
TEACHING THE TRUE FOUNDATION OF INFORMATION LITERACY: KNOWLEDGE IN THE INFORMATION SOCIETY

Barbara MacAdam

Introduction

Good morning! All good stories have a real beginning and so I want to begin by sharing with you a path that started well over a decade ago for me. I was invited by the College of Literature, Science, and Arts Honors Program and the School of Information to teach a course, one of the sophomore seminars in the honors program. The sophomore-level seminars are small, can be on any subject of the teacher's choice, and are intended to let students engage with ideas, think, analyze, discuss, and write substantively. Ideally, the seminar should prepare the students, no matter what the focus, for what lies ahead for them, especially since so many go on to graduate schools. From the point of view of the School of Information--the general expectation seemed to be that this would somehow be semester-long bibliographic instruction and about libraries and research. But from the Honor's Program point of view, they were not interested in "how to." As the director said to me, "Why do librarians always want to teach "how to?!" They wanted the course to be about ideas. As good a paraphrase as any, I suppose, for "knowledge discovery." And the details were up to me.

So I began to think, not about how to search for information, or use any specific information resources or technology, or even how to go about shaping a

research question or analyzing information. I began to think about ideas, more specifically the issues and aspects of what we then called the information age, about knowledge itself, and what living in a knowledge-based society might mean. Armed only with a set of interesting ideas, and the challenge of putting them together in a structured way to help a group of gifted young undergraduates think and learn, I put together a course called "The Structure of Inquiry." An appalling name as my new students told me, quickly replaced by "Knowledge and Society in the Information Age" the next year.

Two months into the course, I wrote to someone at the Kellogg Foundation "Here is the course syllabus. I wish it 'felt' as organized as it looks on paper! The first time through a course like this it seems that the most important things you learn are what to do better the next time..." The next year, I wrote to a famous colleague: "Here is the syllabus for the class I am teaching this semester. I wish it 'felt' as organized as it looks on paper! The students are very bright and I am working at trying to create a coherent structure for all the content. I will let you know how it went after the semester is over." Yet again the third year, I sent the syllabus to the president of the University who had expressed interest, and of course my email concluded "I wish it 'felt' as organized as it looks on paper." This question was easily answered by one of my student's evaluation that said: "I really enjoyed this class and Professor MacAdam is an excellent teacher. We had the best discussions of any class I have had and I learned a lot of insights. When

MacAdam, The University of Michigan, Ann Arbor, MI.

I started this class I didn't have the foggiest idea what it was about. I still don't."

Yes, true knowledge discovery is messy! So I stand before you today, bloody but unbowed. I believed then and I still believe that, in one way or another, too much emphasis on process and "how to" can actually take us away from the goal of information literacy. That too often the strategies we use, and what we teach, and the rules we try to set down or more gently lure our students to follow (in ways clever and amusing and engaging to our way of thinking) have the risk of sapping the very life blood out of an endeavor that is innately intriguing, intrinsically personal, and when done best, flouts as many conventions as it follows. We also find ourselves as professionals and teachers intensely, vocally ambivalent about the technology-fostered behavioral changes that we see among our community. The consequence is that it is very difficult to distinguish whether a principle or process that may have served us well in the past is an artifact to jettison, or a touchstone to reinforce. So sometimes our quest to guide our students to knowledge, and the wisdom to seek and find it themselves, can feel, if we're being very objective and very honest, more like a forced family road trip. You know the kind: leave before dawn, no stopping, no candy, no fighting in the back seat. And that just might be draining some of the life-blood out of us.

So for just a little while, let's try to step back from these immediate issues, because we will come back to them, I promise, and recapture or just nourish a little of our natural zest for knowledge work. Perhaps together we'll all come to share my belief that has not lessened, but only been reinforced over these many years now, that there is a set of concepts, so fundamental, so essential to an understanding of what knowledge is and how our modern lives are shaped by it that they serve as the foundation of anything we might call information literacy. Timeless and yet always in our time, they should stand up to the highest scrutiny if the bridges to information literacy rest upon them, and they should transcend any particular technology, or process, or information resources and we should find few boundaries they cannot cross. So over the next hour, explore with me a set of "first principles" or big ideas: concepts that undergraduates must somehow understand to join the ranks of the educated. And explore also with me how we can use them to engage faculty and teach students in ways that foster their understanding. Finally, I hope they will help us confront and challenge, as an instructional community, some fundamental assumptions that appear to guide the way we frame the needs of our

students and the strategies we have adopted with such vigor to meet those needs.

