

Today's Student and Virtual Schooling: The Reality, the Challenges, the Promise...

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Introduction

In 2008 I was approached to deliver a keynote address at the biennial conference of the Distance Education Association of New Zealand (DEANZ) in Wellington on the topic of today's student and K–12 distance education. Several months ago, Mark Nichols asked me if I would be interested in putting some of the ideas that I discussed as a part of that August 2008 presentation into a manuscript for the *Journal of Distance Learning*. This paper represents my best efforts to summarise and expand on those ideas.

As in my 2008 keynote, I want to discuss three main themes in this paper. The first is to critically examine the common labels we assign to this generation of students and the characteristics these labels attribute to the youth we find in our schools, colleges, and universities. This examination includes the literature and research, (or lack thereof) to support these labels. The second is to trace the substantial history of distance education at the K–12 level. This history begins with the use of the correspondence model and continues with current online learning initiatives. The third and final purpose is to describe the virtual school movement, with a focus on developments in North America. This description also includes a discussion of how virtual schools have been organised and the nature of students served.

The nature of today's student

There has been much written about the nature of this generation of students, both in the popular media and in the academic literature. They have been called *Generation Y*, *Echo*, *Net Generation*, *Neomillennials*, *Generation NeXt*,

Millennials, Generation Me, Digital Natives, Generation txt and so on. Each of these generational labels has a prescribed set of (often contradictory) characteristics. However, before we explore some of these labels it is worth examining the notion of generational differences.

Generational differences are based on the theory that people born approximately within a 20-year time period share a common set of characteristics based upon the historical experiences, economic and social conditions, technological advances, and other societal changes they have in common. If we examine the past century, the commonly accepted generations (although some may have slightly different names for them) are:

- *GI Generation (Greatest Generation)*: born between 1901 and 1924
- *Silent Generation*: born between 1925 and 1945
- *Baby Boomers*: born between 1946 and 1964
- *Generation X*: born between 1965 and 1980
- *Today's student*: born between 1981 and 2000.

For example, the civil rights movement and the sexual revolution, along with the events of the Cold War, the various milestones in space travel, and the assassinations of numerous inspirational leaders probably influenced those who would be identified as Baby Boomers in the United States. According to Lancaster and Stillman (2002) those born on the edges of two generations are often referred to as *cuspers*, and may take the characteristics of either generation depending on their experiences.

When considering today's students, it is important to note that one of the reasons we place so much attention on this group of individuals is their size. In 2005, this generation numbered approximately 60 million in the United States, making them the largest group since the Baby Boomers (who number 72 million) and three times larger than Generation X. At that time, this generation of students made up 37 percent of the population of the United States, and the teen population was growing at twice the rate of the rest of America. As such, this generation of students has the potential to have a great impact on society—from their involvement in the community to their purchasing power to their employment expectations.

In examining these generational labels, we find that three labels have been most prevalent in the media and literature: Net Generation, Millennials, and Digital Natives. The Net Generation was a label first used by Don Tapscott in his book *Growing Up Digital: The Rise of the Net Generation*. Tapscott

(1997) believed this Net Generation comprised children of Baby Boomers, and that digital technology has had a profound impact on their personalities, including their attitudes and approach to learning. Essentially, he believes that the *generation gap* has become a *generation lap*—at least in relation to technology—and this generational lap has made this generation of students profoundly different from any other. In the opening pages of his book, Tapscott writes “the research team collaborated with several hundred children and adults located on six continents.... [and] the main reference source was the Web” (p. viii). In his acknowledgements, he indicated that, “the research team... held discussions on the Net with about 300 youngsters” (p. xi). This is the only information provided about the methodology he used in crafting his vision of this generation.

The difficulty with this methodology is twofold: there is not enough detail provided to understand whether it was reliable or valid, and the sample came primarily from those who were engaged in the medium that features prominently in Tapscott’s generational label. One wonders if his findings were a self-fulfilling prophecy—youth *found* on the internet, and who have grown up using technology all of their lives, were found to be strongly influenced by technology and the internet. If his sample had focused on youth and adults in rural and remote areas where access to digital technology and the internet is not as common, would his characteristics of this generation of youth be the same? In his follow-up book, *Grown Up Digital: How the Net Generation is Changing Your World*, Tapscott (2009) again employed an online questionnaire, a Facebook group, and a global online network with an international sample in the thousands, a strategy that raises similar concerns.

