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Critical Thinking through Personal Learning
Integrating Pedagogy and Web 2.0 Technologies

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Overview & rationale

The Digital Disconnect

Writing in 2002, demographic researchers stated schools and teachers have not yet recognized – much less responded to – the new ways students communicate and access information over the Internet" (Levin, Arafeh, Lenhart & Rainie, 2002).

In fact, the same researchers noted, "[s]tudents repeatedly told us that the quality of their Internet-based assignments was poor and uninspiring. They want to be assigned more—and more engaging—Internet activities that are relevant to their lives." (Levin, et al., 2002).

Since this report, "The Digital Disconnect", two developments in technology have made it not only "nice", but *necessary* for teachers to meaningfully integrate "Real, Rich and Relevant" learning (March, MMS). The first is broadband to computer – and now to personal devices like phones, mp3 players and game controllers. This means that online resources are no longer constrained to text and simple animations but can encompass the rich media of music, movies and multi-user games. The second development is what many refer to as Web 2.0. One aspect of this new generation of the Web is that visitors can do more than download or "pull" information from Web. New applications "push" targeted content to visitors based upon prior use or formal requests made through subscriptions and registrations. Although this may not seem like such a change, it is equal to the difference between getting junk mail or what tops your wishlist.

The New WWW

This anytime, anywhere opportunity to immediately access your most gratifying pastimes is what has been referred to as "The New WWW: Whatever, Whenever, Wherever" (March, 2005). The problem with regularly pursuing pleasure is that instead of leading to a happy life, it prompts apathy and inertia (Seligman, 2002). As adults, we sometimes know this. Young children rarely do. They are convinced that getting what they want will make them happy.

The threat to children posed by getting "whatever they want, whenever and wherever" was recognised in the Australian Commonwealth report Beyond the Middle (Luke & Elkins, 2003). The authors conclude that in the current globalised culture, it is the "middle years students who are clearly most 'at risk'". Specifically they note that "childhood and adolescence have become the sites for large scale engagement with multinational consumer culture and sophisticated engagement with new technologies and mass media" (Luke & Elkins, 2003). Two key factors that place them at risk are stress and boredom (Hall, 2003). Luke and Elkins make the connection between the lure of enticing media gratification and the boredom and stress of some schools when they state,

> Where many youth in the middle years are not already 'at risk' in light of these new

conditions, it is quite plausible that unresponsive, irrelevant and inflexible educational structures can make them 'at risk'.

What is Education to Do?

Education is left with three choices:

1) Ignore technology and the increasingly personalised global culture and commerce.
2) Limit students from 'lure', because we, even though we don't know much about the online world, "know better".
3) Use the power of personal technologies and rich media to engage students in meaningful and rich learning so that they are empowered to think critically and to make effective life choices.

The following project is made for educators who choose #3 ;-)

Pedagogical Foundation – Layers of Robust Theory

Can Schools Make a Positive Difference?

If schools seem less relevant to the lives of learners and the acquisition of information, what is the most important, overarching contribution they can make?

The Effect of Academic Optimism

Socio-Economic Status (SES) has long been shown to have a direct impact on student achievement. Where students come from says a lot about how they will perform in school. Can attending school have a greater impact than SES and prior academic success? Although this seems a huge task, for schools to justify themselves, shouldn't just such an impact be expected?

Research by Hoy, Tarter, & Woolfolk Hoy (2006) sought factors other than SES that might explain why students at some schools demonstrate higher levels of academic achievement (2006). They have posited "a new construct, academic optimism", and conducted studies "to explain student achievement while controlling for SES, previous achievement, and urbanicity".

Academic optimism made a significant contribution to student achievement controlling for demographic variables and previous achievement.

The construct identifies three "tightly woven" properties that work together to create a positive school culture that improves student achievement: "academic emphasis", "collective efficacy", and "faculty trust in parents and students". Their research confirmed the construct.

Because this holds such potential for student achievement, all teachers at each of the schools participating in the current study will anonymously complete Hoy et al.'s "Organizational Health Inventory (OHI)". This is a simple survey that yields scores in academic optimism. Schools will remain anonymous, but scores will be factored in to control for school effects and possibly lead to further research.

Can Students Become Lifelong Learners?

Because emerging technologies provide students with almost unlimited opportunities to both learn and amuse themselves, the fulcrum for making rewarding choices lies in motivation. Are students motivated to fulfil their potential or succumb to superficial distractions? Tied to this question is whether students are intrinsically or extrinsically motivated.