Big Idea Number 1 **The search for information and knowledge is personal and subjective.**

People will pose different questions about the same thing. People perceive events, observe, absorb and communicate information differently. Individuals vary greatly in the sources they use (deliberately or unconsciously) for information and place their trust differently. Over some months at my local video outlet, all my selections were closely scrutinized by young Mike, the video-store guy. "Awesome, excellent!" he'd pronounce on *Underworld*. "Very disappointing," he'd warn about *Van Helsing*. *Kill Bill I* rocked, and *Kill Bill II* was a major letdown according to Mike. And if in a weak moment I tried to slink up with *13 Going On 30*, I had to blame my husband's tastes to avoid letting Mike down. So my husband said, "Let me get this straight, our video viewing is being determined by ... Mike?!" "Pretty much." I replied. The point? We will effortlessly place trust, cheerfully confer "expert" in a specific context, based on instinct, or if the source has been reliable in the past. But ironically, as sophisticated, media-rich people, we can also be inherently suspicious of real experts. Speakers, writers or institutions sharing information provoke varying levels of trust. We tend to distrust information when the provider has something to gain by our acceptance of the information's validity (a used car salesman, for example). But some information has ethos, the quality of being inherently believable, being credible (for example, the grandmotherly woman in the fabric store who assures you that the "dry clean only" rayon fabric you're looking at can be thrown right in the washing machine and dryer!) Like charm, unfortunately, ethos may mean that people give trust where it hasn't really been earned.

And what about the personal and subjective feelings that accompany our quest for knowledge? Consider what an active step it is to be a questioning person. In our society, people are rewarded for having answers, not asking questions, so critical and objective inquiry is difficult. We're reluctant to admit our ignorance. We tend to label nescience (the pure state of not knowing) as ignorance (not knowing what we should), and we really dislike the feeling that we don't know something we think we should. Remember our own time as students. In class we'd sit and stew in our confusion rather than ask a real question, and we still roll our eyes over one more interruption from the class

"gunner." (You know the gunner: always asks an alleged question to prove how much he or she actually knows about the subject.) A major challenge to knowledge discovery is the perception that others know more than we do. The greater this gap appears to us, the greater our anxiety, as Richard Saul Wurman loved to remind us. So intellectual courage and personal motivation have to be present for active inquiry.

Many writers, Carolyn Kulthau and others, have researched substantively and written eloquently about affect and the research process, but let me try to frame it just a little differently. Individualism is the essence of creativity and can often be just as effective (and more natural) arising serendipitously. In many years of teaching a course on information gathering for mass media, it became clear to me how different the methods of reporters were to librarians. Not because reporters didn't approach their information-gathering process systematically, but because they embraced the notion that you start with the thread you have and trace it to other threads until the fabric begins to take shape. So anything that moves a student over the hump, any first step is a legitimate first step. Any first step is essentially better than no first step, and there are many pathways to the same end. Let's be clear then about the barriers we face: a knowledge discovery process is just as reasonable as a circular one, like riding the "link" around the sights where you can get on anywhere and still see them all. But we struggle to teach a process that is generalizable and objective, linear rather than circular. And I'm still intrigued by the early experiments with Eliza, the computer psychotherapist in the 1970's described by Jerome Weizenbaum. Eliza was little more than a language-parsing program. "How are you feeling today?" Eliza would ask. "Oh, a little tired," you might reply. "Say more about 'tired'." Eliza would respond sympathetically. Yet even when they knew they were talking to a computer program, people evidently felt better, especially since they thought Eliza was not judging them negatively. So online tutorials are interesting and good because they overcome one barrier, the desire to not feel stupid in the presence of others, as long as they don't run the risk of making the knowledge process feel as though you are one step away from being busted. ("WRONG!! Want to play again?") Eliza wouldn't talk that way.

Let's try to hold the big ideas as we go along, and not lose sight of any one of them because they all work together and build toward the larger view.

Big Idea Number 2

We are data rich and knowledge poor.

Is it possible to simultaneously have an enormous amount of information at our fingertips unaccompanied by little true understanding of anything? A negative view of the information age, offered by Bill McKibben, would say we are in the age of missing information, we lack the vital knowledge that humans have always possessed. We've moved from natural sources of information to remote or electronic ones, and have suffered a disconnection from the natural world. In fact, the world we live in may be nearly incomprehensible to most of us. This disconnection from the natural or physical world may also have the more serious consequences of making reality remote, objective ... other. None of us could build a cell phone although we all can use one, but very few of us could even make soap or raise poultry. We simply have placed our confidence in the outside world -- trusting that these things (and whatever we will need) will be produced by others, that the essential knowledge base is secure somewhere, somehow, in someone. And it isn't a source of concern really, until something confronts you to look at how your habits of mind may have changed from earlier times.

