

ABSTRACT

Why should students bother attending classes when they have access to a greater spectrum of information conveniently at their fingertips whenever they want and wherever they may be? As the Internet has enabled an unprecedented amount of information and media available to the world, it would seem logical to witness a gradual shift away from the built classroom of instructors engaging students to think, to the rapid access of immediate results and answers online. This paper argues that the online environment is not a replacement for teaching; rather that quality teaching may emerge from several deficiencies that online resources suffer from. In the process of proposing solutions to this online dilemma with more conventional teaching models, the paper will elaborate upon an initiative referred to as the 5 P's of pedagogy aspiring to improve the value of quality teaching in post secondary education institutions.

INTRODUCTION

The onslaught of digital information has precipitated a network of information where *accessible resource* and *authorized resource* have become synonymous. This trend has gradually led to concerns over the value and quality of teaching in traditional pedagogical models. Through reframing conventional teaching within the context of projects, profession peers, professors, and personal growth, referred to as Five Dimensional Pedagogy, students may readily understand the value of quality teaching supported by contemporary digital technologies that may enhance the teaching experience. As instructors, we must make it clear to students that we may offer a depth and breadth of experience that adds value to their quality of education. It is through these steps that a greater value may be emphasized on classroom learning as opposed to that which is so seductively immediate and available in digital environments.

In his seminal paper "*Computing Machinery and Intelligence*", the father of computer science, Alan Turing established the framework of artificial intelligence by asking "can machines think?". As a hypothetical evaluation calling for a computer and a human to maintain a conversation with a secluded human "interrogator", the Turing Test measures a computer's demonstrated intelligence by its capacity to convincingly present itself as a person.¹ The question today is no longer whether or not machines are capable of thinking; rather it must be reframed to ask whether society, specifically at a student level, is capable of thinking, high level synthesis, and innovation in light of the vast collection of information contemporary technologies have afforded them. Turing's evaluation of intelligence stemmed from an assumption that reaction and interaction would denote intellect; however the experiment did not address critical elements of thinking including synthesis and innovation. Unfortunately the combination of the Millennial generation coming through the ranks of post secondary education and the rapid capacity, access, and speed of information networks has precipitated learning environments embracing the Turing model of intelligence rather than traditional ones focused on introspective development and synthesis.

ONLINE AND OUT OF CLASS

The integration Internet-based information is invaluable yet we must examine their incentive to actually attend classes in person. Various studies have been conducted and demonstrate that a hybridized delivery of course material at post secondary levels can improve students' perceptions of what they have learned.² Student access to course material online has been statistically demonstrated as improving academic performance.³ It is important to note that the issue here is not the media, but the instructor-driven content that has empowered student performance. This only supports the belief that online technologies should be appropriated to support (rather than supplant) quality teaching in the classroom.

Quality education does not necessarily mandate traditional in-class activities and pedagogical models however the fundamental notions of making material relevant to students remains the same regardless of the degree of technological integration. In a study conducted by the Chicago College of Pharmacy studying students' motivations for class attendance, it was revealed that teacher behavior and the presentation of new and relevant material had significant impacts as incentive for student turnout.⁴ The quality of teaching is incumbent on the instructor and the associated delivery.⁵

THE NATURE OF TODAY'S STUDENT

We are currently teaching an evolving group of students that is not only able to access a wide array of material, but also behaviorally different from any other generation. Prensky has referred to this generation as "digital natives" who have been brought up immersed in the media of the digital age from video games to cell phones to Internet access and able to be "native speakers" of these digital languages.⁶ At over 80 million, they are the crest of a tidal wave of new students and motivated to perform well with great confidence while simultaneously falling prey to an inability to comprehend macro and micro levels of information and connect with academic material.⁷ This generation's access to a great deal of technology has brought about its specific attitudes on learning and teaching. Millennial students, those born between 1980-1995, have been noted as smart yet impatient, able to multi-tasker yet lack depth of skill, networked yet vocally autonomous, and most notably information-rich yet attention-poor.^{8,9} It is within this context that instructors must struggle to make their material relevant and engaging.

