

3 Day Practicum



Readings

"We are a generation in transition. Generally reared in a print period, but increasingly required to function electronically. We are required to teach in a way that we have never been taught!"

-Dale Spender, Nattering on the Net

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There are three key readings for this course, they are:

“Educating the Net Generation” by Don Tapscott, from Educational Leadership.

“Understanding How We Learn” by Dr Julia Atkin, from Christchurch ICT Cluster Seminar
-model of integral learning
-Herrmann’s model applied to ICT

“The Question is the Answer- Creating Research Programs for An Age of Information” by Jamie McKenzie, from his web site www.fromnowon.org

Quotes from practicum staff...
-page 25

Reading One:

Educating the Net Generation

by Don Tapscott

from Educational Leadership 1998

Every time I enter a discussion about efforts to get computers into schools, someone insists that computers aren't the answer. "It won't help to just throw computers at the wall, hoping something will stick. I've seen lots of computers sitting unused in classrooms."

Agreed. Computers alone won't do the trick. They are a necessary but insufficient condition for moving our schools to new heights of effectiveness. We've still got to learn how best use this technology. And I have become convinced that the most potent force for change is the students themselves.

Why not look to the kids? Because they are different from any generation before them. They are the first to grow up surrounded by digital media. Computers are everywhere-

in the home, school, factory, and office- as are digital technologies- cameras, video games, and CD-ROMS. Today's kids are so bathed in bits that they think technology is part of the natural landscape. To them, digital technology is no more intimidating than a VCR or a toaster. And these these new media are increasingly connected by the Internet, that expanding web of networks that is attracting one million new users a month.

The Net Generation

The Net affects us all-the way we create wealth, the nature of commerce and marketing, the delivery system for entertainment, the role and dynamics of learning, and the nature of government. It should not surprise us that those first to grow up with this new medium are defined by their relationship to it. I call them the Net Generation- the N-Geners.

According to Teenage Research Unlimited (199-), teens feel that being online is as 'in' as dating and partying! And this exploding popularity is occurring while the Net is still in its infancy and, as such, is painfully slow: primitive: limited in capabilities:

lacking complete security: reliability: and ubiquity: and subject to both hyperbole and ridicule. Nevertheless, children love it and keep coming back after each frustrating experience. They know its potential.

What do students do on the Net? They manage their personal finances: organise protest movements, check facts, discuss zits: check the scores of their favorite team and chat online with its superstars: organise groups to save the rain forest: cast votes: learn more about the illness of their little sister: go to a birthday party; or get video cops from a soon-to-be-released movie.

Chat groups and computer conferences are populated by young people hungry for expression and self-discovery. Younger kids love to meet people and talk about anything. As they mature, their communications center on topics and themes. For all ages, -"E-mail me" has become the parting expression of a generation.

Digital Anxiety

For many adults, all this digital activity is a source of high anxiety. Are kids really benefiting from the digital media? Can technology truly improve the process of learning, or is it dumbing down and misguiding educational efforts? What about Net addiction? Is it useful for children to spend time in online chat rooms, and what are they doing there? Are some becoming glued to the screen? What about cyberdating and cybersex? Aren't video games leading to a violent generation? Is technology stressing kids out- as it seems to be doing to adults? Has the Net become a virtual world- drawing children away from parental authority and responsible adult influence- where untold new problems and dangers lie? What is the real risk of online predators, and can children be effectively protected? How can we shield kids from sleaze and porn? As these children come of age, will they lack the social skills for effective participation in the work force?

These questions are just a sampling of the widespread concern raised not just by cynics, moralists, and technophobes but also by reasonable and well-meaning educators, parents, and members of the community.

Everybody, relax. The kids are all right. they are learning, developing and thriving in the digital world. They need better tools, better access, better services- *more* freedom to explore, not less. Rather than convey hostility and mistrust, we need to change *our* way of thinking and behaving. This means all of us- parents, educators, lawmakers, and business leaders alike.

Digital kids are learning precisely the social skills required for effective interaction in the digital economy. They are learning about peer relationships, teamwork, critical thinking, fun, friendships across geographies, self-expression, and self-confidence.

Conventional wisdom says that because children are multitasking- jumping from one computer based activity to another- their attention span is reduced. Research does not support this view. Ironically, the same people who charge that today's kids are becoming "glued to the screen" also say that kids' attention spans are declining.

At the root is the fear that children will not be able to focus and therefore will not be able to learn. This concern is consistent with the view that the primary challenge of learning is to absorb specific information. However, many argue- that the content of a particular lesson is less important than learning how to learn. As John Dewey wrote:

Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only the particular thing he is studying at the time. Collateral learning may be and often is more important than the spelling lesson or lesson in geography or history that is learnt. (1963)

The Challenge of Schooling

The new technologies have helped create a culture for learning (Papert, 1996) in which the learner enjoys enhanced interactivity and connections with others. Rather than listen to a professor regurgitate facts and theories, students discuss ideas and learn from one another with the teacher acting as a participant in the learning. Students construct narratives that make sense out of their own experiences.