Here is a hypothetical question: what if you were put back in time. The Middle Ages for example, as a Connecticut Yankee in King Arthur's Court? What would be of value to you, what could you do? This is a question that will intrigue any student. The athletic young men will confidently say they'd be a knight or a soldier or something like that, the intelligent young women will quickly come to realize that most of their everyday knowledge would likely get them burned at the stake as a witch if they actually tried to use any of it! Think about the series *Frontier House* or *Colonial House* which have recently run on PBS. Perhaps I was not the only person who decided to see if I could find and follow a 19th century text to see if I could figure out how to do some of these things to survive if need be. Take raising chickens, for example. Do you just acquire a chicken of some sort, feed it ... what? Do you have to give it water? Will it peck and bite me if I try to get an egg out of the nest. And just how many hens can a single rooster handle anyway? I was anxious. I had information anxiety! A gap between my knowledge need and the data. Now the problem with the 19th century text was that all the instructions rested on a knowledge base I didn't have either. But a quick web search produced pretty decent instructions on poultry rearing (and soap making). And although the perfect authoritative

resource exists somewhere, the information I found was far better than none, and since I was only casually motivated, I'd be inclined to follow it. Maybe just the way I would have watched and learned from an aunt, or mother, or grandmother in an earlier time, or listened to them argue about the best way to do it. And on what basis did I decide on the reliability of this information? Were the instructions clear, did they seem to make sense, were they "doable? (i.e., could I envision success at the end if I followed them?) Now we know the ability to keep a chicken from perishing under my immediate care does not make me a poultry breeder. But I'm not planning on breeding poultry. I was merely curious and, while the information I found seemed good enough and the consequences for finding poor information were minor, the fun of musing over my ignorance and poking around a little was significant. It was a cheerful state of not knowing. But maybe, just maybe, if you wanted to sap every ounce of curiosity, energy and confidence out of me, one way to do it would be to put me through a 50-minute boot camp on search strategy and evaluating sources.

So here is another paradox: although we are almost totally reliant on external sources of knowledge, in many cases the consequences aren't all that serious for information that is good enough and moves us from nescience toward understanding. Because we live in the age of missing information, we have long since placed our blind trust in the unseen, in the expert, the specialist, the professional, whomever, to make it all work on our behalf. To question the source isn't as natural to us as it might appear. If we really stopped to question everything, we'd have to live in a world where, if it depended on our personal in-depth knowledge, the plane just might tumble out of the sky at any time. Our joy, even our success, in modern life often comes from not understanding, not questioning, just unconscious believing and acceptance. So perhaps surprisingly, our students, as worldly and naturally skeptical as they are, raised in a mass media world, confront much of a very complex world with a natural trust, an inevitable habit of mind that has to be actively engaged and intellectually and emotionally provoked to change.

Big Idea Number 3

Ideas are more than the processing of information.

The mind is an entity capable of original thought and ideas. It synthesizes, creates and is capable of "gestalt" mental leaps. Some of our most powerful ideas may come from little or no information e.g. love conquers all, a man is as good as his word,

blondes have more fun. But new information requires a conceptual framework as all good instruction librarians know, that pre-existing organizing structure to create knowledge from data. In fact information may be meaningless unless ideas bring it into a coherence that results in knowledge. In the absence of a conceptual framework, the mind will search for one, will seek to create one, is likely to create an incorrect framework, place the information in an incorrect framework, "lose" the information or even fail to be conscious of the information. I'll share a conceptual framework anecdote with you. A few years ago I had just returned from a trip out West and still fresh with memories of exotic towns like Coeur d'Alene Idaho, when I was strolling the booths at the Ann Arbor Street Art Fair and the first booth I came to was a weaver from Coeur D'Alene Idaho. A coincidence? Or more! "How far she's come I thought, and what a beautiful place to be an artist--she's very lucky--I wonder if I can see any reflection of the West in her work?" All ideas constructed solely around an impression of a mountain town with the sound of north streams and dense woods and misty peaks. Had it not been for that conception and conceptual framework of the town, I likely wouldn't have registered her work. It would have been just one more booth of ponchos, scarves and bags (and I tend toward pottery). On a more profound level La Rochefoucauld suggests: "I think I would never be in love, if I had never heard of love."

Ideas then are powerful integrating patterns, so much so that Theodore Roszak argues that the purpose of education should be to teach "master ideas." The ideas and values in our civilization give shape and meaning to our experience, not the other way around. A powerful argument, yet a provocative one. Where does archetype leave off and stereotype begin? Hero and Goddess, Jock and Bimbo. But what we must understand and never underestimate is the powerful tug the pre-existing "idea" (including stereotype) has upon our consciousness, and how difficult it is to dislodge through information or even experience. Roszak believes it takes one powerful idea to dislodge another: Might makes right - blessed are the peacemakers.

And what do we know about learning? Students who know a lot find it easier to learn more, students who know little have little basis for learning more and students who have included errors in learning may only confirm those errors to learn new things. This is one of the inherent difficulties of trying to teach knowledge work apart from context. Most students, in fact most faculty, do not have an understanding of how the human mind learns and even some degree of

self-awareness can create enormous insight. Knowledge work within the framework of ideas will always be easier than information gathering as a more generalized abstract process.