ACCESS TO DIGITAL TOOLS

Contemporary pedagogy has sought to integrate online material into course delivery, to address these "*digital natives*" demands. Online courses have typically offered a range of tools ranging from simply serving as a course material repository to engaging students in virtual interactive environments. Incoming students are highly tech-savvy and able to navigate online teaching environments with ease however studies have revealed that the depth of their understanding was extremely variable.^{10,11}

Students are increasingly using the speed and breadth of material available on the Internet in not only accessing information but also producing and reformatting it within the Web 2.0 age we currently live in. From wikis and blogs to podcasts and social networks, students are laying the foundation for a rapid proliferation of material online. With barriers to entry and creation low, students are empowered with a high level of comfort in production with "web-based

collaboration-ware". This trend is not without its share of problems. With the mass collaborative efforts of information stores such as Wikipedia, information is constantly in flux and subject to unreliable collaboration.¹² This has brought about what Nicholson refers to as the "cult of the amateur" where global information networks have begun to rely on fewer references and resources in the pursuit of rapidly broadcasting information.¹³ Information is increasingly readily available while it is simultaneously increasingly suspect.

In some instances, the onset of these digital tools has precipitated an increased adoption of online course delivery as a potential replacement for in-class learning rather than integrated as an additional facet to a pedagogical framework. By quantitative measures, both models reflect a similar outcome, but the level of articulated learning varied immensely with solely online courses.¹⁴ Despite the increased use of these online educational models, it has become increasingly clear that curricula based solely on virtual environments *"have been a catastrophic failure despite early predictions that web-based learning was a "tsunami that was sweeping the ivy-clad university of the past away" with more institutions shifting to hybridized in-class and online pedagogical models.*¹⁵

A RESPONSE TO THE TREND: A 5 DIMENSIONAL PEDAGOGY

Contemporary instructors and educational leaders must integrate digital tools into their curriculum while remaining mindful of not pandering to students by "killing higher education" with concessions to students' desires.¹⁶ Teachers must actively make decisions in not only what they present to their students, but also how it may be delivered.

The groundwork for the development of the Five Dimensional Pedagogy stems from a reaction to the need to not only present material to students but to also truly teach them by way of rendering material accessible and relevant. Noel Entwistle describes the need to add value to the educational environment and "to distinguish between explanatory theories (which increase our understanding of the interactions) and the action theories (which guide practice and are couched in accessible language)."¹⁷ Entwistle's delineation of pedagogy clearly articulates the instructors' value as one of engagement in promoting quality education. Given the conditions decried by Nichols and many other educators, an initiative was developed to enhance the quality of teaching within a suite of courses in the architecture curriculum within two Canadian universities. With a strong focus on promoting the value of pedagogy reframed within a series of multiple stakeholder dimensions, including professors, projects, peers, professional industry, and personal growth, the 5 Dimensional Pedagogy model was developed and has promoted a higher quality of teaching at both institutions. Ultimately the value of implementing this model has not only witnessed incredible pedagogical returns, but also a contagious culture of continued pedagogical improvement seeking to work in tandem with the ever-changing student body.

PROFESSORS

The first tenet of five dimensional pedagogy charges the *professor* to address the nature of (rather than the desires of) their students. Though many online tools provide channels to distribute information, ultimately professors and instructors are the arbiters of how and what

should be taught in a curriculum. Recent research on the differences between online and conventional models of learning indicated that the immediate presence of a clear framework overseen by an authority on the matter was invaluable in improving the quality of teaching.¹⁸ The web affords students varying access to information on literally anything yet these online environments do not provide a strategic pedagogical framework that a sensible instructor may provide.