Initial research strongly supports the benefits of this kind of learning. For example, in 1996, 33 students in a social studies course at California State University in Northridge were randomly divided into two groups, one taught in a traditional classroom and the other taught virtually on the Web. The teaching model wasn't fundamentally changed- both groups received the same texts, lectures, and exams. Despite this, the Web-based class scored, on average, 20 percent higher than the traditional class. The Web class had more contact with one another and were more interested in the class work. The students also felt that they understood the material better and had greater flexibility to determine how they learned (Schutte, n.d.).

The ultimate interactive learning environment is the Internet itself. Increasingly, this technology includes the vast repository of human knowledge, the tools to manage this knowledge, access to people, and a growing galaxy of services ranging from sandbox environments for preschoolers to virtual laboratories for medical students studying neural psychiatry. Today's baby will tomorrow learn about Michelangelo by walking through the Sistine Chapel, watching Michelangelo paint, and perhaps stopping for a conversation. Students will stroll on the moon. Petroleum engineers will penetrate the earth with the drill bit. Doctors will navigate the cardiovascular system. Researchers will browse through a library. Auto designers will sit in the back seat of the car they are designing to see how it feels and to examine the external view.

Eight shifts of Interactive Learning

The digital media is causing educators and students alike to shift to new ways of thinking about teaching and learning.

From linear to hypermedia learning. Traditional approaches to learning are linear and date back to using books as a learning tool. Stories, novels and other narratives are generally linear. Most textbooks are written to be tackled from the beginning to the end. TV shows and instructional videos are also designed to be watched from beginning to end.

But the N-Gen access information is more interactive and non-sequential. Notice how a child channel surfs when watching television. I've found that my kids go back and forth among various TV shows and video games when they are in the family room. No doubt that as TV becomes a Net appliance children will increasingly depend on this nonlinear way of processing information.

From instruction to construction and discovery. The scandal of education is that every time you teach something you deprive a child of pleasure and benefit of discovery (Pommerau, 1996, p.68). With new technologies we will experience a shift away from traditional pedagogy to the creation of learning partnerships and learning cultures. This is not to say that teachers should not plan activities or design curriculums. They might however design the curriculum in partnership with learners or even help learners design the curriculum themselves.

This constructivist approach to teaching and learning means that rather than assimilate knowledge that is broadcast by an instructor, the learner constructs knowledge anew. Constructivists argue that people learn best by *doing* rather than simply by listening. The evidence supporting constructivism is persuasive but that shouldn't be too surprising. When youngsters are enthusiastic about the fact or concept that they themselves discovered they will better retain the information and use it in creative meaningful ways.

From teacher-directed to student-centered education. the new media focus the learning experiences on the individual rather than on the transmitter. Clearly, learner-centered education improves the child's motivation to learn.

The shift from teacher-centered to learner-centered education does not suggest that the teacher is suddenly playing a less important role. A teacher is equally crucial and valuable in the learner-centered context, for he or she creates and structures what happens in the classroom.

Learner-centered education begins with an evaluation of abilities, learning values, social contexts, and other important factors that affect the student. Evaluation software programs can tailor the learning experience for each individual child. Learner-centered education is also more active with students discussing, debating, researching, and collaborating on projects with one another and with the teacher.

From absorbing material to learning how to navigate and how to learn. This means learning how to synthesize, not just analyze. N-Geners can assess and analyze facts- a formidable challenge in a data galaxy of easily accessible information sources. But more important, they can synthesize. They are engaged in information sources and people on the Net, and then they construct higher-level structures and mental images.

From school to lifelong learning. for young baby boomers looking forward to the world of work, like often felt divided- between the period when you *learned* and the period when you *did*. You went to school and maybe to university and learned a trade or profession. For the rest of your life your challenge was simply to keep up with developments in your field. But things have changed. Today, many boomers reinvent their knowledge base constantly. Learning has become a continuous, lifelong process. The N-Gen is entering a world of lifelong learning from day one and unlike the schools of the boomers, today's educational system can anticipate how to prepare students for lifelong learning.

From one-sized-fits-all to customised learning. The digital media enables students to be treated as individuals- to have highly customised learning experiences based on their backgrounds, individual talents, age levels, cognitive styles and interpersonal preferences. As Papert puts it:

What I see isflexibility that could allow every individual to find personal paths to learning. This will make it possible for the dream of every progressive educator to come true: In the learning environment of the future, every learner will be 'special'. (1996, p.16)

In fact, Papert believes in a 'community of learning' shared by students and teachers:

Socialisation is not the best done by segregating children into classrooms with kids of the same age. The computer is a medium in which what you make lends itself to be modified and shared. When kids get together on a project, there is abundant discussion: they show it to other kids, other kids want to see it, kids learn to share knowledge with other people-much more than in the classroom. (1996, p.11)

From *learning as torture to learning as fun*. Maybe torture is an exaggeration, but for many kids, class is not exactly the highlight of their day. Some educators have decried the fact that a generation schooled on *Sesame Street* expects to be entertained at school- and to enjoy the learning experience. They argue that learning and entertainment should be clearly separated.

Why shouldn't learning be entertaining? In *Merriam-Webster's Collegiate Dictionary*, the third definition of the verb *to entertain* is "to keep, hold, or maintain in the mind" and "to receive and take consideration." In other words, entertainment has always been a profound part of the learning process, and teachers throughout history have been asked to convince their students to entertain ideas. From this perspective, the best teachers were the entertainers. Using the new media, the learner also becomes the entertainer and, in doing so, enjoys, is motivated toward, and feels responsible for learning.

