves to the research task much more skillfully. But the problem of shoddy research is more than just a motivational one.

The value of Larry Hardesty's (1995) study of faculty culture ("Faculty culture and bibliographic instruction: An exploratory analysis") to this issue can scarcely be overestimated. Hardesty demonstrated that at the heart of librarian-faculty misunderstanding (and thus struggles with getting information literacy on the academic agenda) is the interplay of two distinct cultures. Whereas librarians typify a "managerial culture" of goals, collegiality and a concern for the broader educational requirements of the student, faculty culture emphasizes "research, content and specialization," with a "de-emphasis on teaching, process and undergraduates." A supreme value among faculty is professional autonomy, whose corollary is academic freedom. Faculty, as well, according to Hardesty, typically face a chronic shortage of time to fulfill their tasks and are resistant to change. Librarians, seeking to meet broad student informational needs and develop skills that go

beyond the bounds of any particular subject discipline, are thus viewed by faculty as intruders.

What is more, faculty as skilled users of information within their disciplines often do not have a teachable method to offer. Their methods are cyclical and eclectic, not linear and step by step. You can afford to be cyclical if method for your discipline is so ingrained in your psyche that you can start anywhere and know where you are and where you're going. But our students lack expertise that can substitute for method. Many faculty members have failed to grasp the challenges students face in navigating through an unfamiliar topic.

Addressing the Problem

1. Models of Information Literacy and their Problems

If this building were burning down and I ran through it shouting, "Fire! Fire!," no doubt people would take notice. Some might think I was some sort of loony, but they would at least check it out and, having smelled the smoke, get out. For the past 20+ years I have felt like someone shouting, "Fire!" Only, in my case, the response has often been, "If there is a fire, it's only a small one and we faculty can put it out ourselves."

Information literacy is viewed by most faculty as a remedial issue, curable through short-term instruction followed by lots of practice by students. No matter how loud I shout, I can't convince a lot of people that we have a major problem on our hands – We are graduating students who have minimal information handling skills, who are playing "Mary had a little lamb," in a workplace that demands Beethoven.

Let's think of models of information literacy instruction today. By far the most common is the one-shot, either as a generic library orientation or, less commonly, a subject specific orientation in a regular classroom preparing for a major student assignment. The one-shot model assumes that information literacy is a remedial problem, curable by a short-term remedial model of instruction. The amount of actual progress in information literacy generated by one-shots, however, is minimal.

I have long advocated for a full three credit course as part of the core of each major. Such a course would work with the subject matter and overall methodology of the major, teaching students how to handle information within the subject area that is getting the most of their attention. The biggest challenge here is fitting it into the curriculum, especially when its importance is considered doubtful by faculty. In my own institution, we have a three credit research and writing course in the core of our undergraduate communications major and a one credit graduate research course required of all students in one of our grad programs. Both are required. Yet, it's not much to show for all the years I've spent at this.

Another model that shows promise is a through-the-curriculum approach that involves faculty recognizing that information literacy is indeed a long-term training task and

plugging information modules and requirements into a variety of courses. This method, which it does succeed much more than the one-shot, requires sustained energy to keep faculty motivated and to manage student experiences so that they get all their required information literacy.

The one big problem with all of the above is that information literacy is an intrusion into regular instruction, like your country cousin coming to visit you and staying for a year or two. Faculty tend to think of librarians, who do most information literacy instruction, as lesser academics, and many professors remain unconvinced that the class time given up is worth whatever gains in information literacy are produced.

2. Challenges of the Electronic Information Age

That is why, lately, I've been thinking that we're going about this all wrong. This hasn't been easy for me to admit, and I'm still working through the ramifications of it, but I think I'm starting to see daylight. Let me begin with where I think education is going.

Since the creation of the Worldwide Web (WWW) in 1989, a revolution in the world of information, unprecedented in human history, has overtaken academic life. The information technology revolution has led to several rather astounding challenges:

a. Academics have an impressive array of new tools available to them, from PowerPoint, to Video, to Internet feeds, to online instructional tools, to complex information databases, to collaboration tools (blogs, wikis), to mobile delivery of education via podcasts, messaging and so on.

