

Developing an Instructional Model for Effective Technology Usage

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The goals of this workshop

- To help you move schools from where they are to where they need to be
- To help you develop a new vision for technology
- To help you understand what technological integration could be

Where am I going with this presentation?

Looking at the Philosophy of Technological Integration

- background
- old mindsets
- new definitions
- new directions

The philosophy of technological integration

- in the beginning, long ago and far away learning to use (& teach with) computers was done by magic, osmosis & proximal adoption - we put teachers and students next to the technology and hoped by osmosis that they would connect with it - some did - most didn't - the traditional implementation model was (and primarily remains) READY, FIRE, AIM

What was early computer literacy?

- programming - drill & kill - skills-based software where skills were taught in isolation - a focus on cards, cables, hardware, software - what we now call technodrool - a veal calf approach to learning - all of this was indicative of the immature stage of usage

Entertainment and edutainment

- we used reinforcement software to reinforce addition skills that asked you to solve a number of questions - if you did well, a barnyard animals would appear, doing cartwheels across the screen - a reward that had little if any relevance to the problems solved - this is gratuitous entertainment without engagement- a pathetic attempt to maintain interest in a meaningless task

What's so wrong with using it like that?

- Absolutely nothing!!! - using it in that manner is completely understandable in beginning because we were making things up as we went - this is what's known as creative floundering - a process we went through as we were trying to develop educational context and at the same time to justify it - as a result, much of the early software for early learning which

What we've learned since then is that

- integrating new concepts & technologies is not a naturally occurring process - rather it is a deliberate & planned intervention - so then, what *is* computer literacy?
- technology is a vehicle not a subject - it's a tool of personal empowerment - a tool for teaching in context - a tool for learning about subjects and processes where learning about technology is an incidental but essential by-product - learning how to appropriately use technology is like learning a 2nd language to increase fluency & insight - it gives you access to new world by helping you develop the ability to access information, then manipulate & apply it to specific real time circumstances & situations - in essence, the same opportunity that workers in offices have - that is, to make changes without pain

But why is technological literacy such a big deal?

- because the world has fundamentally changed - students must feel comfortable with the tools of Communication Age - they must be proficient at accessing, evaluating, applying & communicating information - they must be globally aware, & able to use resources that exist outside the school or community

So how should we introduce technology to students?

- we must introduce computers as a learning tool, not magic - providing a different context of real-life problems where learning is not atomized - it's a tool to learn new content in broader, world wide context - for simulations & problem solving - allowing students to blow up garages, dissect frogs, apply variables to experiments & see what happens - to play with what ifs - to do this, we must match the technological activities with the specific needs of the children and provide them with experiences that have personal relevance - technology must be used as a creativity tool of personal empowerment rather than as a novelty and time filler - something that is complementary not supplementary in use
- to do this, we must model its use as a research tool - how to use technologies to organize & apply information - as a 21st C. communication tool - as an absolute prerequisite to survival in the world of tomorrow
- it must be viewed as just another learning station - no different than manipulatives, books, or VCR - just because not being used all time doesn't mean something is wrong - it's just one of the many things in our instructional bag of tricks that is used when it's appropriate - in the same way that a plumber only uses a pipe wrench when it's the most appropriate tool - as such, it's not about "doing" computers but "using" computers

What is integration?

- according to Webster, it's the planned & purposeful intertwining of subject areas done to achieve multiple goals - it's not just about filling a new medium with old content - it's all about moving people from computing to transparent application

philosophical or conceptual infrastructure created to apply technology effectively - integrated learning is not just a matter of 10:00 to 10:45 - it's a place where we challenge children's minds, not their patience

- learning by rote, unrelated subjects & segmented curriculum are reflection of Industrial Age that no longer exists - consequently a curriculum that doesn't acknowledge potential of technology isn't just good or bad, it's irrelevant

What we need to understand about the notion of integration

- nothing much has changed, you're just using different tools that allow you to teach not only differently, but to teach different things that you are unable to teach without technology - as such, integration is a conceptual mindset, not a major physical change required - we need to view technology as just another empowering tool, an improvisation, an innovation - it's only when you get beyond technolust & start to look at the bigger picture that you can you move on to what's really important - this involved moving from matter to mindset - from computers to curriculum - from peripherals to problem solving from processors to processes - from hardware to headware - and this_all begins with a transparent vision for the use of technology

What is the technological classroom

- a move from pondering pen to processing problem - from technology as subject to technology as vehicle to empower us - it's just an agent to extend the thought processes - an agent to think, solve problems, apply variable solutions to same problem to bring the outside to classroom & vice versa - to create learning environments to fulfill the current and future needs of all

From the Information Technology Association of America

A report (by this organization) warns that two out of every 10 jobs requiring information technology skills is going unfilled due to a shortage of qualified workers."