From the teacher as transmitter to the teacher as facilitator. Learning is becoming a social activity, facilitated by a new generation of educators.

The topic is saltwater fish. The 6th grade teacher divides the class into teams, asking each team to prepare a presentation on a fish of its choice. Students have access to the Web and are allowed to use any resources. They must cover the topics of history, breathing, propulsion, reproduction, diet, predators and 'cool facts.' They must also address questions to others their team or to others in the class, not to the teacher.

Two weeks later, Melissa's group is first. The students have created a shark project home page with hot links for each topic. As the students talk, they project their presentation onto a screen at the front of the class. They have different video clips of different types of sharks and also a clip from Jacques Cousteau discussing the shark as an endangered species. They then use the Web to go live to Aquarius, an underwater site located off the Florida Keys. The class can ask questions of the Aquarius staff, although most inquiries are directed to the project team. One such discussion focuses on which is greater, the dangers posed by sharks to humans or the dangers posed by humans to sharks.

The class decides to hold an online forum on this topic and invites kids from classes in other countries to participate. The team asks students to browse through its project at any time, from any location, because the forum will be up for the rest of the school year. In fact, the team decides to maintain the site by adding new links and fresh information throughout the year. The assignment becomes a living project. Learners from around the world find the shark home page helpful and build links to it.

In this example, the teacher acts as consultant to the teams, facilitates the learning process, and participates as a technical consultant on the new media. The teacher doesn't have to compete with Jacques Cousteau's expertise on underwater life; her teaching is supported by his expertise.

Turning to the Net Generation

Needless to say, a whole generation of teachers needs to learn new tools, new approaches, and new skills. This will be a challenge, not just because of resistance to change by some teachers, but also because of the current atmosphere of financial cutbacks, low teacher morale, increased workloads, and reduced retraining budgets.

References

de Pommereau, I. (199~, April 21). Computers give children the key to learning. *Christian Science Monitor*, p.68.

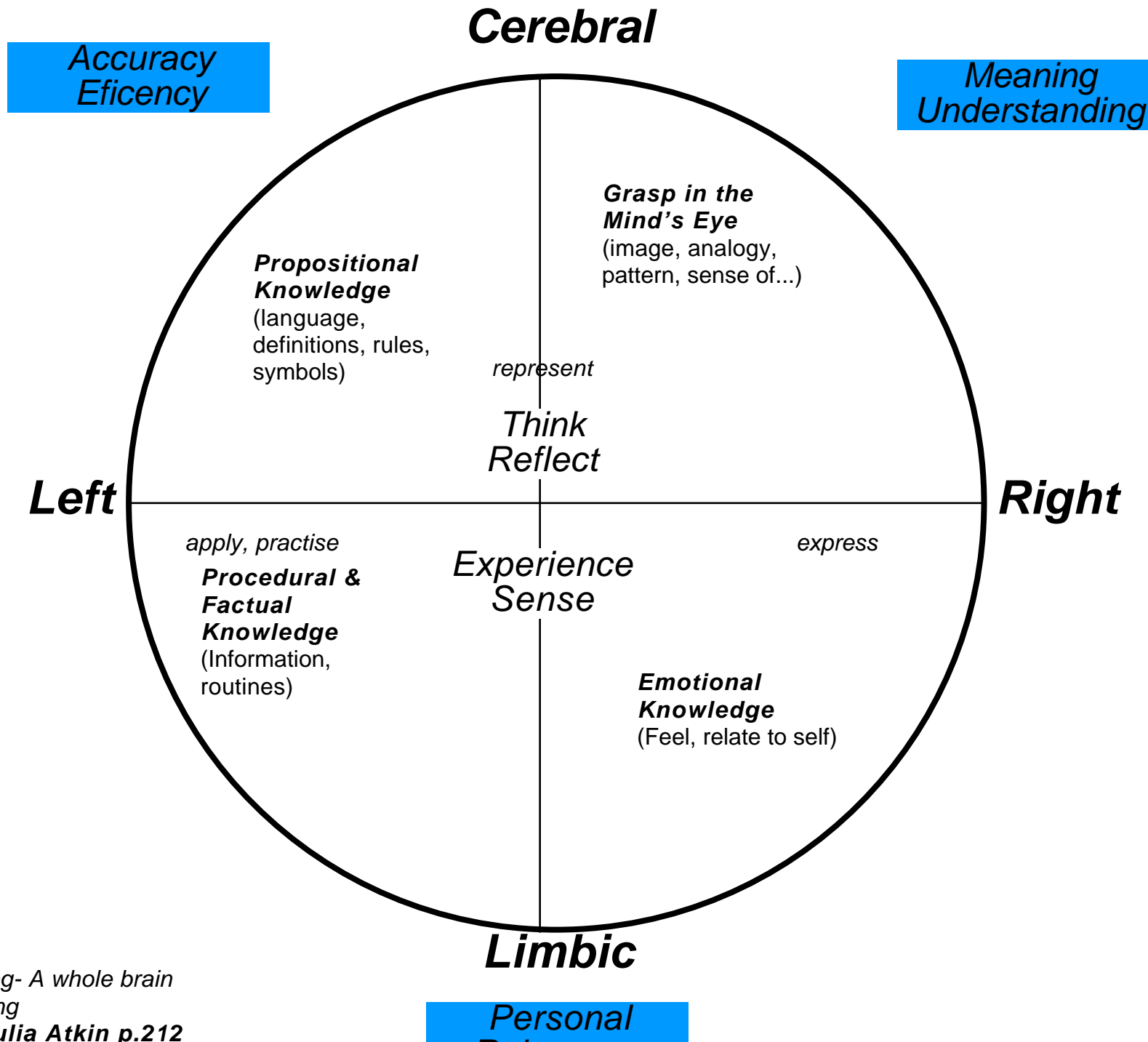
Dewey, J. (1963). *Experience and education* London: Collier books.