Big Idea Number 4 **All information is filtered.**

As individuals we filter information: out of necessity, by choice based on taste or interest or values, or even unconsciously. Filtering is an intrinsic human process, but perhaps a true defense mechanism in modern life. Neil Postman has gone as far as to describe our condition as a kind of information AIDS, an overwhelmed information immune system. Means of filtering include a lack of awareness, avoiding/ignoring the information sources, forgetting/ignoring the received information and external filters that result in the selective gathering and transmission of information, for example, institutions, cultures, circumstances. "Time is a river" as Steve Winwood said in his song. Each one of us is dropped into the stream of time at one place, absorbing and taking along with us the memories, information, experience, and shared ideas of our generation as well as our knowledge cohort and our culture, but subject to unique memories and experiences that can significantly distinguish us.

Daniel Dennett explores Richard Haworth's idea of cultural "memes" -- the cultural equivalent of genes, selected and passed on in a culture (Mozart, Mother Theresa, Babe Ruth, Martin Luther King, Jr., hockey, embroidery, the Holocaust, Noah's Ark, "alls well that ends well"). You wonder: what memes will we pass on? Cultures filter information by failing to collect/record information, by failing to transmit it, by marginalizing it, and just by not seeing it exists. One of my favorite books is Laurel Ulrich's *A Midwife's Tale: the life of Martha Ballard*. Based on her diary, it is the journal of a revolutionary-war era woman who successfully delivered many hundreds of healthy babies over a 30 year period without losing a single baby or mother. Martha's words are 200 years old but Laurel Ulrich gave them life and we, over two centuries later, are truly listening.

If we take big idea number 3 and number 4, you have an instant perspective on the inherent tension in the old debate over "canon" (a conceivable core of knowledge that forms the basis of civilization). On one hand, an archetype establishes a definitive conceptual framework for knowledge, but it ignores many issues. The questions that never got asked, the systematic exclusion of information, the role of economics in information collection and transmission,

and the legitimacy of researchers to go back and pose new questions, thus discovering new answers (knowledge). Enlarging history is not the same thing as rewriting it.

Big Idea Number 5 **There is a unique nature to knowledge discovery within scholarly disciplines.**

If you want to start a lively discussion among a group of students, ask them if science is "harder" than other fields of study, if scientists or engineers are "smarter" than students majoring in English literature or psychology. Students have no idea how disciplines begin or how they establish and credential themselves, and most faculty and graduate students seldom consciously reflect on this process and may seldom explicitly communicate it to their students.. Students have no idea what a faculty member does all day (or why) in pretty much any discipline. But an awareness of how knowledge creation and discovery, and the cultures surrounding them, differ among disciplines is a critical foundation to understanding how this world operates.

Let's look closer at what characterizes inquiry in the sciences: it investigates and tries to provide answers about the physical world, uses a rigorous empirical method, constitutes the measure of truth through reproducible results, tends to be international and often collaborative, and most importantly requires an obvious depth of knowledge base and generally advanced mathematics. This last item thus makes much of science appear inaccessible for most non-scientists. So in most people's minds, science works, magic doesn't, science is about absolute truth. So then how to explain hormone replacement therapy, or failure to agree on just why the dinosaurs died out, or the sudden rise of the nut and egg from dietary foe to friend? Now we know we must distinguish between the empirical sciences like chemistry or biology and the more mathematical sciences like physics that benefit from clearer predictive models, but Thomas Kuhn in the *Structure of Scientific Revolutions* challenges the traditional view of scientific knowledge where new information builds linearly upon the old, providing an ever more accurate progression toward objective truth. Kuhn suggests an alternative view of the nature of scientific inquiry. He argues that "normal science" actually operates under broad paradigms defined as the basic scientific theory or model *and* the set of research problems they can solve *and* the methods used to solve those problems. So problem solving goes on under an existing paradigm and controversies, conflicts and contradictions are all part

of normal science. But true revolutions take place only after "normal science" has produced an overwhelming set of problems and results that can no longer be explained by an existing theory *and* a new paradigm has been constructed capable of predicting/explaining the new findings. So the Ptolemaic model of the universe was a perfectly useful paradigm that became untenable only after it ceased to explain adequately phenomena observed after the invention of the telescope. Obviously scientists are reluctant to abandon a paradigm and in fact must operate under a predictive model to maintain integrity of the scientific method. Scientists are, must be, innately conservative in that sense. This is a different way of looking at scientific theory than absolute truth. And we haven't even discussed the impact of external public policy pressures or social issues on the ostensibly "objective scientific process."

But then what of the social sciences? Are they just poor excuses for science, sort of half-baked, mushy, not quite rigorous enough to merit as much respect, not quite as deserving of the truth stamp? And is it less precise and predictable than the physical worlds just because they focus on the interaction between individuals and groups? In reality, although they're characterized as less precise, the social sciences actually follow a different set of methods to assemble a knowledge base. Quantitative research poses questions such as how many, how often, for how long? Qualitative research asks who, how, why. Triangulation (use of two or more methods to explore the same or different aspects of the same question) is a principle in social science inquiry to build an aggregate knowledge base and predictive theory. Do boys and girls learn more effectively in separate classrooms or schools? Is capital punishment a deterrent to crime? Will you be more successful in the business world if you are beautiful rather than plain?