(Chronicle of Higher Education 03/07/99)

From Richard Riley, former Secretary, U.S. Dept. of Education

By the Year 2005, 60% of the new jobs will require a level of technological fluency currently held by only 20% of our current workers. The top ten jobs that will exist in the year 2010 do not exist today. We are preparing our students for jobs that don't exist, using technologies that haven't yet been invented, to solve problems that we haven't even considered yet.

(@ KETC 03/07/99)

What's the message here?

- Our world has fundamentally changed - it's no longer about change today and status quo tomorrow - rather it's about constant relentless change - change today change tomorrow

of new technologies has lead overnight to a new definition of intelligence - a new definition of the skills, knowledge, attributes and behaviors that are needed in our new world.

Today's workplace

- is a very different place than the workplace of the past - how can you go back to the basics of a world that no longer exists - the bottom line is that the workplace doesn't linger on the past in matters of employment skills - rather what's needed is a completely new set of skills - skills different than those that were needed to be successful in the past - this is because we are preparing them to work in their future, not our past - so consider for a moment - will there be more or less technology in that world?

Tomorrow's workplace

- the attributes of tomorrow's worker include flexible, adaptable problem solvers with the ability to work in teams - people who have communication, personal management & lifelong learning skills - who are informationally and technologically fluent not just literate - as Jennifer James suggest, using technology is now the mark of an educated person.

So what do students need?

- they need more than basic computer survival skills - they need a basic understanding about technology within the context of curriculum/task - they must be able to access, process & organize information within the context of real time, real world tasks. Integrated computer fluency should be the goal, with an emphasis on the transparency of the tools, the tasks & the thinking processes. To get there, we must address some longstanding myths about the use of technology in the learning process.

Myth No. 1: Technology is a Subject

- during the early years of our lives, we developed our own personal intellectual toolbox through our educational & life experiences - we added to the toolbox through our college experiences and then added more to it with our "real world" adult experiences - technology is just one of tools in our intellectual toolbox - just a single arrow in a quiver of instructional and personal strategies that we use - as such, technology is not the focus, it's just one of many catalysts.

Myth No. 2: Technology Must be Used All Day, Everyday

- when I worked as a director of technology, I once took the superintendent of schools on a visit to several school sites to look at how technology was being used in those schools. In one particular school (I know that this was an exception....NOT!!!!) we walked into a lab where there was nothing but blank screens (or what Jamie McKenzie calls "savesaver disease" - the superintendent immediately started into a tirade, telling me that if the equipment wasn't being used it should be removed from the school - I took him by the hand

spoken by someone who clearly doesn't teach - does a carpenter use every tool every day? A good teacher uses a variety of tools to reach their students and only uses a tool when it's most appropriate, not just for the sake of using it.

Myth No. 3: Learning Skills Happens Only in Context or Isolation

- "learn it only in context" is a recent buzz word - and it sounds great - in theory...but how did you first teach a child to print - you first had to show them how to hold the pencil - and then when they felt comfortable with the pen you quickly moved on to showing them how to use the pen to form the letters - how do you get kids to use KidPix to draw images related to the area of study you are working on - you first show them how to use the mouse and then use it to create the images - you teach the basic skills first, and then try to apply them in context.

Myth No. 4: "Technological Integration"

- Technological integration is education's latest buzz phrase - the phrase often appears in statements/goals made by administrators & trustees - the problem is that anyone who has worked on a project to integrate Language Arts, Mathematics, Social Studies and Art together knows that it takes a great deal of work - and it gives them a severe case of the heebie jeebies when they think about doing something like this with computers - a more "realistic" definition of "technological integration" is where the use of technology is interwoven into learning - a dependent variable where the learning of the technology is not the focus, but an incidental (and essential) by-product of the learning process.