Intrinsic Motivation

More traditional approaches of extrinsic motivation can "produce immediate rote learning, but they impair conceptual learning and they lead to greater loss of the rote learning. Furthermore, they are associated with lower levels of self-esteem and higher levels of anxiety" (Deci & Ryan, 1985). Heavy use of extrinsic motivation, such as grades, high-stakes tests and punishment for poor performance, undermines psychological well-being and increases students' likelihood to experience depression, anxiety and conflicted interpersonal relationships (Vansteenkiste, Simons, Lens, Sheldon & Deci, 2004). Significantly, the clinical manager of an addiction treatment service noted that "the desire to escape the routine, or stress, of life is a reason people become addicted to the Internet" (Hall, 2003).

Conversely, when student learning is encouraged through intrinsic motivation, the outcome is better. Vansteenkiste et al. (2004) conducted three separate studies that tested variables of "intrinsic goal framing" and "autonomy-supportive versus controlling context" and found a positive effect for each when used individually, but the greatest gains were achieved when they were used together. Specifically, improvements came in students' self-reported depth of learning as well as objectively assessed academic performance in conceptual learning.

Three Predictors of Intrinsic Motivation are:

1. control or autonomy
2. competence or self-efficacy, and
3. relatedness or connectedness.

Thus, because our students confront innumerable choices, using a pedagogy that is both academically effective and contributes to positive well-being would appear to align with goals for students to develop the characteristics of lifelong learners. Ryan and Deci (2000) identify three key perceptions on the part of the individual that sustain intrinsic motivation. These are perceptions of control or autonomy, competence or self-efficacy, and relatedness or connectedness.

To make these gains more likely in the current study, students will have choices within an activity, receive online support so that they can experience themselves as capable, and work within an environment that promotes community. Through these and other means, the goal is to leverage the factors that sustain intrinsic motivation.

To measure students' perceptions of the key factors, they will complete pre- and post-tests of one or more of the following measures: the Intrinsic Motivation Inventory (IMI), the Academic Self-Regulation Questionnaire (SRQ-A), and the Learning Climate Questionnaire (LCQ).

Can Students Develop Sophisticated Thinking Skills?

Because young people use the Internet and other technologies they need to develop sophisticated thinking skills for two main reasons. First, as noted in Beyond the Middle, they are among the most sought after and vulnerable targets for global marketers. Second, the very nature of the Web requires sophisticated thinking skills to make sense of what is an unstructured information source and ultimately unverifiable. What is the best approach to helping students develop such advanced thinking abilities?

The Delphi Report (American Philosophical Association, 1990) described the ideal critical thinker as one who is

> habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in

> inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.

The literature of critical thinking has recognised that to achieve these goals, students need not only the capacity (or "skills"), but also the disposition to engage in such practices (Perkins, Farady, & Bushey, 1991). This involves both a sensitivity and an inclination to engage in critical thinking (Perkins, Jay, & Tishman, 1993). These include such tendencies as to explore, to be curious, to clarify, to take intellectual risks, to be planful, to evaluate and to reflect. The pedagogical solution to develop thinking dispositions in students is to embrace the skill-centred approach within a context of enculturation. This model emphasises "the full educational surround" and "asks teachers to create a culture of thinking in the classroom" (Tishman, Jay, & Perkins, 1992).

The Seven Thinking Dispositions are
The disposition…

1. to be broad and adventurous
2. toward sustained intellectual curiosity
3. to clarify and seek understanding
4. to be planful and strategic
5. to be intellectually careful
6. to seek and evaluate reasons
7. to be metacognitive

Two specific strategies will be used in the current study to promote a culture that encourages advanced thinking. The first, based upon on-going research by Harvard's Project Zero group, is *thinking routines*: "simple patterns or structures, used over and over again, that support and scaffold specific thinking moves or actions" (Ritchhart, Palmer, Church, & Tishman, 2006). The primary purpose of thinking routines is to make the "thinking of everyone in the classroom more visible and apparent" (Ritchhart et al., 2006). One typical thinking routine that was particularly successful in the research by Ritchhart et al. is the "SEE-THINK-WONDER" strategy in which students in a class are asked: 1. What do you see? 2. What do you think about that? 3. What does it make you wonder?

