Thinking in Future Tense

Teaching & Learning on the Edge of the 21st Century By Ian Jukes and Ted McCain

Synopsis:

This presentation focuses on a fundamental shift in the basic paradigm of teaching that is required to prepare students for the new technological world. It provides a pragmatic look at current teacher practices and why they are becoming increasingly out of synch with our rapidly changing world. It then identifies the principles and processes which transcend the new technologies. Participants will come away from the presentation with a clear understanding of how to meet both their curricular goals, as well as prepare students to meet the new realities of the 21st Century. Included is an overview of the 7 layered curriculum model (content, process, tools, school to career, school to community, school to home, and contiguous assessment; as well as a variety of resources to support the transition to this new model.

Handout:

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 - a one-act play.

Have you ever heard this before?

Okay guys, let's go. Come on, let's get moving along here. The bell rang five minutes ago. Where were you yesterday Tom? Focus guys, we have a lot to get through. I only have 3 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 handsout 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 Konsai region of Japan. The Konsai 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 peopleBill - 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, 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.

What's <u>really</u> taught?

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 that 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 problem. Suddenly there are an increasing number of complaints over missed and incorrect deliveries. There is trouble in loading trucks on time in the right sequence. Management asks for creative solutions 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 prepare a complete itinerary for 5 executives whowill be traveling to the Konsai 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. They will definitely want to slip in some sight-seeing if possible.

They will want to visit some religious & historical sites, see the government buildings, do some shopping, try 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 tea house Sam! No, it will 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. 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 broader context. Do they learn content? Yes, of course. 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 which 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 a student write a report or essay on the wrong topic? At the Define stage, we ask the student to restate problem in terms of specifics so that we can all verify where we are going before proceeding any further.

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 <u>what</u>, you need to do, you also need to know <u>how</u> 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 aproach, the year long 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 endeavor. 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 <u>real world link</u>

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? How can we get beyond TTWWADI? (that's the way we've always done it)

Transcendental teachers make 7 connections to 7 layers of learning:

- to content
- 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 mew hat 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
- CD for information access
- Netscape & e-mail for research
- Word for report writing
- 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 of real time, real world tasks. Process skills that can be used again and again in a vairiety of real life experiences.

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

How about school-to-community connections?

Who in community might have a vested interest in this issue?

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

How about the school to home connection?

- 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?
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SOME GREAT RESOURCES

Bridges Career Explorer (www.bridges.com)

The Individual career counselor is an incredible web-based and CD ROM resource for teachers at all grade levels whether you want career information for your students or just want to embed life connections into your lessons. While it is a commercial product (about \$800 per year for all stations at a site), you can go out to *www.bridges.com* and take a close look by signing up for a free one-month membership – take the time to explore.

Bridges is designed for those who know & those who don't what they want to know there is the chance for students to search & research various careers and get detailed information using tools that are driven by personal interests.

For example, suppose that you or a student wanted information about becoming a wildlife biologist – do a search and up comes a screen that describes what a wildlife biologist does in detail.

If you're still interested, you click again and up comes an interview with a wildlife biologist, telling you how they came to be one – what skills they have and how some of the issues are.

If you're still interested, then click again and it poses a series of problems related to being a wildlife biologist and challenges you to show your understanding of the science, math, language, decision-making, communications and personal skills you will need to be successful. In the case of the wildlife biologist, amongst other things, you have to calculate how much a grizzly bear weighs so that you can figure out how much tranquilizer you have to put in the gun in order to knock down but not kill the bear (and ensure that it doesn't wake up when you're moving it.

If you're still interested, you click and it connects you to multiple web sites set up by wildlife biologist organizations. The information is regularly updated by dozens of on-line researchers. THIS SITE IS A GOLD MINE

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 **3**06 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

The activities integrate adult roles into the classroom and in doing so, connect the curriculum with the workplace by developing units that focus on cooperative, interdisciplinary, problem solving based learning. The materials include extensive 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)

- inspired by George Lucas
- 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

- companion 300-page resource book describing how education is changing nationwide which helps connects readers to experts and information
- 1-888-4RKIDS! \$20



How do educators respond to this kind of instructional model?

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 yabbuts - 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 memorization and regurgitation. Reject a system that collectively leads to students suffering from informational anorexia and intellectually starved students.

Shift gears to:

A critical thinking, problem solving focused curriculum where process skills are 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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