Professors must now clearly surface metrics and rubrics that they have always used to today's student. As these students continually work within a structured framework with increased demands for transparency and accountability, it behooves instructors to be similarly explicit in establishing pedagogical objectives.¹⁹ At the same time, instructors must be able to provide measures to assess what students have actually learned. This is where the value of creating an engaged classroom dynamic is clear. Though there are many proven strategies for methods of creating engaged learning environments (both online and off), the underlying value in nurturing them is to permit students to feel comfortable asking questions such that both student and instructor may understand what must be addressed in future lessons.²⁰

PROJECTS

As the professor makes the material engaging and applicable, it is through the *projects* issued that students begin to demonstrate the desired learning. Once again the virtualized environment provides a great deal of information, yet this torrent of data is not learning. Carlson best articulates students' attitudes on projects when he writes, "*they want to learn only what they have to learn, and they want to learn it in a style that is best for them... often they prefer to learn by doing.*"²¹ With online data resources alone, students neither receive meaningful projects nor are they properly paced or provided reasonable, defined boundaries for what scope of work is manageable.

Beyond creating engaging exercises to demonstrate desired learning, it is again important to recall the value of understandable metrics with explicit measures of performance. For today's student, what gets rewarded gets done. Beyond this, it is important to not only evaluate student performance, but follow up with clear comments or evaluations ensuring proper address of potential improvement for future assignments. Online technologies may help in providing these reviews and evaluations however the environment itself cannot generate focused pedagogical objectives or substantial qualitative review of student work.

PROFESSIONAL INDUSTRY

An absolutely incredible feature of today's access to the spectrum of information is its remarkable interconnectivity. Within a matter of clicks one may casually jump from a news article on economic forecasts to endangered animals. Similarly, not limited with access to a range of academic topics, students are able to quickly literally make the connections between what is taught in academia and what is required by the *profession*. Making material relevant to applied practice has been cited as a common demand in contemporary teaching.²² The access to information afforded by superficial perusal on the internet may not necessarily reflect the true application and relevance of material covered in academic circles.

In order to address this situation and increase the quality of education in the curriculum, instructors must not only “bring in the real world” into the classroom, but also showcase the very real impact of failing to understand the material covered in the curriculum. Though the industry often dictates what students must know in order to enter the workforce, it is the instructors that must lay the foundation for the quality and sensitivity to appropriate ethical and professional decisions students may make upon graduation. Additionally, high quality instructors are able to enhance the material taught in their courses by not limiting the material to specific tasks or careers; rather they may showcase a range that engage course material. In this manner students are able to assess the value of the material as applied to their own situations and professional trajectories.

PEERS

The online environment offers a great deal of robust communication tools that should be encouraged as methods to foster extensive *peer* work. Though the Millennial generation shares a team-oriented and networked mentality, as characterized by the explosive value of social networking sites such as Facebook and Twitter, rarely does the digital world provide a truly high quality learning environment. Collaboration is limited despite the available technological capabilities. In a study comparing online discussions and face-to-face discussions, the researchers concluded that one of the major factors that impeded these virtual communities were the time commitments that such a system required and the limitations of what could be presented in such a medium.²³ Another limitation in the use of online group work concerns the nature of team dynamics. The primary basis for significant online peer relationships tends to emerge from acquaintance in reality which does not provide an accurate simulation of the real world where people working in tandem often are not necessarily friends.

Instructors must ensure that when providing group assignments, students must not only have access, but also opportunities to truly contribute to individual learning with a range of people and not necessarily those they are familiar with. In “*Digital Media, Youth, and Credibility*” the authors emphasize Millennial students believe “*that the only real authorities in the digital world are themselves.*”²⁴ Having students become critical of each others’ works is important as the shared pool of experiences will define submission standards they often see as the minima and likely would therefore exceed. Though the networked framework is available it is incumbent on instructors to optimize its pedagogical value to encourage mutual support.

PERSONAL GROWTH

It has often been stated that the Millennial generation is self-focused but simultaneously concerned with a greater communal responsibility.²⁵ Students wish to learn however the strategic frameworks are not necessarily available online. Internet accessibility provides a great spectrum of data yet there are no comparable or standardized metrics for pedagogic development. At best, even self-motivated students tend to study what is easy and immediately accessible and at worst students may explore and study what *they* believe is critical for their own *personal growth*.