b. The very nature of what we call "information" has changed, as has its subset, "academic information." Prior to the WWW, most publishing was done through a process of gatekeeping. That is, manuscripts were vetted by experts for quality and marketability before being allowed into the publication stream. Many proffered manuscripts were thus never published. While gatekeeping continues, the WWW has opened the opportunity for anyone to publish without any form of gatekeeping at all. What is more, such publication is virtually free to both producer and user, and our common search engines have no way of distinguishing between a reasoned piece of high quality academic writing and trash. When Wikipedia and Google become the primary sources for university student information, with libraries and academic databases becoming third and fourth choices, the task of gatekeeping falls on the students, who often do not know they have been given such a task and who lack the skills to evaluate the information they are encountering

c. The world of information itself has become exceedingly complex. For the average scholar (professor or student), beyond the traditional books and journals are e-books, e-journals, academic websites, open-access self-publishing venues (e.g. Scribd), open-access journals, academic blogs, pre-review academic articles, podcasts, videos and so on. Collaborative academic wikis publish works in progress, with the full intention that they will be revised over time by a whole team of scholars. It is thus becoming

increasingly easy to miss cutting edge information, especially if scholars searching for it in the new environment keep their scope of exploration narrow.

d. The tools for information acquisition are complex. Journal databases require significant training to maximize, and even seemingly simple tools like Google Scholar are almost prohibitively challenging when trying to make sense of search results.

e. Information has become cheap. These days, to see a professor standing at the front of a classroom, PowerPoint loaded and lecture ready to be delivered, is, for most students, an anachronism. Why would students want to take an hour to hear a professor provide an information dump that the average person could have acquired from Wikipedia in half the time? Why value the conveying of information from one brain to another, when mere information is so plentiful and so cheap?

3. The new information era professor

When we consider the model of professor that is emerging, it is very clear that he/she will not be a mere conveyer of data. The lecture is dying in importance to our students, who have grown up in a world where information is acquired in context, hands-on. The expertise of the professor will be less as a talking knowledge base than as a professional methodologist.

The new information era professor is going to be someone who is keenly aware of the tools and resources of his/her discipline, has a strong disciplinary sense of methodology, and guides students as they acquire knowledge and skills through largely self-directed learning. What sort of guidance is required? It's the kind that separates wheat from chaff, enables students to develop the skills of critical evaluation and use of evidence, and provides a critique of student work that will help students become skilled disciplinary navigators. To be sure, there is knowledge that needs to be absorbed, but other means than valuable classroom time can be devoted to that task. The classroom or online environment needs to become the place where students learn how to "do" their subjects, navigating through the sea of information, most of it digital, while learning how to solve problems and address issues. The result will be graduates who know what they are doing, despite the complexities of the demands placed upon them by the workplaces in which they find themselves.

The new information era student will have a high expectancy of becoming deeply involved in the educational process, doing a good deal of research personally, using a wide range of complex technological tools, interacting with the professor about key issues and skill-sets, and receiving significant critique of work done, along with an opportunity to revise it. The image of the passively absorbing student will be replaced by that of the student actively seeking, evaluating and making good use of information under the guidance of a skilled disciplinary expert, the professor.

Toward a New Strategy

1. Metanarrative

This is where I have to introduce a difficult and perhaps controversial term, “metanarrative.” A metanarrative is an overarching explanation of why things are done the way they are. For example, I have devoted a lot of the past 20+ years to information literacy instruction. Why? Because my metanarrative says that information handling ability is a key attribute of today’s educated student, maybe the key attribute. I am guided in what I do by the metanarrative that provides the reason for what I do.

In the same way, every subject discipline has a metanarrative or several of them. The metanarrative determines:

- Why this discipline exists
- Where its knowledge base comes from
- What must be included in the knowledge base
- Why the academic discourse is carried out as it is in this discipline
- Why this discipline argues and uses evidence as it does, including a strong sense of what constitutes good evidence and what does not
- Why this discipline favors certain scholars as its major players – the movers and shakers that carry it forward.

2. Method

If metanarrative is the why, method is the how. I don’t think a lot of academics do much reflection on method, because it is so intuitive to them. But the question of how one gets from problem to solution through a maze of competing voices and evidence is a crucial one to students, who have not had the time to make the process intuitive. Here are some method issues:

- How one formulates a viable research question or thesis
- How one determines what sorts of data will be required to address the question or thesis
- How one best acquires the data, often using tools that are electronic and thus complex
- How one organizes the evidence to make it useful in addressing the central issue.

You may see that the why and the how overlap considerably. To know why a discipline works as it does strongly informs how it does its research. There is also a distinction in that simply knowing why a discipline functions the way it does is no guarantee that method will be carried out with skill (e.g. an understanding of the whys is no guarantee that a student can use a particular database with skill).

3. My Grand Idea

We live in an era in which information is a cheap commodity, and simply disseminating it is becoming less and less of an academic value in the classroom. The real value of today's professor is his/her expertise in handling the whys and hows of the discipline. Thus the focus is moving from the data to the metanarrative and method, from what we need to know to how we work with what we know.