Papert, S. (1996). *The connected family: Bridging the digital generation gap*. Marietta, GA: Longstreet Press.

Schutte, J.G. (n.d.) *Virtual teaching in higher education* [On-line]. Available: <http://www.csun.edu/sociology/virtexp.htm>

Teenage Research Unlimited, Inc. (199~ Spring). Teenage marketing and lifestyle update. Northbrook, IL. Author.

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Integral Learning- A whole brain model of learning
 -from Julia Atkin p.212

Opportunities for using ICT tools & resources...

World View & Questions

State, articulate... **Learning Outcomes** *Understand...*

Learning Focus

*Facts, procedures,
examples, skills...*

*Relate to personal
life & values...*

Ways of Knowing

World View & Questions

Opportunities for using ICT tools & resources...

Reading Three:

The question is the answer.

***Creating Research Programs
for An Age of Information***

by Jamie McKenzie



please go to:

<http://www.fno.org/oct97/question.html>

"Once you have learned how to ask relevant and appropriate questions, you have learned how to learn and no one can keep you from learning whatever you want or need to know."

Neil Postman and Charles Weingartner

Teaching as a Subversive Activity

Additional reading:

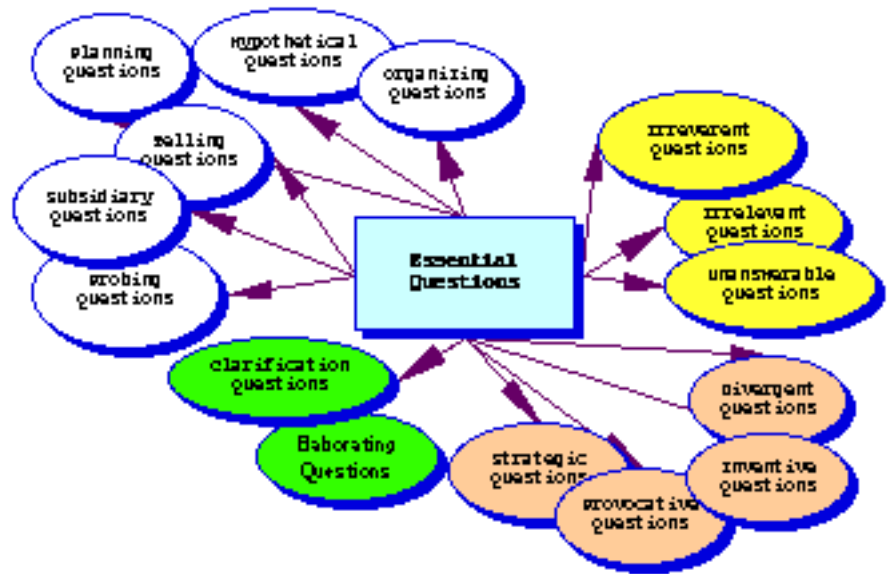
A Questioning Toolkit

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Each district should create a Questioning Toolkit which contains several dozen kinds of questions and

questioning tools. This Questioning Toolkit should be printed in large type on posters which reside on classroom walls close by networked, information-rich computers.

Portions of the Questioning Toolkit should be introduced as early as Kindergarten so that students can bring powerful questioning technologies and techniques with them as they arrive in high school.



[home](#)

[Essential Questions](#)

[Telling Questions](#)

[Organizing Questions](#)

[Clarification Questions](#)

[Elaborating Questions](#)

[Provocative Questions](#)

[Divergent Questions](#)

[Subsidiary Questions](#)

[Planning Questions](#)

[Probing Questions](#)

[Strategic Questions](#)

[Unanswerable Questions](#)

[Irrelevant Questions](#)

[Irreverent Questions](#)

[Hypothetical Questions](#)

[Sorting & Sifting Questions](#)

[Inventive Questions](#)

Essential Questions

These are questions which touch our hearts and souls. They are central to our lives. They help to define what it means to be human.

Most important thought during our lives will center on such essential questions.

- What kind of friend shall I be?
- Who will I include in my circle of friends?
- How shall I treat my friends?
- How do I cope with the loss of a friend?
- What can I learn about friends and friendships from the novels we read in school?
- How can I be a better friend?

If we were to draw a cluster diagram of the **Questioning Toolkit**, **Essential Questions** would be at the center of all the other types of questions. All the other questions and questioning skills serve the purpose of "casting light upon" or illuminating **Essential Questions**.