In order to add value to the pedagogical process, instructors must pay close attention to the personal growth of students and cater to the diverse needs and learning styles of today's student population. Certainly this would include the adoption of online environments and technologies, however one must examine the methods to ensure students may remain engaged with all aspects of a course's material. At a very primal level, students understand the value of quality education within the context of Maslow's hierarchy.²⁶ Superficial exposure on the Internet may highlight physiological and security needs students may have however the value of instructors' presentation of incentive driven material may empower students to address social, self-esteem, and self-actualization needs on their own.

CONCLUSION

The rapid access to information has altered traditional pedagogical models and rendered information a commodity. Instructors must find methods to elicit synthesis and value to frameworks provided by educational institutions that surpass information processing and instead offer quality teaching. It is undeniable that contemporary digital tools are ubiquitous facets of pedagogical models and must continue to develop in tandem with progressive pedagogical practice to deliver a high-caliber education. The value that instructors may impart in their classroom environments must be reframed within a different series of perspectives as outlined in the Five Dimensional Pedagogy to ensure a benchmark of quality teaching is present in the classroom. If not for a change in perspective, we run the risk of not only alienating students from formalized educational institutions in favor of easy access to online information, but worse still, allowing them to atrophy into the bare minimum of Turing's responsive intelligence.

¹ Turing, A.M. Computing Machinery and Intelligence. 1950. (21 Aug. 2009)

<http://www.loebner.net/Prize/TuringArticle.html>

² Riffell, Samuel and Sibley, Duncan. "Using web-based instruction to improve large undergraduate biology courses: An evaluation of a hybrid course format." Computers & Education. Vol. 44, Issue 3, Apr. 2005. Pp. 217-235

³"The use of online lecture resources, lecture attendance, and examination performance were positively related... students may be able to successfully compensate by viewing online lecture resources when unable to attend class."

Grabe, M., and Christopherson, K. "Optional student use of online lecture resources: resource preferences, performance and lecture attendance." Journal of Computer Assisted Learning. Vol. 24, Iss. 1. 14 Feb 2007. Pp. 1-10., Blackwell Publishing.

⁴ Fjortoft, Nancy. "Student Motivations for Class Attendance." American Journal of Pharmaceutical Education. Article 15. 18 Feb. 2005.

<http://www.ajpe.org/aj6901/aj690115/aj690115.pdf> (29 Aug. 2009)

⁵ A study of three hundred undergraduate students revealed a strong negative correlation between final marks and lack of attendance in class, while at the same time many other studies have also demonstrated the positive impacts of class attendance on academic performance.

Engagement with an instructor in conventional pedagogical settings in class is directly related to quality learning.

Gump, Steven. "The Cost of Cutting Class: Attendance as a Predictor of Student Success." College Teaching. Vol. 53, 2005.

Stanca, Luca. "The Effects of Attendance on Academic Performance: Panel Data Evidence for Introductory Microeconomics." The Journal of Economic Education. Vol. 37. No. 3. Summer 2006. Pp. 251-266

⁶ Prensky, Marc. "Digital Natives, Digital Immigrants." On the Horizon. Vol. 9. No. 5. Oct. 2001. MCB University Press.

<http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf> (14 Sept. 2009)

⁷ Howe, Neil and Strauss, William. "Millennials Rising: The Next Generation." 15 Jan. 2006. (2 Sept. 2009)

<http://www.studentprograms.vt.edu/publications/millennials.php>

⁸ Nicholson, Peter. "Information-Rich and attention-poor." *Globe and Mail*. September 19, 2009.

<http://www.theglobeandmail.com/news/opinions/information-rich-and-attention-poor/article1285001/> (19 Sept. 2009)

⁹ *Wired* magazine editor, Kevin Kelly, describes the increasingly consumer-based model of digital culture as espousing "intangibles" that generalize today's online world: immediacy, personalization, interpretation, authenticity, accessibility, embodiment, patronage, and findability.