There are two approaches to change

1. As Bernajean Porter points out in "Grappling With Accountability" (ETP, 1999), there are two approaches to change - first, there is incremental change where we run pilots running parallel to system - as long as it doesn't bother rest of system there's tolerance - at the same time, there is no expectation of a need to make significant systemic change - typically, pilots are lead by a small committee that works together for a short period of time and then disband - this is an attractive model because it allows you to decide down road if it should apply to the entire system. In reality, each year you develop a new set of pilots and consequently, whatever doesn't get funding doesn't move ahead
- Systemic change is for everybody, but the challenges are very different and greater - system change is just that, moving to bring about change to the entire system - in reality, change doesn't take long, it's making the decision to change that takes all of the time - this is because very little is possible until we want to change - and even then, we have only a limited time frame in which to bring about change - like Jell-O, once it has been heated and mixed, you set it in a mold you only have a limited amount of time to set things up - and once it's set, it's pretty much set for good. Anyone who has moved from an old school building to a new school building understands that if you do not move quickly to transform the culture, you're pretty much assured of getting the old school inside the new building

else" - we have to decide in advance where it is that we're heading and how it is that we're going to assure that we are on track. The critical questions

- how can technology be used to enhance learning?
- how can we infuse technology into both our curriculum & instructional philosophies
- how do we integrate universally - not just in specific subjects
- how do we develop a holistic plan that provides equity of access & experience

Let's talk about relevant curriculum

What happens "out there"?

- outside education, technology is seen as a tool - a means to an end - a vehicle to make individuals more productive - something that is seamlessly woven into the fabric of everyday life - that is not used unless there's a reason to use it

What happens in education?

- Typically, we see decontextualized curriculum where technology is seen as an end not a means - it's seen as a separate curriculum - in terms of curriculum development viewed by many as just add-on - by some, it's not even considered when they develop curriculum because this is seen as someone else's job! - this is a classic left hand not understanding the right hand issue - curriculum revision plans are regularly developed separately from technology plans - ed. reformers are often not aware of the technology tools available to be used - tech reformers not aware of new educational initiatives & new pedagogy this requires - this typically leads to irrelevant curriculum where skills are taught in isolation - where labs are devoted to designing cooler report covers rather than structured information gathering - it often results in term papers with fancy typefaces. but where the writing stinks - and just because they're computer literate doesn't mean that they're literate

What do we need to do?

- plan to link new educational curriculum with available technology, which is not the norm for educational reform - to be successful we must make a substantive link between technology & curriculum - technology is simply a tool to help us accomplish curriculum goals more effectively

What are general goals of curriculum that technology needs to support?

The ETP Technological Infusion Learning Spectrum identifies 3 broad categories of technology uses for teaching & learning: Literacy Uses, Integrating Uses and Evolving Uses. What follows is a brief overview from *Grappling With Accountability* by Bernajean Porter - you can find information on the Learning Spectrum at www.edtechplanners.com.

Literacy Uses

At this stage of the continuum, technology is viewed primarily as the object of instruction - we hear technology stories rather than learning stories - the experiences

Typical literacy activities include:

- keyboarding
- computer literacy classes
- "doing computers"
- computer programming
- computer applications

A Computer Literacy Scenario

Johnny goes to the computer lab every Wednesday. He learns word-processing, spreadsheets, and how to create pictures with a paint program. A computer teacher taught him keyboarding last year. He expects to take keyboarding again before the end of the year to be able to type even better. Johnny is also putting together a great slide show on UFO's. Its his first quarter computer project. Johnny would like to use computers more but the lab is usually full with other classes in it. However, Johnny's classroom has a computer this year so when he finishes his "real work," his teacher lets him play "SimCity" or "Math Blaster" or make a crossword puzzle with his vocabulary words. He really likes playing the new "Oregon Trail." Even though they studied the westward movement last year, "Oregon Trail" is still fun and interesting. Johnny has discovered he really likes computers so next year he has signed up for the two new classes, robotics and an html web design.

Integrating Uses

Technology & learning uses are typically initiated by teachers - assignments generally support traditional tasks & assessments as well as traditional teacher & student roles - essentially, the same stories with new tools - viewed as optional & interesting but not necessary to achieve current curriculum goals

Typical integrating activities include:

- drill & practice
- instructional games
- integrated learning systems
- word processing to write themes
- content-related software
- using software to calculate student grades
- using computer as productivity tool

The litmus test you use to determine whether or not you are at the integration level is that if you take the technology away, teachers can still do their job without changing much.