Most **Essential Questions** are interdisciplinary in nature. They cut across the lines created by schools and scholars to mark the terrain of departments and disciplines.

Essential Questions probe the deepest issues confronting us . . . complex and baffling matters which elude simple answers: Life - Death - Marriage - Identity - Purpose - Betrayal - Honor - Integrity - Courage - Temptation - Faith - Leadership - Addiction - Invention - Inspiration.

The greatest novels, the greatest plays, the greatest songs and the greatest paintings all explore **Essential Questions** in some manner.

Essential Questions are at the heart of **the search for Truth**.

Many of us believe that schools should devote more time to **Essential Questions** and less time to **Trivial Pursuit**.

One major reform effort, the Coalition of Essential Schools, has made **Essential Questions** a keystone of its learning strategy. ([Visit the Coalition Web site](#)).

Essential Questions offer the organizing focus for a unit. If the U.S. History class will spend a month on a topic such as the Civil War, students explore the events and the experience with a mind toward casting light upon one of the following questions, or they develop **Essential Questions** of their own . . .

- Why do we have to fight wars?
- Do we have to fight wars?
- How could political issues or ideas ever become more important than family loyalties?
- Some say our country remains wounded by the slavery experience and the Civil War. In what ways might this claim be true and in what ways untrue? What evidence can you supply to substantiate your case?
- Military officers often complain that the effective conduct of modern war is impeded by political interference and popular pressures on the home front. To what extent did this also prove true during the Civil War?
- How can countries avoid the kind of bloodshed and devastation we experienced during our Civil War?
- How much diversity can any nation tolerate?
- Who showed greater bravery and courage, the front line soldiers and the nurses who tended to the wounded and dying or the leaders of the war effort?
- Should there be a law against war profiteering?

Subsidiary Questions

These are questions which combine to help us build answers to our **Essential Questions**. Big questions spawn families of smaller questions which lead to insight. The more skillful we and our students become at formulating and then categorizing **Subsidiary Questions**, the more success we will have constructing new knowledge. All of the question categories listed and explained below are types of **Subsidiary Questions**. We have several strategies from which to choose when developing a comprehensive list of **Subsidiary Questions** for our project:

We can brainstorm and list every question which comes to mind, utilizing a huge sheet of paper or a word processing program or a graphical organizing program such as **Inspiration** (<http://www.inspiration.com>), putting down the questions as they "come to mind." Later we can move these around until they end up along side of related questions. This movement is one advantage of software. This approach has the benefit of spontaneity. •We can take a list of question categories like the one outlined in this article and generate questions for each category. This approach helps provoke thought and questions in categories which we might not otherwise consider.

In the (condensed) illustration below, a team is pondering the following **Essential Question**:

What is the best way for our school to involve students in the use of e-mail?

They begin by listing every question they can think up. They have one member type the list into the outlining part of **Inspiration**. They could use a word processor instead, but **Inspiration** will automatically convert their outline into a variety of diagrams and will allow them to move questions around later.

Best way to involve students in the use of e-mail?

Worst that can happen? Potential benefits? Obstacles which must be overcome? Available resources? Sufficient resources? Additional resources? Good models? How prepare students? How prepare parents? Relationship to discipline code? Timing? Who does what? Assessing progress?

This outline is transformed in seconds by a simple mouse-click into the following cluster diagram . . .

The lack of order and logic should be immediately visible.

This diagram needs to be re-drawn.

No problem.

Point. Click. Drag!

In just 4-5 minutes, we have a cluster diagram which groups (and colors) questions.

Different types of questions accomplish different tasks and help us to build up our answers in different ways.

We must show our students the features of each type of question so they know which combination to employ with the essential question at hand. We don't want them reaching into their toolkit blindly, grasping the first question which comes to mind.

No sense grabbing a screw driver when a wrench is needed. No use seizing the hammer when a saw is required. We want them to reach for the question which matches the job.

Hypothetical Questions

These are questions designed to explore possibilities and test relationships. They usually project a theory or an option out into the future, wondering what might happen if...

Suppose the earth had no moon. What if the South had won the Civil War?

Hypothetical Questions are especially helpful when trying to decide between a number of choices or when trying to solve a problem.

When we began to generate questions which would help us decide whether or not to offer e-mail accounts to our students, we asked . .

What's the worst that might happen? What are the potential benefits?

Hypothetical Questions are useful when we want to see if our hunches, our suppositions and our hypotheses have any merit.

Telling Questions lead us (like a smart bomb) right to the target. They are built with such precision that they provide sorting and sifting during the gathering or discovery process. They focus the investigation so that we gather only the very specific evidence and information we require, only those facts which "cast light upon" or illuminate the main question at hand.

In schools which give students e-mail accounts, what is the rate of suspension for abusing the privilege? In schools which give students e-mail accounts, what percentage of students lose their privilege during each of the first ten months? second ten months?

The better the list of telling questions generated by the researcher, the more efficient and pointed the subsequent searching and gathering process. A search strategy may be profoundly shifted by the development of telling questions.