The disciplines in the humanities engage in inquiry that explores meaning in products of the human heart and imagination (music, art, literature, dance, philosophy, architecture). They are interpretive in nature, advancing the knowledge base by identifying new questions less than definite answers. Knowledge discovery doesn't proceed in a linear fashion, but rather is a process of creation, interpretation, reaction, reinterpretation, re-creation and is essentially subjective in nature. In fact, one might define a "great" work as one that can persuade our interest and provoke new questions over a long period of time in a culture. In other words, a meme! Now anyone can say they like, or don't like, this painting, movie, book, building, so the humanities

suffer from the stereotype that they are "easier," that they may require less of an understood knowledge base or that interpretation (i.e., failure to agree) equals fuzzy, less precise thinking. The history and controversy surrounding the Dead Sea Scrolls illustrate this essentially interpretive nature of humanities research and how preconceived world views color that interpretation. The Scrolls controversy also highlights the conflict between individuals' right to own their scholarly work, including interpretive rights, versus the rights of scholarly access to information and responsibility to the community of scholars. On one hand, the argument goes, only scholars who have spent decades piecing together the scrolls and translating them have the right to interpret them. The alternative view believes the text belonged to the world's scholarly community and should have been shared from the beginning. There is often visceral conflict in value systems that arise in subject inquiry, and validity in interpretation is tested/altered by subsequent inquiry. Students need to be consciously aware of what is involved in assembling a knowledge base in the humanities adequate for interpretation, especially when inquiry is individual and often bounded by language, culture, or national boundary.

Perhaps a good way to think of "interdisciplinary" is that the same question can be posed by many disciplines, but each with a different road map to knowledge discovery, or that the same thing can provoke many questions.

Bid Idea Number 6

Mass media operate in a consumer market and stories are powerful.

As I mentioned earlier, some many years ago now, I taught a course for communication majors: "Information Gathering for Mass Media," and it completely changed my view as an academic librarian. I'd spent most of my time (reference and instruction) herding students away from popular (non-credentialed) information because I didn't truly understand it. If I had, I'd never have experienced that sinking feeling of seeing my words garbled in an interview with the campus newspaper! Just because faculty do not want to see popular sources cited in their students papers does not change the reality that this content has inescapable power and unique value in knowledge discovery. Where do student get their ideas, anyway, decide what's hot and what's not? And why, since we and the professoriate have been engaged in this battle like the war of the roses, have we been unable to stamp out its use!? Yes, mass

media and the popular press operate in a consumer market where "accuracy" -- relaying facts faithfully -- is the prevailing standard for truth. But James Atlas argues that accuracy and fact are not absolutes at all, but that mass media communicates the essential idea behind the facts--a string of facts does not necessarily convey a true or clear idea.

Mass media covers, interprets, and communicates ideas and information from the scholarly arena, but targets those ideas with high audience appeal, and often simplified or without necessary context. And if you look at the ownership of our most powerful information conglomerates, a small handful of people hold enormous power in what we see, read, and hear. So the lines between news and fact and fiction are sometimes indistinguishable. For example, it is not unusual to see a local news channel covering child abuse the evening before a made-for-TV movie on the same subject is shown. This isn't coincidence, but planned programming. And as Steve Martin says in *Planes Trains and Automobiles*, "Try having a point!" There has to be a point, an angle, a story, and the point, angle, story makes the facts add up to more than the sum of their parts. It creates a fabric of true pattern out of threads. If you want to communicate successfully in mass media, you had better be able to high-concept an idea in 25 words or less.

Further, clear voices add texture to fact and narrative. As James Atlas points out about journalism, "We can't know everything; sometimes a fact is just a fact. The truth is in the prose, the style, the quality of representation that compels us to believe." The main thing we don't fully understand and respect as librarians is the extraordinary power of narrative to convey a truth or idea or to evoke understanding on both an emotional and cognitive level. Stories are intrinsic integrators of information, they work on a fundamental level to make us feel things, believe things, understand things, and they grab our imagination and don't let go of it. The Shoah project of personal holocaust narratives, *Saving Private Ryan*, Vera Brittain's memoir of being a nurse in World War I *Testament of Youth*, all have a power that all the text books and journal articles in the world will never command. And someone newly diagnosed with cancer, no matter how educated, how skilled in finding information, may find unexpectedly as much or more comfort from a survivor's story in Sunday's *Parade Magazine*. In fact a "story" can provide exactly the conceptual framework that will make credentialed information "stick" as part of knowledge discovery. So don't ask students to abandon a story that engages them; invite them to follow the trails that

lead from that to further places. Share the understanding that we are drawn to the well-told story, not because we are intellectually shallow, but because we are human.

Big Idea Number 7

New technology creates new community.