Integrating Uses Scenario

test next month. When their class goes to the library, Akhito and her friend, Safia, research their earth science report together with on-line research tools. Her science teacher made a research "template" on disk and expects it to be completed when the class goes to the writing lab tomorrow. In the computer lab, a special software program prompts them through scientific report questions. Their prompted answers import into a word processor, then a spreadsheet graph of their data collected is inserted in the document, and finally a spelling checker is run before printing out their assignment. Akhito is glad to have these tools to make her schoolwork even better.

Innovative Uses

Technology & learning uses are initiated by students and teachers creating innovative learning tasks that would be impossible without technology - the focus is on developing skills in collaboration, self-directed learning, complex thinking, communications & use of electronic information - technology is used to transform learning culture - if you took the technology away teachers and students would not be able to continue doing what they had previously been able to do.

Typical innovative activities include:

- using technologies as complex learning & thinking tools
- students at different sites using telecommunications to gather, process & report on a common project
- students working together to solve real-world problems using real-world tools
- students having opportunity to demonstrate learning beyond standardized tests through performance based assessments

Innovative Uses Scenario

Jose, Ruby, and Gregory have chosen to design a school project researching a river front development using landfill. They plan to present their findings to the mayor's planning commission at the end of the term. When their civics, science, language arts and math teachers approved their second semester community project and assessment process, they began their collaborative task to research the environmental and economic development issues that would help to formulate a recommendation. They are able to do their work from school, the community library, home, and their local college using laptops with modems to connect to each other and resources as needed. Their research is supported by on-line digitized text and graphic resources. They also use teleconferencing with a network of researchers their teachers joined last year as well as a shared database designed for group resource sharing. With continuous review and guidance by their teachers and some peer technical assistance in preparing their presentation with multimedia tools, they complete their project. When the team finally presented their findings, the planning commission valued and utilized the knowledge created by this student team while deciding the city's zoning issue. The students' findings and successes will be published electronically on an environmental home page on the

Is a mixture of literacy, integration & innovation with the literacy & integration there to support innovation - innovation is not do something, do anything just use it! We try to combine skill building (questioning, planning, thinking, communications, information skills) with electronic tools & information to draw conclusions & make generalizations based on info gathered

The goal

Is NOT technology skills - it's learning for measurable student results with a focus on learning, not just technology - curriculum is the driver, not technology. Learning the technology skills is an incidental but essential by-product of the process.

The goal is communicate using a variety of media & formats to access & exchange information in a variety of ways critical thinking, problem, The goal is relevant curriculum - to use information & then select the appropriate tools to solve problem - to know content & be able to locate additional info as needed in order to become self-directed learners who can collaborate & cooperate in team efforts - interact with others in ethical, honest & appropriate ways

It's about providing basic skills but within a learning context with a focus on HOTS| not just LOTS - with a focus on information processing skills - with a focus on both individual & group skills - with a focus on activities that articulate with adult roles. Active learning is project-based, multi-modal learning that emphasizes construction not instruction where the use of technology is complementary not supplementary - this is not just about computer skills taught in isolation but interwoven into curriculum

What would this look like?

What are the mandates of public education? We have two mandates. First we are responsible for the acculturation of the individual. The passing of the accumulated wisdom of nation on. This includes the appreciation of the aesthetic, the esoteric, the philosophical, the ethical & moral - all hopefully leading to good citizenry. Our second mandate, often overlooked, which is equally important to first, is about preparing our students for life after school, of working to learn, learning to work, both earning and learning a living. We want to help them to become productive members of society, able to contribute economically to the nation, while also ensuring their own financial success.

Let's stand back for a moment and consider the present educational reality in the light of our mandate; and then let's consider the possibilities for making the transition from our present way of thinking to the future by projecting what this might mean for education. How do we do this?

The way things are right now- a one-act play.