You see it in many forms today – constructivism in education, deep learning, self-directed learning, active learning, 21st Century Skills. A growing consensus today is that, while it is still important to know things, the educated person of the future needs critical thinking, ability to work with the data in problem solving, and adaptability to new situations. This is the territory of metanarrative and method – the area of hows and whys more than whats.

What does a professor have to offer in today's information-saturated world? The ability to guide students in the navigation of the subject matter, in the problem-solving and critical thinking skills that make the discipline works. *The professor is not an information dispensing machine but a skilled navigator of a complex landscape.* This is the territory of information literacy. Librarians have carried much of this role for some time now, being less information brokers (who provide the right information for the task) than navigators who help students find the relevant information they need for their research, who help students, in fact, figure out the information landscape in which they have to work. Now that task is falling to professors. It has to, or they will become anachronisms.

What better opportunity do we have to get information literacy on the university agenda? If students, indeed, are going to be active learners, with their professors providing the expertise of methodology rather than the dump of content, students are going to have to know how to work with information effectively.

This is where I, as an information literacy specialist (and librarian), move into a new role – strategist. You see, librarians, as information specialists, now hold the keys to the information kingdom. While we may not have the metanarrative expertise of the professor, that professor does not understand the new electronic information world and its tools nearly as well as do the information specialists.

What is the strategy I propose? – I foresee a new world of collaboration that has nothing to do with librarians intruding into faculty turf and everything with librarians, as information specialists, working alongside faculty to make the new learning work. *In such an environment, information literacy is seen as the foundation of learning rather than an adjunct to it.* Faculty and librarians can team teach portions of the curriculum and co-create meaningful assignments, while librarians are keeping faculty up to date and generally monitoring and assessing the information literacy of students, even as faculty are leading them into the wonderful metanarrative of the disciplines in which they teach. This is already happening in some quarters but needs to become the norm. Information literacy needs to be foundational and integral to today's education.

I sense a great uneasiness in higher education today. Old ways, which have persisted since the renaissance, no longer work well. Our students are lost in Google and Wikipedia, and we are hard-pressed to get them back to our books and journals that seem so archaic to them. Lectures no longer do the job and everywhere there's a call for new methods that focus on learning. The research is unanimous in saying that active learning works better than passive learning.

The primary and foundational key to active learning is the ability to handle the information base well. While professors are very able in being able to draw students into the metanarrative of disciplines, the skills of identifying problems to solve, effectively and efficiently finding the best and most relevant information, evaluating that information and applying it well to the problem at hand, are skills requiring information specialists. Information specialists understand the whole sweep of the information world, both traditional and non-traditional, the complex tools of today's information acquisition, and the information handling skills required in today's information age.

In a time in which we are losing our knowledge base to an amorphous concept of "content," much of it not peer reviewed, making the foundation of our education the task of helping students understand and use the knowledge base of our discipline effectively is central to the survival of higher education. This is where librarians really do hold the key. We already have to tools to work with faculty to make information handling skill foundational to higher education.

4. My (admittedly) Fledgling Strategy

a. Fly the flag of information literacy, not as a librarian thing but as a *foundational* element of modern education. Help faculty and academic administrators to understand that a student's ability to handle information in order to solve problems is neither remedial (in that we can get everyone up to speed with minimal effort) nor foreign from the central educational task of developing critical thinking and the ability to *do* the discipline rather than simply parrot some facts. It is absolutely foundational. I don't think we've done nearly enough to show how important this is, otherwise we wouldn't still have this enormous blind spot around the fact that our students don't know how to do research.

b. Get involved in every teaching and learning initiative on campus that you can. Support the movements toward active learning. Get academic administrators interested in the possibilities afforded by an approach that makes professors guides and has students working actively within the disciplinary content in order to acquire its metanarrative for themselves.

c. Work with any professor who will see that you are not an intruder but actually on the same page. Professors are uneasy with the trends in the information world, generally unable to keep up with our rapidly changing information environment. To know that they can work side by side with those who devote their lives to keeping up and

who know how to teach information handling should become a relief rather than being seen as an intrusion.

d. Ride the new academic wave that is taking us from content dissemination to guidance in method and metanarrative. This is the best opportunity I have yet seen for information literacy finally to achieve a foundational role in education. Many studies have long shown that the average faculty member is so comfortable within his/her discipline that he/she does not pay much attention to research methodology. This does not help the average student who lacks both the knowledge base and disciplinary expertise to play in your pond. This is where librarians can work with faculty members to strategize training that is foundational to student learning and makes students into semi-expert researchers themselves.

I'm not backing down. It's time to be a strategist and finally get the task done.

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