Mothers of children with autism, people who raise labradoodles and people who want to buy them, roman shade makers and decoupagers, movie buffs and reiki practitioners, serial killers and child predators. An enormous amount has been researched, written, analyzed and debated about the ability of the Web and earlier online environments to offer spaces where individuals (who might otherwise be prevented by geography or social conventions) can function as members of new communities for knowledge or pure self-interest, for good or evil. But I think we need to be more self-reflective on exactly how we are injecting ourselves into more peripheral communities, and how community relations occur more subtly and quickly than we realized. How much literature have we all read about the new dynamics of reference service in the chat-reference environment? But what if we let go of this for a minute and think what it means to be out there as a buddy like "bubbles99" or "infogrrrrl", able to talk with students the way they talk with each other--as natural as breathing, an instant community, personally engaged. Consider this anecdote a faculty member shared with me just recently. He was teaching a linguistics class and wanted to make a point with a precise quote from the Bible and half-jokingly asked if any student had a Bible with them? A student raised her hand and said yes, she had a copy on her Blackberry, and proceeded to find it and read it to the class. An instant community of knowledge, student, teacher, and yes, technology. The technology is not in itself as important as the dynamics of interaction within and across the communities it makes possible. Instant messaging is a most immediate and powerful way to connect experience and wisdom with youth and innocence, and allows us to delightfully insinuate ourselves as teachers and colleagues into the spaces where students think, work, and play on an intellectual, emotional, and practical level.

Big Idea Number 8

Our most important information values are in direct conflict with each other.

I have often found myself saying to students that you don't truly know how much you believe in a

principle until it protects something you abhor. Nothing is more challenging than engaging the intellect of the young, or of any age for that matter, in exploring ideas and issues of extraordinary and inherent controversy. So I have come to believe that the heart of the problem is not just that reasonable people can disagree on matters of opinion or fact or principle. In fact, if we recall big idea numbers 1 through 4, it should surprise us that we can find consensus at all on many things. The heart of the problem is that the same values we may all hold are fundamentally at tension with one another.

Here are the big three:

- Privacy versus open access to information.
- Freedom of expression versus limits to expression
- Intellectual property versus free exchange of information

You can think, I am sure, of example of all three of these. "I have the right to protect myself by knowing if a convicted sexual predator lives next door." "As a citizen who has paid a debt to society, I have a right to live a private life." "The first amendment protects my right to read, view and watch pornographic material in private." "My child has a right to go the public library and be protected from exposure to pornographic materials; we have an obligation to set some limits on what is acceptable in a just society." "I have the right to benefit from my own creative work, in fact that benefit promotes knowledge creation and dissemination." "Some knowledge is too important to limit access, life-saving drugs should be available to those who need them."

Now, regardless of what side any of us might argue on any of these specific issues or thousands like them, we would recognize that we might believe in all these general values in the abstract, but find they can rarely all be honored equally in the specific. Sometimes you just have to choose one value over another in a situation, and accept that they cannot always be simultaneously honored. This one point so escapes not only our students, but escapes many otherwise reasonable people. Everyone has their limits, and one way to deal with issues of controversy is to see that the "principle" game is inherently rigged, it's not fair, and in general when someone says they believe in a principle absolutely, it may well be another way of saying they haven't yet confronted the one thing that tests their personal limits of belief.

Big Idea Number 9

Information shapes policy that affects people's lives (OR DOES IT?)

In 1992 I came across the transcript of the confirmation hearings in 1991 of then candidate for CIA director, Robert Gates. The testimony of the Soviet analysts suggested that their analysis during the 1980's was essentially filtered and shaped to meet the policy that guided U.S.-Soviet relations, and that they themselves felt some pressure to produce analysis that fit with policy directions at the time. The actual data they were sharing seemed to suggest an internal disintegration of the Soviet regime way before the Berlin wall fell, posing the question of whether the cold war lingered longer than necessary. We could spend an entire hour alone on the politicization of information, a phenomenon neither liberal nor conservative, but probably an institutional version of "all information is personal and subjective!" Or on "ideas exist without information," which is an institutional version of a conceptual framework that says I'll see it when I believe it. But the relation between information and policy reminds us of the consequences of knowledge discovery and the importance of striving beyond big idea numbers 1 through 4. Is global warming real and should we or shouldn't we sign the Kyoto accords. Is evolution really a theory and should creationism be reasonably noted as an alternative view? Should Vioxx be off the market or is it a personal choice? Research and data have their role. But policy also comes from other big ideas, and remember not all are based on information per se. Universal health care? U.S. development of hybrid cars? A viable energy policy? Abortion? Do we really think some of our greatest issues are the result of a lack of information? The point that is most often overlooked is that a policy not really constructed on information, no matter how much it might be justified on that basis, cannot be effectively challenged or supported by information. Much of our national debate flounders because in spite of all the information at our fingertips, the essential question has both sides believing they have captured the higher moral ground, based on ideas that exist apart from information.

Big Idea Number 10

Truth and reality are seldom absolutes.