Have you ever heard this before?

periods to get through all this stuff on Japan. Come on guys - 7 minutes have already gone by. Hand in your homework please. Where's yours Patty? Did you forget it again? Robby, will you please get your hands out of your pockets and take your feet off the desk. Hey Liz, get your stuff out. Maury, where's your notebook? No you can't borrow my pencil. Come on folks, we gotta go. I want you to take notes on the major towns, transport, cost of living & history of the Kansai region of Japan.

The Kansai region has three major cities, Osaka, Kyoto & Kobe. Osaka is the hub city - it has a population of 2,146,000 and it's a port and financial center. I said 2,146,000 Harriet - did you get that? Kobe has a population of 1,875,000 people - Bill - did you write that down? Come on folks, we need to get through all this stuff for the test next Tuesday. Where was I - right, Kobe is a port city - it's the center for ship building in Japan. Kyoto has a population of 1,352,000 - it's particularly known for its cultural heritage - in fact, during WW II it was considered to be so rich in cultural heritage that it wasn't bombed. A high-speed railway connects the 3 cities.

Pardon me? No James, you don't have to write this all down if you don't want, it's really up to you. Yes it counts. Yes you will have to know this for the test? Yes some of it is in the book, but not all of the stuff - Jason would you please settle down - this isn't going to take that long. What do you mean Jason. Yes, of course it's relevant. Now don't argue with me. What do you mean why? Because I said so. Yes, there's a written assignment - read Chapter 3 and do questions 1 - 7 from the end of the chapter. Yes, I will be marking it ... yes of course it's graded & it could be on the final.

Do you recognize this approach?

It's the full frontal lecture model. Does this type of teaching occur in your school? Is its use more common than acknowledged? Are there differences between lower and higher grades?

Why does this happen?

Because it's our native language. It's the way we were taught. Many teachers have invested lives in developing this style of teaching to the point where it has become their comfort zone. Thus, when push comes to shove, they tend to revert to this approach and respond to TTWWADI (That's the Way We've Always Done It) when challenged.

What else drives this?

Parental expectations - the curriculum guide. The sense that we've just gotta cover it. It's all about getting kids to the next class, the next grade, or the next level of education. It's particularly built into the evaluative tools of system and the multiple levels of testing that students face - the test on Monday; the end of unit, end of term, end of year tests; the state and national exams

The major focus is on content - on the explicit curriculum - much of it, when we look at it honestly, is instruction in vacuum, with little relevance to the real world. How do students respond? By asking questions such as "Why do we need to learn this?" or "Will this be on the test?" or "Does this count?"

Why do students tolerate this?

Primarily because they have to! We're in control. The learning environment is mainly defined by what is taught and how it's taught. This tends to create a sense of absolutes. It also rewards rote, memorization and the regurgitation of the 'right' answers needed to pass the test. However, much more than content is learned. Students learn a fundamental approach to life with the teacher as their role model who sends powerful explicit and implicit messages about how and what students will learn.

So what's the message?

Read the book, take the notes, answer the questions, take the test and then forget it (teach test, turf). The teacher speaks, the student listens. The teacher initiates, the student reacts. The teacher is proactive and the student passive. Basically, the message is to follow orders, don't think, just do and your opinions don't really matter. This culture of dependency was a perfect fit with the Industrial Age workplace and mindset. Dependence on manager, following instructions in order to solve problems and once again, don't think, just do the job.

So what's wrong with that?

Today, we live in a fundamentally different world than the world that the previous model was developed for. There has been a technologically driven transformation of the workplace along with a proliferation of automation, robotics and information technologies, but many schools haven't changed. Many are still trying to uphold the fundamental tenets of the Industrial Age workplace. What happens when students are taught this way for 12 months, 13 years and when this becomes the norm? What's contained in Junior's skill toolbox at graduation? What happens when he tries to use the toolbox?

GenNext meets the new workplace

Junior gets a job on a robotic production line. The days of storehouses of inventory are gone forever. They just cost too much. Most businesses today work on the basis of zero inventory and just -in-time delivery systems where products or necessary materials are delivered in a brief window of time. Timing is everything. If supplies don't make it in time, the whole production line may have to shut down. Junior works both independently and as part of team. His job is to deal with complex statistical numerical control systems in order to quickly load trucks in the correct sequence for delivery in a very narrow time frame. This is extremely high-pressure work. One day, Junior's department has a

Management asks for creative to the problem. The department manager turns to Junior for help and requests a definitive solution in the next 24 hours.

How does Junior respond?