As you can see below . . . students trying to rank the relative safety of ten cities in the Heartland will have greater success with their search if they translate their general question about crime (Which city is safest?) into a **Telling Question** (What is the violent crime rate for cities in New England as reported by the Federal Bureau of Justice and how has it changed over the past ten years?).

This would tend to be true whether they were searching on the free Internet or using an electronic encyclopedia or a pay-for-service collection of new articles. The addition of precise elements to a search can radically reduce wasteful wandering.

Search for General Question crime **AND** cities **AND** "Midwest"

Search for Telling Question "violent crime rate" **AND** cities **AND** "Midwest" **AND** "Federal Bureau of Justice"

Planning Questions lift us above the action of the moment and require that we think about how we will structure our search, where we will look and what resources we might use such as **time** and **information**. If we were sailing West on a square masted ship, we would pass off the wheel and the lines to team-mates in order to climb to the "crow's nest" - a lofty perch from which we could look "over the horizon."

Too many researchers, be they student or adult, make the mistake of burying their noses in their studies and their sources. They have trouble seeing the forest, so close do they stand to the pine needles. They are easily lost in a thicket of possibilities.

The effective researcher develops a plan of action in response to **Planning Questions** like these:

Sources

- Who has done the best work on this subject?
- Which group may have gathered the best information?
- Which medium (Internet, CD-ROM, electronic periodical collection, scholarly book, etc.) is likely to provide the most reliable and relevant information with optimal efficiency?
- Which search tool or index will speed the discovery process?

Sequence

- What are all of the tasks which need completing in order to generate a credible product which offers fresh thought backed by solid evidence and sound thinking?
- What is the best way to organize these tasks over time? How much time is available? Which tasks come first, and then . . . ?
- Which tasks depend upon others or cannot be completed until others are finished?

Pacing

- How much time is available for this project?
- How long does it take to complete each of the tasks required?
- How much time can be applied to each task?
- Do some tasks require more care and attention than others?
- Can some tasks be rushed?
- Is it possible to complete the project in the time available?
- How should the plan be changed to match the time resources?

Organizing Questions make it possible to structure our findings into categories which will allow us to construct meaning. Without these structures we suffer from **hodge podge** and **mish mash** - information collections akin to trash heaps and landfills, large in mass, lacking in meaning. The less structure we create in the beginning, the harder it becomes later to find patterns and relationships in the fragments or the collection of bits and pieces.

If we are trying to compare and contrast three cities (or three products or three bills or three artists) we might use our criteria and our telling questions as the basis for the fields and the entries in our database. Or we may develop a word processing file around these criteria and questions which becomes the collecting mechanism for our findings.

Each time we come upon valuable findings, we extract the relevant data and place them where they belong. If we find facts about the violent crime rate in Hartford, for example, we enter them along with their source as a record in the database which might look something like this . . .

Cities Database

Source

Money Online: Best Places: Money ranks the 300 biggest places - URL:
<http://www.pathfinder.com/@@iFqq1wUAqSqkqVmZ/money/best-cities-96/monlist.htm>

Subject Portland Crime

Keywords violent crime rate

Abstract

270.5 per 100,000 people vs. 716 National average

Our challenge is teaching students to paraphrase, condense and then place their findings thoughtfully rather than cutting and pasting huge blocks of text which have been unread, undigested and undistilled.

Probing Questions take us below the surface to the "heart of the matter." They operate somewhat like the archeologist's tools - the brushes which clear away the surface dust and the knives which cut through the accumulated grime and debris to reveal the outlines and ridges of some treasure. Another appropriate metaphor might be exploratory surgery. The good doctor spends little time on the surface, knowing full well that the vital organs reside at a deeper level.

We never stop investigating. We are never satisfied that we know enough to get by. Every question we answer leads on to another question. This has become the greatest survival trick of our species.

Desmond Morris, *The Naked Ape*, ch. 5 (1967).

The search for insight involves some of the same exploratory elements. In an earlier issue of *From Now On* ([January, 1997](#)), I wrote at some length about the search for "convergence" which guides oil prospecting. The geologist knows that the odds of finding oil are greatly increased when three or four elements are all present in the same location.

When it comes to information-seeking, the convergence is established by creating a logical intersection of search words and key concepts, the combination of which is most likely to identify relevant sites and articles. **Probing Questions** allow us to push search strategies well beyond the broad topical search to something far more pointed and powerful.

And when we first encounter an information "site," we rarely find the treasures lying out in

the open within easy reach. We may need to "feel for the vein" much as the lab technician tests before drawing blood. This "feeling" is part **logic**, part **prior knowledge**, part **intuition** and part **trial-and-error**.

Logic - We check to see if there is any structure to the way the information is organized and displayed, if there are any sign posts or clues pointing to where the best information resides. We assume the author had some plan or design to guide placement of information and we try to identify its outlines.

Prior Knowledge - We apply what we have seen and known in the past to guide our search. We consider information about the topic and prior experience with information sites. This prior knowledge helps us to avoid dead ends and blind alleys. It helps us to make wise choices when browsing through lists of "hits." Prior knowledge also makes it easier to interpret new findings, to place them into a context and distinguish between "fool's gold" and the real thing.