The Millennials generational label appears to be the most common within the literature (Howe & Strauss, 2000). Millennials are described as “more numerous, more affluent, better educated, and more ethnically diverse.... they are beginning to manifest a wide array of positive social habits.... [such as] teamwork, achievement, modesty, and good conduct” (p. 4). The problem with this optimistic generational label is again the methodology that was used. As they described on their website (see <http://millenialsrising.com>), the authors surveyed 202 teachers and 655 students from the class of 2000 in Fairfax County, Virginia. Fairfax County is an affluent suburb of Washington, DC. It has a median household income almost twice the national average; only a third of the student population studied was non-white, 18 percent of students qualified for free or reduced-lunch, and 5 percent lived below the official poverty line. I wonder if the authors would have found the same generational characteristics if their sample had been from Detroit, where over 80 percent

of the population is black, over 20 percent live under the poverty line, and the on-time graduation rate is approximately 25 percent.

Probably the most familiar term among those involved in the K–12 environment is Digital Natives. According to Prensky (2001), Digital Natives “are all ‘native speakers’ of the digital language of computers, video games and the internet” (¶ 5); those of us who are not native to this digital language are considered Digital Immigrants. Of all of the generational labels this is probably the most dangerous, as it presumes a negative connotation towards Digital Immigrants that Prensky himself fosters, “If Digital Immigrant educators really want to reach Digital Natives—i.e., all their students—they will have to change” (Prensky, 2001, ¶ 34). Those educators who do not are “just dumb (and lazy)” (¶ 33). Bayne and Ross (2007) elaborated on this negative view of Digital Immigrants by examining the terms used in the Digital Native literature to describe both groups.

Table 1 Terminology used to describe Digital Natives and Digital Immigrants (Bayne & Ross, 2007, p. 2)

Digital Native	Digital Immigrant
Student	Teacher
Fast	Slow
Young	Old
Future	Past or legacy
Multi-tasking	Logical, serial thinking
Image	Text
Playful	Serious
Looking forward	Looking backward
Digital	Analogue
Action	Knowledge
Constant connection	Isolation

Unfortunately, like Tapscott’s conclusions, Prensky’s work is simply based upon his own, unsystematic observations. I should note that McKenzie (2007) does an excellent job of examining the ‘research’ (and I use that term extremely lightly) that Prensky uses to support his Digital Natives–Digital Immigrants dichotomy.

One of the common themes that you should have noticed is the lack of reliable and valid research to support any of these generational labels—or at least the most common ones. In their funded literature review of how generational differences might affect the instructional design process, Reeves and Oh (2008) concluded, “the bottom line on generational differences is that educational technology researchers should treat this variable as failing to

meet the rigour of definition and measurement required for robust individual difference variables” (p. 302). This finding is also consistent with many of the characteristics attributed to this generation of students by these various labels, such as this generation mistakenly being labelled as master multi-taskers (see Just, Kellera & Cynkara, 2008; Naveh-Benjamin, Kilb & Fisher, 2006; as recent examples that have failed to confirm this myth).

Reeves and Oh (2008) did describe one line of research into generational differences that they found to be “more rigorous” and “convincing”—the Generation Me work completed by Jean Twenge. Based on data collected from 1.3 million young Americans, Twenge (2006) used results from twelve studies dating back to the 1950s to trace the changes in narcissistic beliefs and behaviour over the past 6 decades. On the book jacket, *Generation Me* is described thus, “Today’s young people have been raised to aim for the stars at a time when it is more difficult than ever to get into college, find a good job, and afford a house. Their expectations are very high just as the world is becoming more competitive, so there’s a huge clash between their expectations and reality.” In a more recent article for *Medical Education*, Twenge (2009) indicated that Generation Me students were too ambitious, overconfident, self-centred, lacked empathy for others, entitled, and lacked self-reliance. This is not necessarily the same rosy picture as that portrayed by Tapscott, Prensky, or Howe and Strauss.