Junior blows his mind as terminal overload and immediate physical and mental paralysis set in. What does Junior do? Probably abandon ship!! Chances are that he hasn't a clue as to what to do. Junior is a product of the system - he's been raised in a culture of dependency. In all likelihood, he is a dependent theoretical learner with few applied higher level thinking skills. Consequently, he's generally paralyzed without specific direction because most of his learning has occurred in isolation. Thus, he doesn't easily make connections between subject areas or disciplines; and he has a fragmented, non-holistic approach to problem solving. When he fails to respond to the situation, this leads to questions and complaints about what did he learn in school if at all.

In today's world, what do they want - what do they need?

Business wants team and independent problem solvers with good interpersonal skills. They want people who view issues holistically and who can apply theory to real world, real time, real life situations and who demand excellence from themselves and their team.

What must we teach for this to happen?

We must balance content and process by making implicit and assumed learnings explicit and by using classroom materials that reflect the real world and change the context for delivery of lessons by adding personal relevance to what we teach.

The way things could & should be - another one-act play...

Good morning class. Hurry up and let's get going. I have an exciting problem for you to solve this week. Look, the quicker I get out of your hair - the quicker you can get on with your task. Usual groups please. Okay guys, let's go. Each group has been given an outline of the problem, resource guides, self & group evaluation forms and problem solving forms. They're in the blue envelopes on each table.

Your job for the next 4 periods is to become travel agents - remember that in business today, it's all about adding value to services - there are lots of travel agents out there. Try to keep this in mind as you work through this problem. You will be receiving a phone call shortly from IT Pacific Shipping, one of our biggest clients. Your job is to prepare a complete itinerary for 5 executives who will be traveling to the Kansai region of Japan on September 1st for two weeks. They will need at least 3 days each in Osaka, Kyoto, and Kobe where they will be looking for new business. You should build in at least 4 days of R&R while they are there. Be sure to arrange some good holiday experiences.

some different foods, and maybe even see a cultural event or two. They'd especially like to visit some places that tourists wouldn't normally go.

No I don't think their boss will pay for the trip to the Geisha teahouse Sam! No, it won't help you or your group to get a better grade. Remember, their boss is very price conscious so don't even think about sending them first class! Yes, a Japanese hotel instead of a Western hotel would be just fine. Economy class is good! They'll need complete info and an itinerary including hotels, airfare, railways, possible tourist stops, travel costs, background materials - the works

Please keep a log of your time and be ready to provide them with a detailed bill. And be prepared to invoice me for your mark. The problem is written up in detail in your assignment envelope. I'm available for each group as & when you need me. Just call out my name if you need help.

How is this different?

It includes the things that are needed for success. But it's a different approach. It's not stand-alone content. The content is taught within the context of a process used to solve the problems. The learning is driven by the context of the problem. Giving them the problem helps foster personal ownership of the learning. The students become the owners of their own learning as they deal with real world problems. It becomes their problem, not ours, while providing role-playing opportunities for people with no previous experience.

The teacher's job.

Is to craft just the right problems that provide a framework on which to hang all the information that must be learned so that the content can be learned within a broader context. Do they learn content? Yes of course. But if the content is forgotten, what else is learned? The process skills that can be used again and again.

Transcendental teachers at work

Transcendental teachers use a structured approach; they teach the 4Ds of problem solving (define, design, develop, determine). Learning based on 4 D's of problem solving. In each case, we start with a problem - problems lead to questions - questions lead to ownership of the problem - ownership leads to independent thinking & learning that promote a culture of autonomy. Within each problem, we go through 4 distinct steps...

1. Define

Have you ever taken your car to a garage to have a problem fixed. Ever had the mechanic poke around under the hood for some time, listening to the engine, testing it and then tell you that it's the kadiddle. have it replaced and still have the same problem. Ever had

2. Design

At the Design stage, everything is created twice. This is the formal planning stage where things can be checked by others. There are two distinct types of learning that take place here, because after you know what, you need to do, you also need to know how you are going to do it. Students typically come to us completely dependent on us to tell them what to do to get a good mark, pass the test, pass the course and so on. Using the 4 Ds approach, the yearlong goal is to only teach what the students ask us to teach them.

