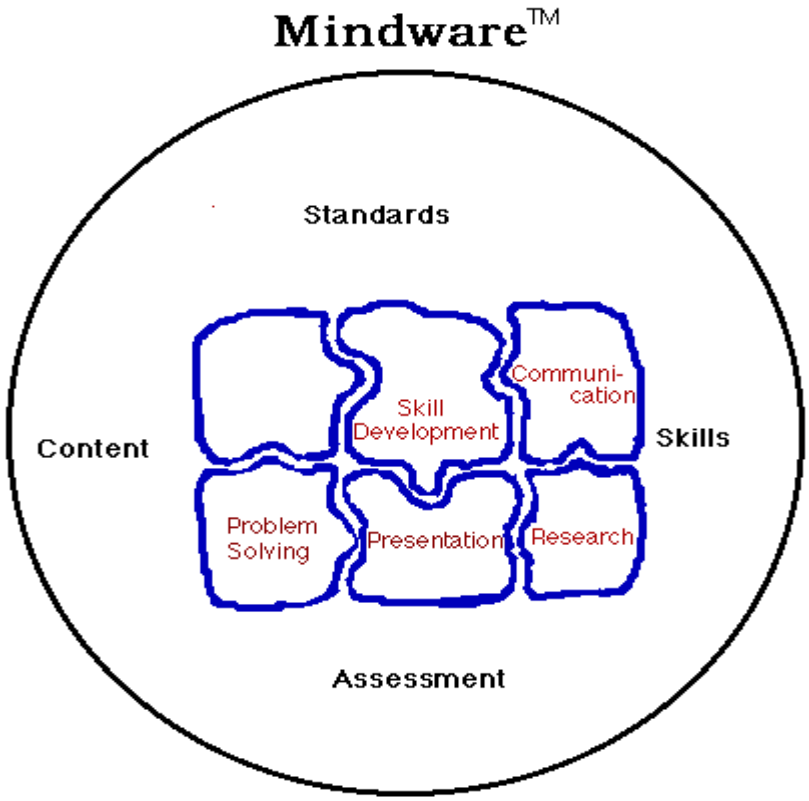
Thinking Over Technology: Mindware for Meeting the Standards



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Mindware

Technology for the Mind-Full

Mindware is how the human mind uses technology.

We can make the most of technology only when we think about what it can do for us, not what we must do for it. We need to use technology for research, problem solving, skill-building, communicating and presenting our ideas. With these goals "in mind," our mind's eye guides us to make technology an extension of ourselves, not unwieldy tools we must constantly bend to our purposes.

Mindware is designed by "users."

Thinkers who use technology to accomplish goals develop their minds in conjunction with what technology has to offer. Like software and hardware, mindware has to be developed and installed, learned and used. It has to be upgraded. It becomes shareware when we make our thinking visible through systematic reflection. When we develop the habit of cycling through acting and then reflecting out loud, we become eligible for an "insight" license as a community of practice.

Mindware adds the human advantage - imagination.

Machines can't dream. Technology tools are exactly what we envision them to be - nothing more, nothing less. The challenge is to hone our instincts with a critical eye for the technology tools which will accomplish our purposes. Charting a course in an ocean of benefits and features makes for smoother sailing. Clear intent and flexible skill sets allow us to adjust our course to take advantage of favorable winds, and still make landfall.

Mindware bears teaching.

As educators, a critical eye pays off when we teach our students to focus their efforts thoughtfully when they use technology. Whether they are building skills, doing research, problem solving or presenting their ideas, technology will serve them with the power to access information and people, intensify and accelerate their own thinking and connect them with other minds as windows and mirrors on their worlds.

Mindware runs on feedback.

Built on a platform of acting and reflecting, mindware makes waves and then rides them to the beach. It's a virtual wave machine, powered by ideas. Each idea feeds the next and experimentation yields results and more and more questions to be answered.

Minds need technology to run mindware.

With vast resources and the ability to shape and reshape ideas in constant, "timeless" connections, digital breeds digital. To live (and love) the digital tools for thinking, we must

give up the static form of what results. "The Word" lives today, but may be edited tomorrow. Like our earliest oral traditions, "the word" is for the telling and the hearing, and the kernels of truth run through it. It lives in the bits.

Mindware is based on clear vision, transparent criteria and focused energy.

The student is at the center of this picture, driven by curiosity - the need to know and the hard wiring to find out. When curriculum and instruction build on the curiosity of students they capture and multiply their energy. Mind"full" education minds the store of energy - feeding it with respect and wisdom. Part of the wisdom is in making sense of the opportunity technology represents.

Mindwear: Wear your technology on your mind

Patterns. It's all in the patterns. The proliferation of everything in our time - information, ideas, people, opportunities, tools - means we have to look for the patterns. What are the trends, the continuities, the fractals? How do the systems reflect each other, mirror each other and extend each other.