Intuition - We explore our hunches, follow our instincts, look for patterns and connections, and make those leaps our minds can manage. Especially when we are hoping to create new knowledge and carve out new insights, this non-rational, non-logical form of information harvesting is critically important.

Trial-and-Error - Sometimes, nothing works better than plain old "mucking about." Push here. Tug there. Try this out! We find a site with so much information and so little structure that we have little choice but to plunge in and see what we can find.

Sorting & Sifting Questions enable us to manage Info-Glut and Info-Garbage - the hundreds of hits and pages and files which often rise to the surface when we conduct a search - culling and keeping only the information which is pertinent and useful.

Relevancy is the primary criterion employed to determine which pieces of information are saved and which are tossed overboard. We create a "net" of questions which allows all but the most important information to slide away. We then place the good information with the questions it illuminates.

- Which parts of this data are worth keeping?
- Will this information shed light on any of my questions?"
- Is this information reliable?
- How much of this information do I need to place in my database?
- How can I summarize the best information and ideas?
- Are there any especially good quotations to paste in the abstract field?

Clarification Questions convert fog and smog into meaning. A collection of facts and opinions does not always make sense by itself.

Hits do not equal TRUTH. A mountain of information may do more to block understanding than promote it. Defining words and concepts is central to this clarification process.

- What do they mean by "violent crime rate?" Do they use the same definition and standards as the FBI?
- What do they mean by "declining rate of increase?"
- How did they gather their data? Was it a reliable and valid process?
- Do they show the data and evidence they claim to have in support of their

conclusions? Was is substantial enough to justify their conclusions?

- Did they gather evidence and data?
- Examining the coherence and logic of an argument, an article, an essay, an editorial or a presentation is fundamental.

- How did they develop the case they are presenting?
- What is the sequence of ideas and how do they relate one to another?
- Do the ideas logically follow one from the other?
- Determining the underlying assumptions is vital.
- How did they get to this point?
- Are there any questionable assumptions below the surface or at the foundation of the argument?

Clever people seem not to feel the natural pleasure of bewilderment, and are always answering questions when the chief relish of a life is to go on asking them.

Frank Moore Colby, *The Colby Essays*, vol. 1, "Simple Simon" (1926).

Strategic Questions focus on **Ways to Make Meaning**. The researcher must switch from tool to tool and strategy to strategy while passing through unfamiliar territory. Close associated with the Planning Questions formulated early on in this process, **Strategic Questions** arise during the actual hunting, gathering, inferring, synthesizing and ongoing questioning process.

- What do I do next?
- How can I best approach this next step?, this next challenge? this next frustration? What thinking tool is most apt to help me here?
- What have I done when I've been here before?
- What worked or didn't work?
- What have others tried before me?
- What type of question would help me most with this task?
- How do I need to change my research plan?

Elaborating Questions extend and stretch the import of what we are finding. They take the explicit and see where it might lead. They also help us to plum below surface to implicit (unstated) meanings.

- What does this mean?
- What might it mean if certain conditions and circumstances changed?
- How could I take this farther? What is the logical next step? What is missing? What needs to be filled in?
- Reading between the lines, what does this REALLY mean? •What are the implied or suggested meanings?

Unanswerable Questions are the ultimate challenge.

They serve like boundary stones, helping us to tell us when we have pushed insight to its outer limits. When exploring **essential questions** (most of which are **unanswerable** in the ultimate sense) we may have to settle for "casting light" upon them. When wrestling with these **Unanswerable Questions** we may never find Truth, but we may illuminate . . . extend the level of understanding and reduce the intensity of the darkness.

The real questions are the ones that obtrude upon your consciousness whether you like it or not, the ones that make your mind start vibrating like a jackhammer, the ones that you "come to terms with" only to discover that they are still there. The real questions refuse to be placated. They barge into your life at the times when it seems most important for them to stay away. They are the questions asked most frequently and answered most inadequately, the ones that reveal their true natures slowly, reluctantly, most often against your will.

Ingrid Bengis, *Combat in the Erogenous Zone*, "Man-Hating" (1973).

- How will I be remembered?
- How much can anyone resist Fate's will?
- What is the Good Life?
- What is friendship?
- How would life be different if . . .

Students wrestling with **Essential Questions** must be prepared for the strong likelihood that their questions may be **Unanswerable**. They must be taught that this reality is perfectly acceptable and is no signal to stop searching and thinking.

Inventive Questions turn our findings inside out and upside down. They distort, modify, adjust, rearrange, alter, twist and turn the bits and pieces we have picked up along the way until we can shout "Aha!" and proclaim the discovery of something brand new.

- How do I make sense of these bits and bytes and pieces?
- What does all this information really mean?
- How can I rearrange what I have gathered so that some picture or new insight emerges? What needs to be eliminated or reversed or modified in order to make better sense of my findings?
- What is still missing?
- Can any information be regrouped or combined in ways which help meaning to emerge? Can I display this information or data in a way which will cast more light on my essential question?

Provocative Questions are meant to push, to challenge and to throw conventional wisdom off balance. They give free rein to doubt, disbelief and skepticism.

The best servants of the people, like the best valets, must whisper unpleasant truths in the master's ear. It is the court fool, not the foolish courtier, whom the king can least afford to lose.