3. Develop (Do)

At the Do stage, the student puts the plan into action and actually creates something - develops an itinerary, digs a ditch, builds a house, constructs a bridge, writes an essay, performs an experiment, creates a presentation - things that have a real world relevance

4. Determine (Debrief)

At the Determine stage, the student, teacher and peers assess the product in terms of the original goals while also assessing the process. They consider what was learned? How was it learned? How could the product or process be improved the next time around?

What's different here is the use of a fundamental policy of progressive withdrawal from the responsibility for learning. If we want students to become independent thinkers and doers, we must stop solving things for them. Problem solving involves interpretation, interpolation & extrapolation - this is harder to do but we must persist. Students will spend most of their lives living in the real world. They must learn to deal with incomplete information - moving from problems with predetermined, predictable solutions to problems with unpredictable solutions.

To be successful, we must systematically & progressively introduce them to information, disorder, infowhelm fundamental & uncertainty as the norm. We must require students to make their best decisions based on the information at hand Part of this can be done by having students take on roles.

Role-playing is a process that can be applied across all human endeavors. How do you get better at driving, or skiing, or typing? How do you get better at anything? By repeatedly practicing it! If we want students to be ready for modern workplace, our curriculum must have a real world link

What would happen?

What would happen if students were taught like this for 12 months? For 13 years? If this was the norm? What different set of skills would be in their toolbox at graduation?

- to process skills
- to tools
- to real life/world situations
- to community resources
- to authentic assessment
- to parents

What would a unit look like?

An elementary example: The Pet Shop

I'm the owner of a very successful pet shop here in town, but lately there's been a lot of interest in exotic pets and I'm considering expanding my shop to meet the new market. I have just hired a student-consulting group, Call of the Wild, to prepare a report and presentation to me. I want them to come back to me in 10 days with detailed recommendations as to what I should do. They need to be able to tell me what types of animals I should be bringing into the shop? And for each creature I'll need to know how they should be housed - what will be needed to take care of them - what sort of budget will I need to have to cover the new additions and the increased costs of operation - will any special permits be needed - any special considerations? Consider what's being taught here from a four D's & 7 layers approach.

Do they learn content?

- Science - animal behavior, animal care, animal diseases
- Math - calculating feed requirements, calculating a building budget, developing a store budget
- English - writing reports, communication skills, presentation skills ...
- Could you make connections to the areas of Social Studies, Music, Art, PE...

Next, do they learn process?

- critical thinking
- problem solving
- information literacy
- technical reading
- technical writing
- working in teams
- learning in teams

Do they learn tools used in a contextualized manner?

- tape recorder for interviews
- video camera for presentations
- accessing networks

- Hyperstudio for presentations
- Excel for budgets...

Are there school-to-work connections?

- pet store owners
- veterinarians
- accountants
- contractors
- builders
- virtual experts
- virtual zoos
- on-line societies

How about a school-to-community?

Who might have a vested interest in what you're doing in your community?

- government agencies
- zoning departments
- businesses
- media
- seniors
- community activists
- humane societies

Are there ways of being able to connect the school to the home?

- are their ways to inform & communicate?
- can we call on personal expertise & specialist contacts?
- could parents provide guidance & practice in interviewing, research & presentation techniques?
- could parents help with equipment & transportation?
- are there means of extending learning beyond 9 to 3?

How about assessment?

- is it project-based?
- is it contextualized learning?
- is there a means of authentically assessing learning?
- are there means for summatively, formatively, qualitatively and/or quantitatively measuring learning?

A critical question

If they forget content, will anything else of substance be learned? How about the process & problem solving skills that are learned by applying content within the context

A secondary example: The Water Works

We live in a town where the water system is being overwhelmed by new growth. It will take at least 3-5 years to replace the current water system. City Council has decided to hire a team of student consultants to develop a proposal for Council. They have been asked to make recommendations for an interim plan to manage the current water supply until the new one is in place as well as how to inform the community as to how they will be asked to conserve water while the new system is built

Is there a content connection?

- Physics - creating water pressure
- Biology - controlling water quality, analyzing the water table
- Math - calculating water volume & flow
- English - creating information pamphlets, writing reports, making presentations
- Could you make connections to the areas of Social Studies, Music, Art, PE?

Do they learn processes?