Built into the frequent use of several thinking routines will be an appreciation for, and retention of, the complexity inherent in a topic. When students pursue more than introductory knowledge on a subject and use the Web as information source, they engage in "advanced knowledge acquisition" in an "ill-structured domain" (Spiro & Jehng, 1990). Furthermore, Spiro and his colleagues argue that poor learning outcomes are often the product of "the design of instruction which represents the instructional domain and its associated performance demands in an unrealistically simplified and well-structured manner" (Spiro, Feltovitch, Jacobson & Coulson, 1992). The model they developed was Cognitive Flexibility Theory, a constructivist approach that "emphasizes the real-world complexity and ill-structuredness of many knowledge domains" (Spiro et al., 1992). This is the second of the two specific strategies.

To access student performance in critical thinking, two measures will be used. First, the Metacognitive Awareness Inventory (MAI) will be used as pre- and post-test. Second, a common concluding task will be designed that will be assessed externally using a critical thinking rubric.

How can Emerging Technologies Support Student Learning?

In the past five years new technologies have entered the lives of our adolescents. Lee Rainie, Director of the Pew Internet & American Life Project, neatly captures these changes in an article (Rainie, 2006) describing "Digital Natives" entering the workforce:

> And at the dawn of high school for our worker in 1999, Sean Fanning created the Napster file-sharing service. When the worker graduated from high school four years later, his gifts might have included an iPod (patented in 2002) and a camera phone

> (first shipped in early 2003). Our worker's college career saw the rise of blogs (already two-years-old in 2000), RSS feeds (coded in 2000), Wikipedia (2001), social network sites (Friendster was launched in 2002), tagging (Del.icio.us was created in 2003), free online phone calling (Skype software was made available in 2003), podcasts (term coined in 2004), and the video explosion that has occurred as broadband internet connections become the norm in households (YouTube went live in 2005).

Common elements among these technologies are increased power, personalisation and participation. In fact, so many new developments have emerged in recent years that popular consensus has come to refer to this new iteration as "Web 2.0" (O'Reilly, 2005). Core elements of this new movement include enriched browser-based interactivity (Google Maps), software that encourages user contribution (Wikipedia), and network services that remix data from all sources, particularly user-generated data (the basis of the Google empire and motivation for its suite of "free" applications) (Hinchcliffe, 2006).

This study will use "Web 2.0" software to take advantage of digital technology's power to engage students in personalised learning. Given the above review of the literature, the online environment will be designed to honour user-autonomy, facilitate achieving intrinsically motivated goals, and use community and social networking to promote rich, contextualised learning experiences. The technology makes such an approach possible, yet few who have visited MySpace, LiveJournal or Facebook would argue that providing youth with access to the technology alone produces anything approaching our goals of advanced cognition.

How will Students Know How to Use the Technology to its Best Effect?

The pedagogical solution is to provide an overarching framework that offers guidance for student-directed learning. The model is named CEQALL (pronounced "seek-all") and stands for Choice • Effort • Quality • Attitude • Labour of Love.

Choice

For students to take ownership of their education, they must enjoy the opportunity to control the direction of each personal learning experience. Deci and Ryan's Self-Determination Theory has shown that combining learner control with intrinsic goals produces increases in depth and retention of learning. Choice also suggests two aspects related to the curriculum. First, a range of activities are available to the learner – this is not a blank page where anything goes, but scaffolded activities that enable learners to encounter rich, contextualised endeavours. Similarly, learners identify the outcomes they want to master by choosing from a student-friendly version of locally chosen learning standards.

Effort

Once students have been able to find themselves in the learning goals, the next task is to apply Effort. Although this aspect is not overtly identified in either Motivation Theory or the Thinking Dispositions, clearly the competency / self-efficacy predictor of intrinsic motivation is not achieved without exertion. Likewise, the "planful" nature of thinking dispositions requires energy as does the advanced cognition of constructing meaning from complexity. Interestingly, the requirement of students to invest Effort may be the most radical aspect of the CEQALL model in comparison to the traditional approach where students are expected to be passive and compliant.

The construct of Academic Optimism also illuminates the role of Effort. Hoy et al. (2006) chose the name for this organisational measure inspired by Seligman's (2002) work on optimism and authentic happiness. One aspect of Seligman's research is that

all three avenues to authentic happiness involve an expenditure of effort. Thus, when students invest their best efforts in a task, it becomes meaningful through the process. Similarly, competence or self-efficacy is likely to increase through the very same effort. Third, by working together toward a goal, students develop feelings of connectedness.