Walter Lippmann, *A Preface to Politics*, ch. 6 (1914).

Ancient empires and kingdoms in China often employed a court jester or fool whose job it was to challenge and make fun of policies and ideas and key players surrounding the king or queen. The fool could often get away with a level of questioning which would never have been permitted a "legitimate" member of the council. On the other hand, ([as is pointed out in this extensive online article about jesters](#)) the fool might also lose his

head if the king or queen took offense. A dangerous occupation!

Closely associated with **Divergent Questions** and **Irreverent Questions**, **Provocative Questions** help provide the basis for satire, parody, and expose whether it be *Gulliver's Travels*, *Alice in Wonderland*, *DILBERT* or Seymour Hersh's recently released *The Dark Side of Camelot*. These plays and stories poke fun at politicians and leaders in ways which help protect us from excessive deference or what is fondly called "spin" today.

(Visit this [Web page](#) for an extensive bibliography on satire and parody.)

In the case of student research, we have probably devoted too little attention to irony, satire and parody as an important element in "open systems," a term which describes responsive (and healthy) political systems as well as organizations of various kinds such as schools and corporations.

When inspired by a desire to understand the Truth, **Provocative Questions** play a positive role in debunking propaganda, mythologies, hype, bandwagons and the Big Lie. They help us to remove the "bunk" or "claptrap" and determine if there is any substance worth considering. In a time of what Toffler calls "info-tactics" such questions become an essential tool for any citizen in a democratic society.

In an age of info-glut and info-garbage, we must equip students with questions which enable them to separate out meaning from all the competing variants of BLATHER (quoted here from Roget's Thesaurus). . .

empty talk, idle speeches, sweet nothings, endearments, wind, gas, hot air, vapping, verbiage, DIFFUSENESS

rant, ranting and raving, bombast, fustian, rodomontade, BOASTING

blether, blather, blah-blah-blah, flimflam

guff, hogwash, eyewash, claptrap, poppycock, FABLE

humbug, FALSEHOOD

malarkey, hokum, bunkum, bunk, baloney, hooey

flummery, blarney, FLATTERY

sales talk, patter, sales patter, spiel

talk, chatter, prattle, prating, yammering, babble, gabble, jabber, jibber jabber, jaw, yackety-yak, yak yak, rhubarb, CHATTER

- Where's the beef? content? substance? logic? evidence?
- What is the source? Is the source reliable?
- What's the point? Is there a point?
- Cutting past the noise and the rhetoric, is there any insight, knowledge or worthwhile information here?

Irrelevant Questions take us far afield, distract us and threaten to divert us from the task at hand. And that is their beauty!

Truth almost never appears where we might look logically. The creation of new knowledge almost always requires some wandering off course. The more we cling to coastline, the less apt we are to find the New World. As Melville so dramatically pointed out in **Moby Dick**, the search for Truth requires the courage to venture out and away from the familiar and the known . . .

But as in landlessness alone resides the highest truth, shoreless, indefinite as God --so, better is it to perish in that howling infinite, than be ingloriously dashed upon the lee, even if that were safety! ([click for full text of this selection](#))

Divergent Questions use existing knowledge as a base from which to "kick off" like a swimmer making a turn. They move more logically from the core of conventional knowledge and experience than **irrelevant questions**. They are more carefully planned to explore territory which is adjacent to that which is known or understood.

Trying to find a way to restore water quality in a lake or stream? If we limit our search to successful attempts, we may miss out on the chance to avoid other people's mistakes. Sometimes we learn more by studying the opposite of our main target.

In the same sense, we may want to check out efforts to restore air quality and other tangentially related efforts. We may even explore efforts to re-introduce endangered species to various habitats. New ideas are rarely sitting waiting for us in obvious places.

The ability to freely associate related topics and questions greatly increases the odds that researchers will make important discoveries.

Irreverent Questions explore territory which is "off-limits" or taboo. They challenge far more than conventional wisdom. They hold no respect for authority or institutions or myths. They leap over, under or through walls and rules and regulations.

Socrates found himself in considerable trouble for showing the youth of Athens how to ask **Irreverent Questions**, and we need to remember that such questions are not universally appreciated. In fact, some folks find such questioning disrespectful and impolite. They question the value of **Irreverent Questions**.

It is the human condition to question one god after another, one appearance after another, or better, one apparition after another, always pursuing the truth of the imagination, which is not the same as the truth of appearance.

Alain [Émile-Auguste Chartier], *The Gods*

Corporations like IBM have learned that today's heretic - the one with the courage, the tenacity and the brash conviction to question the way things are "spoed to be" - often turns out to be a prophet of sorts. The **Emperor's New Clothes** is the classic story showing what happens when **Irreverent Questions** are discouraged and obedience, subservience and compliance are prized. The emperor parades naked. The corporation clings blindly to old beliefs.

What some staff have said about the practicum....

"I now think more deeply about what I am teaching and how I teach. I naturally think of using ICT's in my planning and look for opportunities to integrate them into all areas."

"Previous to the course it (ICT) was hardly used at all- the odd bit of word processing. I was not confident on it and did not feel confident enough to use it...."

"A development in knowledge, reinforcement of skills. It's been good to have the opportunity to reflect on best practice and pick up on good ideas."