- critical thinking skills
- problem solving skills
- research skills
- information analysis skills
- technical reading & writing
- working & learning in teams
- speaking & listening skills

Do they learn tools used in a contextualized manner?

- Netscape & e-mail for research
- WP for report writing
- Science probes
- graphing tools
- Power Point for presentations
- publishing tools...

Are the school-to-work connections in your community?

- city planners
- water engineers
- well drillers
- geologists
- testing agencies
- hospitals
- bottling companies
- waste recycling agencies

- recreation organizations
- environmental activists
- Sierra Club/Greenpeace
- businesses
- realtors
- senior citizens

How about the school to home connection?

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A critical question

If they forget content, will anything else of substance be learned? How about the process & problem solving skills that are learned by applying content within the context of real time, real world tasks. Process skills that can be used again and again in a variety of real life experiences.

SOME GREAT RESOURCES

Analyze and Apply (www.analyze-apply.com)

Another commercial products with about 5 feet of paper-based materials - incredible resources - they cost about \$10 per student - to get an idea of how comprehensive they are, go out to www.analyze-apply.com and download some of the grade specific sample lessons. There 306 instructional units (each having multiple lesson plans) for teachers that change the context and pedagogy for core curriculum instruction, reflect the proficiencies students need in an information rich learning and work environment. There are:

- Grades 1-5 - 96 units
- Grades 6-8 - 72 units
- Grades 9-12 - 138 units

authentic assessment standards and promote community partnerships. The 8 core SCANS proficiencies that students need to operate in an information rich learning & work environment are embedded into the lesson plans, thus changing the context & pedagogy for core curriculum instruction

Units by grade level and subject areas

- Grade 1/2 - 12 Language Arts and Math units for each grade level
 - Grade 3-8 - 24 Language Arts, Math, Science, and Social Studies units for each grade level
 - Grade 9 - 36 Communications Arts, Math, Science, Civics, Algebra 1 and Biology units
 - Grade 10 - 48 Communications Arts, Math, Science, Algebra II, Geometry, Earth Science, Chemistry, & World Geography units
 - Grade 11 - 30 Communications Arts, Service, Learning and Law, US History & Sociology/Psychology, Trigonometry units
 - Grade 12 - Communications Arts, Math, Calculus, Physics, Economics, and Government
- This resource is well worth considering!

Learn and Live (www.glef.org)

Is inspired by George Lucas - it includes a 1-hour documentary hosted by Robin Williams shows innovative schools around the country that are integrating technology into teaching and learning and involving parents, business, and the community. It includes a companion 300-page resource book describing how education is changing nationwide which helps connects readers to experts and information - you can contact them at 1-888-4RKIDS! - \$20

How do educators respond to this kind of instructional model?

Yabbut - yabbut - yabbut - yabbut. Give me a break!!!! How long will this take? What about the tyranny of the school calendar and the curriculum guide? What about all other stuff I have to teach? What about getting students ready for the test? How will I measure learning? Does this mean I'll have to change?

Getting beyond excusitis

It's easy to be yabbutts - it's easy to make excuses as to why it can't be done. If this is the approach of a colleague, then they are truly part of the problem rather than part of the solution. This doesn't have to happen overnight. You aren't expected to go zero to sixty overnight. Start with baby steps. How do you eat an elephant?.....one bite at a time! Where do you start? Declare war on old ways of doing things. Reject pureed, homogenized, predigested, formatted materials filtered through someone else's eyes. Stop reinforcing a curriculum that's a mile wide but only inch deep. Reject a system: that teaches and tests then turfs and that rewards the accumulation of vast amounts of useless theoretical obsolete information or that continues to emphasize and reward

transparently embedded into relevant content and which allows relevant content and processes to be internalized simultaneously.

What's our job?

We have two mandates. The first is the acculturation of our students through which we pass on the accumulated wisdom of our culture; as well as an appreciation of the aesthetic, esoteric, philosophical, and ethical. But our second mandate is equally important to the first. That being to help them become productive members of society who are able to contribute economically at same time they ensure their own financial success. Our underlying assumption must be that the future is not something that just happens to us but it's something that we build day by day and step by step. Education's job is to prepare students for that future they have to face. If we do this well, they will help us face the future we have to face. Our challenge is to revitalize public education. We have no choice. Public education is the cornerstone of this nation, the foundation of our freedom and the building block of our democracy.

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