Who can resist programs like "Stars without Makeup"? As a society we pay the highest prices for illusion, but relish seeing truth uncovered, myths debunked, deception exposed! We sit enthralled at

Lord of the Rings, and the power of narrative and image holds our imagination and instills faith in our hearts, even though we know the story is fantasy. And we marvel in the digital imagery that makes it possible, feeling it is an intrinsic part, like direction, of the very art form itself. Ah, but you'll say, that's the key, art is about imagination, not facts, and you're right. Interpretation can be subjective, should be variable, otherwise what's the point. I still like Oscar Handlin's view (although he used it to argue against separate undergraduate libraries) that a huge research library shouldn't frighten students, it should give them courage, because the collections were tangible evidence that not all the questions had been asked, not all the answers were known, and there was room for their ideas and work. If we think about Kuhn's perspective, science isn't about absolutes either. And what about "facts"? As James Atlas quotes Leonard Wolf about journalism: "The moment one begins to investigate the truth of the simplest facts which one has accepted as true, it is as though one had stepped off a firm narrow path into a bog or quicksand, every step one takes, one sinks deeper into the bog of uncertainty." Anyone who has tried to track the genealogy of their family or faithfully record the "stories told in a family quickly comes to know that.

So let's think about our students who are in the stage of cognitive growth and development Perry describes, where they are just making the final change from "absolutes" to acceptance that few things can be known absolutely and that most realities are in essence grey. Like all of us, but even more so, they live in this dichotomous tension where the quality and joy of life is much dependent on the fantastically created: film, music, food (a skittle is what??), games, even people: Homer -- Simpson that is -- or Shrek aren't real but maybe uber-real, just like Homer or the Golem -- all memes? Language is malleable and just like today, I may find a few sentences that need to be tweaked, and I'll change them and hope they are, because of my delivery or emphasis, the way you'll remember them, and I'll believe that's what I should have said anyway, so what does it matter? But our campuses are greatly concerned about personal ethics, both in the realms of professional and public life as well as on an institutional level. Plagiarism seems to be an epidemic, both on campus and among respected professionals, as all the news headlines tell us. It is all too tempting to blame technology that just makes it so easy, so much access to so much content that can't be tracked or traced. But this obscures the essential root of the problem. Like our other information values that are innately at tension with one another, we love illusion, illusion enriches our lives, is intrinsic to our

lives, and we all have the power to create illusion through our technologies. We ask our students to wrestle with controversy, weigh opinion, construct their own opinion, be original, and be conscious of where their ideas and facts came from, to give credit where credit is due and to have fresh ideas when very few ideas are fresh in the slightest. Facts are never so straightforward as they seem, and language isn't just the literal string of words but a fabric of meaning subject to an implicit compact between writer and reader, speaker and listener. And yet, we revere the truth, we have to set standards of intellectual integrity and somehow credential information in the process of knowledge discovery. What are your influences? Where did you get that idea? Is that a quote, or a free-for-the-taking "meme" (e.g., "Never throw good money after bad")? Plagiarism and intellectual dishonesty are real, and they should go down on your permanent record! But we know we won't truly engage on an intellectual level just by focusing on meticulous citation, of course that must be an ongoing and persistent dialogue of substance.

Back to Reality!

I'm sure at this point you're asking, "So just how do you teach these concepts in a 50 minute session?" The answer is you don't. (It takes at least 60 minutes as we have just seen!) But you will certainly find them, or the echoes of them in many, many of the courses your students take, woven into the fabric of the curriculum, and they are keystone ideas that can serve as a basis for your collaboration with other faculty as you work together to shape course-integrated instruction and curriculum-integrated programs. And once internalized, you will find you can weave them into your teaching so, when teaching in the classroom and at the reference desk, tuck them into the corners here and there. *I Love Lucy* is making a good run at meme status, attained only with the passage of time, as any student can discover who struggles to understand why this icon of American culture was at the time written about in *TV Guide*, and not the subject of immediate scholarly discourse!

Our Parallel Path To Knowledge Discovery -- Who's The Teacher??!

When I was young and poking around among several opportunities to decide what I wanted to do with my life, the odd thought struck me that being a librarian might just be something that I could see myself doing as an old person just as well as a young person. I don't know what made me think this

specifically. Obviously, being a librarian seemed unlike time-limited professions, being a ballerina, a wide receiver, an investment shark on Wall street, or a theoretical mathematician whose best work came pretty early on in a life. Perhaps I could see myself dressing well as an "older" woman like Angela Lansbury as Jessica in *Murder She Wrote*. But now I've had my original notion validated in reality. No day is like the day before, and just like our students, you have the chance to reinvent yourself a little every September. But right now we need to learn every bit as much as we teach. This means understanding how our students work, think, and behave, and perhaps becoming more like them in important ways rather than just trying to make them more like us. The latter is a losing battle because this world and the environment we all work in to a great extent is theirs, not just the future, but the present. It is the product of the young intellect as Douglas Tapscott points out, and will prevail no matter how much traditional power may still appear to reside in the hands of people with graying hair.