Recipe for Continuous Mindware Development:

1. Plan your work and work your plan

2. Focus, focus, focus

3. Know what you know

4. Know how to find out what you don't know

5. Make time to show yourself what you know

ACT-REFLECT-ACT-REFLECT-ACT-REFLECT-ACT-REFLECT-ACT-REFLECT

Mindware: The Mind and the Machine

Think of Mindware as consisting of genres, like literature, only categories of thinking. These thinking genres wear well on your mind as a tool for staying focused and refreshed in a sea of options. They allow you to set goals in the five areas of: research, problem solving, skill development, communication and presentation.

Genre	Goal	Mindset
Research	Use a question to create personal meaning from what others know	How can I find out?
Problem Solving	Define and address a puzzle, dilemma, paradox or challenge	How can I figure something out?
Skill Development	Improve against a standard	How do I get better?
Communication	Finding threads, similarities and ways to collaborate further	How can I connect with other people and their ideas?
Presentation	Present a personal perspective, insight or idea, or demonstrate accomplishment of a goal, standard or objective.	How do I show and share what I know and can do?

Genre	Results	Forms
Research	"I can ask questions, I can find out!"	Hypertext reports; multimedia presentations; digital portfolios
Problem Solving	"I can figure things out. I know a problem when I see one. I can solve problems."	Simulations; Problem-based learning: Authentic tasks
Skill Development	"I can get better. I am a learner. I can build my skills."	Writing, computing, concept mapping, drawing, building
Communication	"I can connect with other people and their ideas to learn and create."	Letter-writing; conversation; monologues; dialogues; progressive stories and requests for assistance or help; email, newsgroups, threaded discussions, mail to and reply forms
Presentation	"I can contribute. I know things what matters to others."	Personal narratives, exhibitions, first hand accounts; web pages, digital portfolios

Genre	Teaching	Learning	Management
Research	Invite questions; provide rethinking challenges; set criteria for rigorous thinking; publish results	Ask questions; survey what is known; make sense of it; present personal ideas in the context of what is known	Group investigations (CSILE); Jigsaw research; Research centers for different topics or with different resources on the same topic
		Understand problem;	Parallel problem solving groups;

Problem Solving	Provide scenario; set criteria for success; manage flow of action and reflection	adopt a role; engage in action and reflection on results; communicate about the process and results	Group investigations; Jigsaw study groups; Centers-the problem, research, writing, presenting
Skill Development	Overview software; set goal; track progress	Agree on goal; make goal-directed decisions; reflect on progress	Set up centers with different or complementary skills Use portfolio strategy to help students take responsibility for working independently Group students (3) to do an activity (roles = task reader, discussion leader, summarizer)
Communication	Create projects within and between classrooms which invite participation	Invite feedback and give it; make connections and sustain them; reach out to new people through common ideas and interest	Special interest groups, service clubs, religions, clubs
Presentation	Set clear expectations, problems, and projects; provide time for reflection, discussion, and time for presentation to an authentic audience.	Collect Select Reflect Present	Set up stations for: - creation of artifacts (video, sound, photos); - holding collections (portfolio folders - physical or electronic; - presentation (practice area, video for replay, table for peer review)

Research: What can I find out?

Mystery, intrigue, slew-footed detectives and clueless stand-ins. These are the things that define real life research. Technology provides tools which help us to access information (databases), search for specific "clues" (search engines) and organize and shape what we find (spreadsheets, tables, graphs and word processors). They allow us to zoom in or stand back to find the Gestalt (Internet searches). They connect us with other people who are looking for the

same needles, but in different haystacks (listservs, domain experts). The results - students can say, "I can ask questions, I can find out!"

Problem Solving: What can I figure out?

Thesis papers come to mind. Persuasive essays are built on insights the author wants to share and multiply. We ask, "What is the challenge, dilemma or situation? What is the argument and evidence to support my hypothesis? Technology provides support for this thinking with databases to collect and analyze information, simulations to practice our skills, and word processors to develop our ideas. Telecommunications lets us solve problems with people across the planet and set out experts to help. The result - students can say, "I can figure things out. I know a problem when I see one. I can solve problems."

Skill Development: What can I do better?

This is a like comparative essay. What skills are required? What skills do I have? What's the difference? Skill development packages guide students in identifying what they can do and coaching them in new skills. Tools for working out ideas, like word processors, databases and spreadsheets allow students to learn what they know and don't know how to do by doing. Asking questions of established databases at the desktop, district or global level shows what can be done and helps students to stretch. The results - students can say, "I can get better. I am a learner. I can build my skills."

Communication: How can I connect with other people and their ideas?