Kelly, Kevin. "Better than Free." *The Third Culture*. 5 Apr. 2008. (22 Aug. 2009)

http://www.edge.org/3rd_culture/kelly08/kelly08_index.html

¹⁰ Kennedy, Gregor, Judd, Terry, Churchward, Anna, Gray, Kathleen, and Krause, Kerri-Lee. "First Year students' experiences with technology: Are they really digital natives?" *Australian Journal of Educational Technology*. 2008. 24(1), pp. 108-122

¹¹ An interesting fact is that in many cases this trend to appropriate online course material stemmed from a handful of students. In a survey of nearly 600 faculty on reasons why they adopted online course management systems indicated that "student requests" was the motivator for less than 5% of the sampling. This is in no way an indication of student reluctance to use online environments; rather that their online activity is discrete from their academic endeavors.

Morgan, Glenda. "Key Findings: Faculty Use of Course Management Systems." *Educause Center for Applied Research*. May 2003.

http://www.la.edu/include/learning_resources/online_course_environment/online_teaching/ekf0302.pdf (29 Aug. 2009)

¹² Boulos, Maged. Maramba, Inocencio, and Wheeler, Steve. "Wikis, blogs and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education." *BioMed Central Medical Education*. 6:41. 2006

<http://www.biomedcentral.com/1472-6920/6/41> (13 Sept. 2009)

¹³ Nicholson, Peter. "Information-Rich and attention-poor." *Globe and Mail*. September 19, 2009.

<http://www.theglobeandmail.com/news/opinions/information-rich-and-attention-poor/article1285001/> (19 Sept. 2009)

¹⁴ The comparative research study conducted by the University of South Dakota has indicated that students fared evenly in "pre and post-quantitative measures of learning outcomes" however the actual level of learning described by students varied between online courses and face-to-face learning.

Reisetter, Marcy, LaPointe, Lorelee, and Korcuska, James. "The Impact of Altered Realities: Implications of Online Delivery for Learners' Interactions, Expectations, and Learning Skills." *International Journal on E-Learning*. Vol. 6. Iss. 1. Jan. 2007. Association for the Advancement of Computing Education (AACE). Chesapeake, VA.

¹⁵ Parslow, Graham. "Virtual Universities Are Not About to Replace Face-to-Face Teaching." *Biochemistry and Molecular Biology Education*. Vol. 33, No. 2. P141. 22 Dec. 2004.

¹⁶ Carlson, Scott. "The Net Generation Goes to College." *The Chronicle of Higher Education: Information Technology*.

¹⁷ Entwistle, Noel. "Research into student learning and university teaching." *BJEP Monograph Series II*, No. 4. – Student Learning and University Teaching, Vol. 1, No. 1. 1 Jan. 2007. Pp 1-18

¹⁸ Stodel, Emma, Thompson, Terrie Lyn, and MacDonald, Colla. "Learners' Perspectives on What is Missing from Online Learning: Interpretations through the Community of Inquiry Framework." *The International Review of Research in Open and Distance Learning*, Vol.7, No. 3., 2006. ISSN: 1492-3831

¹⁹ Coates, Julie. 2007. *Generational Learning Styles. Generation Y – The Millennial Generation*. River Falls: LERN Books

<http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/GenY.htm> (12.28.2008)

²⁰ Kelly, Sean. "Classroom discourse and the distribution of student engagement." *Social Psychology of Education*. Vol. 10, No. 3. 11 August, 2007. Springer Netherlands. ISSN 1381-2890.

²¹ Carlson, S. 2005, October 7. *The Net Generation in the Classroom*. *Chronicle of Higher Education*. Washington: The Chronicle. pp.A34-A37

²² Piotrowski, Andrzej and Robinson, Julia. 2001. The Discipline of Architecture. Minnesota: University of Minnesota Press. p79

²³ Wang, Qiyun and Woo, Huay Lit. "Comparing asynchronous online discussions and face-to-face discussions in a classroom setting." British Journal of Educational Technology. Vol. 38, No 2. 2007. Pp 272-286.

²⁴ Metzger, Miriam and Flanagin, Andrew. 2007. Digital Media, Youth, and Credibility. Boston: MIT Press. pp164-170

²⁵ Greenberg, Eric and Weber, Karl. Generation We: How Millennial Youth Are Taking Over America and Changing Our World Forever. Pachatusan. 2008.

²⁶ Kick, Fran. 2005. What Makes Kids Kick. New York: Instruction_Design Concepts. pp 104-109