Here is something to think about. I suspect you all have some place on your campuses like this: a pathway worn by students across a grassy expanse or a shortcut between two buildings, a place students go outside of the sidewalks or paths the campus has created. It's well worn and you can try to fix it by putting up "don't walk" signs and throwing down grass seed repeatedly or putting up little fences, but it's a losing battle. Eventually, a wise grounds management just puts in a sidewalk, finally recognizing the obvious: that path represented the most sensible, natural way to get from one place to another, and should have been there all along. Consider our prevailing preoccupation with concern that the students think everything is digital or everything is on the Web. Surely we can admit that, if true, this would be a sensible, excellent state of affairs! Just so do we need to step back from our conventions and recognize the artifacts of knowledge discovery for what they are. I just finished nearly three years of coordinating our library management system implementation and I truly believe that our next large-scale system implementation will never look quite the same. Why? Because our systems are set up to provide secondary representation to the thing itself -- who will spend time intensively focusing on the mere representation of the thing via a MARC record when the item itself is right there for the taking?

And all this time over the past hour I haven't said the magic word once! Now, like Seti the Pharaoh in the *Ten Commandments*, with my dying breath I will

break my own law and speak the name of not Moses, but Google. Yes, Google is going to digitize 6 million volumes in the University of Michigan library and millions more from other libraries. The Bible and Koran, *Remembrance of Things Past* and the *DaVinci Code*, the *Journal of the American Medical Association* and the *Kenyon Review*, the Statistical Abstract of the United States (all the volumes of them), and the Gilgamesh epic. Things in English and Hungarian, Urdu and Korean, things from 1790 and 1990. And the entire world with an on ramp to the web will see all of some of it and at least some of all of it. How often do we say in research libraries that we preserve and collect not just for the present, but for the future? For not just our own faculty and students, but for a wider knowledge community. So I think consciously now, when our Latin American Studies specialist or African Studies specialist returns from a book-buying trip from parts of the world where materials can only be acquired locally, we can have confidence that those local communities will at least be assured their materials are somewhere, perhaps with access in ways undreamed of before. Of course there are intellectual property issues, but we're probably not surprised that writers want to be discovered and read, and authors are asking how they can make sure a copy of their book gets in the library so it can be digitized.

Before we even begin the shopworn discussion of whether people will read whole works on the screen or whether it is intellectually good to take content out of its whole context, let's look reality squarely in the face. I didn't know until the news announcement came out that Oxford and New York Public were part of the mix and it wouldn't surprise me at all if a week from now or a month from now or a year from now, a killer technology that will blow the doors off e-book readers and have the same culture altering affect as the iPod is unveiled. Neal Stephenson's *The Diamond Age* may be just a question of time. And remember above all, "library" is a meme that has persisted for thousands of years with no end in sight.

I used to think as I approached middle age, that the fullness and richness of life at that stage was characterized more by our ability to relinquish with grace the inevitable diminutions life wrought upon us. Now that I am rapidly passing through middle age to the next stage, I find this isn't energetic enough. It is another kind of deficit model where we just adapt to something missing. I prefer the active engagement with the present and active engagement with the future that moves from the grace of relinquishment to the passion of renewed embrace. And I urge us as a community of teachers to relearn, if we ever forgot it,

that to help others in the path of knowledge discovery we have to follow it joyfully and truly ourselves.

REFERENCES

- Atlas, J. (1991). Stranger than fiction. *The New York Times Magazine*, June 23, 21-43.
- CIA Director Confirmation, Senate Intelligence Committee Hearings, 2 October 1991 (transcript).
- Dawkins, R. (1989). *The selfish gene*. New York: Oxford University Press.
- Dennett, D. (1991). A gadfly's view. In *Teaching and Technology: The Impact of Unlimited Information Access on Classroom Teaching* (pp. 83-98). Ann Arbor, Michigan: Pierian Press.
- Handlin, O. (1987). Libraries and learning. *American Scholar*, 56, 205-218.
- Kuhn, T. (1970). *The structure of scientific revolution*. Chicago: The University of Chicago Press.
- McKibben, B. (1992). *The age of missing information*, New York: Random House.
- Perry, W. (1970). *Intellectual and ethical development in the college years: A scheme*. Cambridge, Mass.: Harvard University Press.
- Postman, N. (1992). *Technopololy*. New York: Knopf.
- Roszak, T. (1994). *The cult of information: The folklore of computers and true art of thinking*. Berkeley: University of California Press.
- Stephenson, N. (1995). *The diamond age*. New York: Bantam Books.
- Tapscott, D. (1998). *Growing up digital: The rise of the net generation*. New York: McGraw-Hill.
- Ulrich, L. (1990). *A midwife's tale: The life of Martha Ballard, based on her diary, 1785-1812*. New York: Knopf.
- Weizenbaum, J. (1979). *Computer power and human reason*. San Francisco: W.H. Freeman.
- Wurman, R. S. (1989). *Information anxiety*. New York: Doubleday.
-