We know the communication forms we use now: letter-writing; conversation; monologues; dialogues; progressive stories and requests for assistance or help. These forms find themselves in organizations too - special interest groups, service clubs, religions, clubs - where the connections come from shared interests. The goal is finding threads, similarities and ways to collaborate further. All this happens in the technology assisted environment online with tools for email, newsgroups, threaded discussions, mail to and reply forms. Students need to know how to invite feedback and give it, to make connections and sustain them and to reach out to new people through their ideas and interests. The results - students can say, "I can connect with other people and their ideas to learn and create."

Presentation: How do I show and share what I know and can do?

Personal narratives, exhibitions and first hand accounts all capture perspective, skills and knowledge at a point in time, but web pages can be updated and digital portfolios are forever. With desktop publishing and hypermedia students think about an audience and show what

they know for others to appreciate and learn. Even email creates an audience and the name of the game is contribution. The results - students can say, "I can contribute. I know things what matters to others."

How to Make Mindware Work for You

Use your bird's eye view of technology in use in education to use technology effectively across grade levels and disciplines. For example:

Developing a technology plan

"Technology will be used by our students for research, problem solving,skill development and presentation. . . "

For making purchases

"We require hardware which will support students of all ages in doing research, problem solving, developing their skills and presenting their ideas to others . . . "

For evaluating software

"We will buy software which teachers identify as mindware tools for research, problem solving,skill development and presentation. . .

For evaluating technology use

"We want to know the most effective mindware strategies you use and the hardware, software and instruction which support them. . . "

For curriculum development

"What mindware have your students used most effectively? How does that prepare them for growth in a skill or content area?"

For instruction

"Students work independently or in pairs to develop reading, writing and computing skills. In small groups, they do research and solve problems. Then they present their ideas and solutions to the whole group. . ."

For developing students self-directed learning skills

"Our challenge is to develop your mental habits for using technology to develop your skills, do research, solve problems and present your ideas so that you can use them anytime,

anywhere you need them."

Understand the mindware you use as a team and use a common language to learn from each other.

Archive your questions, doubts, concerns and success stories.

Build collective wisdom around a simple structure like this one and your learning will accelerate by leaps and bounds!

Questions for Reflection by Students

Research

What are the enduring ideas and questions in each discipline?

What ideas can be confirmed both within the discipline and by other disciplines?

What was going on in different disciplines in one particular time period? How do they all connect?

Problem Solving

What are the unsolved problems we face today?

Who are the problems solvers in our society?

How do you become a problems solver and earn a living at it?

Skill Development

What skills are valued in our society?

What skills do I have that are typical for my age level? atypical?

What skills do I want to have? How do I develop them?

Presentation

What is the value of sharing ideas with others?

How do you determine who is interested in your ideas?

How do you present your ideas so they are understood by others?

How do you present your ideas to engage others?

Technology Resources for Thinking

Digital portfolio (http://home.aisr.brown.edu)

EdWeb is a great location for learning about educational issues. http://cnidr.org:90/

Exhibitions from the Coalition of Essential Schools are good for learning about the connections among ideas, activities and systematic reflection and presentation by students. Box 1969, Brown University, Providence, RI 02912. (http://home.aisr.brown.edu)

Grady Profile (800-77GRADY) http://www.aurbach.com

HyperCard (http://ed.info.apple.com/education/)

HyperStudio from Roger Wagner Publishing, http://www.hyperstudio.com (800 HyperStudio)
HyperStudio Electronic Portfolio (609-466-1085)

Inspiration for mapping your ideas as a group (Houghton Mifflin, through catalogs such as MacWarehouse (800-255-6227) Both platforms available.

Instructional Management Series from Campus America for a complete management tool to develop curriculum and manage it over a network. (423-523-9506)

Knowledge Forum for students to communicate with each other

Media Fusion for student research projects (800-SOS-APPL or (http://ed.info.apple.com/education/)

Persona Plus from Imageworks Corporation for a complete management tool and a way to communicate performance tasks to students over a network. (800-340-6499)

Scholastic's Electronic Portfolio (800-541-5513) http://www.scholastic.com

Tom Snyder's simulations (http:www.teachtsp.com/ 800-342-0236)

Wiggle Works by Scholastic (http://scholastic.com/index.htm), or Writer's Solution by Prentice-Hall.

Check out **Jefferson Smith's** approach to transforming his classroom with technology.
http://www.kde.state.ky.us/caa/biat.intro.html

Internet projects (http://infoserver.etl.vt.edu/~/laughon/)

Kidlink http://www.kidlink.org/

Kidsphere
listserv@vms.cis.pitt.edu

Global Classroom List
listserv@uriacc.uri.edu

International Email Classroom Connection
http://www.stolaf.edu/network/iecc/index.html

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