Quality

Once students have been able to find themselves in the learning goals and expend substantial Effort, the next absolute is Quality. This is where a shift takes place away from the traditional schooling to personal learning. If a student chose their learning goals and invested their best efforts in the task, why wouldn't they pursue a Quality outcome? There is no place for the busywork that often serves only classroom management goals. With students responsible for choosing their learning goals and outcomes, the teacher's role is now – honestly – that of coach and mentor. Quoting from a colleague of Seligman, Csikszentmihalyi (1991) states that when teachers "empower students to take control of their learning" their job changes:

> they provide clear feedback to the students' efforts without threatening their egos and without making them self-conscious. They help students concentrate and get immersed in the symbolic world of the subject matter. As a result, good teachers still turn out children who enjoy learning, and who will continue to face the world with curiosity and interest.

Thus the pursuit of Quality yields the twofold benefit of achieving the learning outcomes that are valued academically as well as personal well-being.

Attitude

Even after students have a Choice in their work and complete the activity in a Quality manner, the Effort has been misspent unless a positive attitude is part of the outcome. The Joy of Learning is a direct product of personal expressions (Choice) and best efforts (Quality). If the attitude isn't right, the Choice and Quality weren't honest. Thus, the Attitude phase is an intentional point of reflection. In case learners have found it easier to "go through the motions" of Choice, Effort, and Quality, without honestly serving their own interests, their attitudes will show the truth. Teachers are likely to spend more time at this stage mentoring learners – as learners – not necessarily focusing on the content or outcome of the learning. This modelling and discussion of what it means to be a sincere learner makes overt the culture engendered by CEQALL. Like the Thinking Routines that carry the epistemic message of valuing thinking and learning, the CEQALL process emphasises that the students are important, capable individuals who are part of a collective effort to grow and learn.

As stated, Attitude serves as a reflection point along the CEQALL path. If all has gone well, students will have achieved a quality outcome and feel good about it. If their attitude lacks enthusiasm, they may decide to revisit any or all of the previous stages. Perhaps their Choice needs adjustment up or down. Maybe more or different Effort is required. Similarly, they might seek additional feedback, coaching or inspiration to create something of unmistakable Quality. Conversely, if they are so motivated, they might decide to continue on their current journey, pursuing deeper learning, advanced skills or public exhibition through a Labour of Love.

Labour of Love

Ultimately, happy and productive people are self-initiated. They get curious and engage themselves in the world and are a benefit to it when they make their contributions. Over the course of students' middle and secondary education, they will find things that they are called to do. This already occurs in today's traditional schools where exemplary students become local legends in musical composition, advanced

maths, the visual arts. Some students find their niche and pursue their interests either through or in spite of their schooling. This connected, optimal experience that Csikszentmihalyi calls *Flow*, can be more widely available to all students if we allow them to explore their personal learning goals in an environment that supports and stretches their endeavours.

How would this Curriculum Look?

To take advantage of the richness and authenticity available when using the Web as a resource and medium for learning, a special Web portal is being created for the project. Playing off the idea of MySpace as a popular social networking destination for many teens and young adults, the content for this study is called MyPlace. It is an interdisciplinary year-long project that provides students with an opportunity to engage in a deep process of self-directed learning and self definition. More exploration than acquisition, MyPlace enriches students' attempts to see themselves realistically and to find meaning within a personally relevant contemporary context.

Our students' immediate future will be unlike anything we have experienced:

- the World Wide Web is set to morph into a personalised, WiFi-delivered, digital aura that hovers over our students, promising an endless stream of mesmerising games, music, movies, and social networking opportunities. Why wouldn't they want to "amuse themselves to death?"
- the "World is Flat" declares Thomas Friedman which suggests that all our graduates will enter a global workforce where they will both compete and collaborate with tens of millions of highly motivated and educated peers from countries like China and India.
- the geopolitical adventures of recent years promise decades of uncertainty and tension. How Australia chooses to participate in our region and globally will challenge our students' values and courage.
- emerging changes in climate seem poised to radically alter the global landscape, affecting agriculture, commerce, tourism, water supplies and the very viability of many populations. Can we plan, adapt or merely survive?

See http://tommarch.com/blogs/myplace for more details on MyPlace.

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