Based upon this review of generational differences, the commonly used labels of Net Generation, Millennials, and Digital Natives are based on no or flawed research (and for a more provocative review of the generational differences literature, see Reeves, 2008). When we examine many of the characteristics these labels prescribe to this generation of students (e.g., the fact that they are master multi-taskers), we find the current research supports the exact opposite. In fact, the only thing we can say about this generation of students—that is at least based upon reliable and valid research—is that they are more narcissistic than any previous generation.

Now that we have a better idea of the nature of the students that populate the present K–12 environment, let’s shift our attention to how distance education has been used at the K–12 level.

The history of K–12 distance education

In general terms, the development of distance education has gone through five main phases, at least in terms of the dominant technology that has been used for delivery. This is also true of distance education at the K–12

level. Correspondence education was first used at the K–12 level by the Calvert School of Baltimore in 1906 (Moore & Kearsley, 1996), followed by the Canadian province of British Columbia in 1919 (Dunae, 2006). Shortly after, K–12 jurisdictions also began to experiment with educational radio as a method of distance education delivery. At its peak, radio was used extensively in the mid-Western portion of the United States—beginning in Ohio in 1929 and Wisconsin in 1930 (Clark, 2003), and most extensively in Australia with the School from the Air (Moore & Kearsley, 1996). Several decades later, the K–12 community began using instructional television; for example, in 1961 the United States with the Midwest Program on Airborne Television Instruction (Clark, 2003).

In the late 1970s and early 1980s, audiographics (or telematics) began to appear in some K–12 jurisdictions. This model was primarily used in Australia (Oliver & Reeves, 1994), and extensively in Canada (e.g., Brown, Sheppard, & Stevens, 2000). In many respects the lessons learned from the delivery of distance education to rural K–12 students using audiographics systems formed the basis of the web-based or online learning programme that was to follow (see Barbour, 2005a for an example of this transition). These online learning programmes, at least in North America, have become organised into virtual or cyber schools in the past 2 decades.

The virtual school movement

The organisation of online learning programmes into single entities or schools that provide supplemental or full-time online studies is largely a North American phenomenon (Powell & Patrick, 2006). This is not to say that there are not K–12 online learning initiatives outside of North America. In their survey of over 30 different countries, the International Council for K–12 Online Learning (iNACOL) (2008) found that many countries had K–12 online learning programmes, and that some were quite extensive. In Singapore, for example, online and blended learning was so pervasive that teaching in online and virtual environments was a required course in their teacher education programmes. In Turkey, the government began a pilot programme in 2005–2006 that saw 300,000 K–12 students take an online course, and it was planned to have all 12,000,000 students taking online courses by 2010. In New Zealand, the Virtual Learning Network (VLN) has supported the development of a series of regional programmes that use synchronous video conferencing and asynchronous web-based material to deliver K–12 online learning.

K–12 online learning is also present in other countries; for example, Powell and Patrick (2006) also found that less than 1 percent of K–12 students were enrolled in an online course in China—this may seem like a small amount, but when the total number of K–12 students are taken into consideration it represents a significant number. There were many private companies offering Ministry of Education approved courses in Iran; and there was a single correspondence school offering online courses in Japan. Clark (2007) referenced two United Kingdom initiatives: the National Academy for Gifted and Talented Youth, which offered some online courses; and A School Without Walls, which offered A level and GCSE courses, primarily to adults. My own research for the 2008 keynote revealed the Virtual School for the Gifted and the Virtual Schooling Service in Australia, and a small national virtual school in Finland. However, none of these other programmes resemble the organisational structure of a traditional school (with the possible exception of the individual regional VLN networks) that can be found in Canada and the United States.

K–12 online learning or virtual schooling began in Canada in the province of British Columbia, with the creation of New Directions in Distance Learning (Dallas, 1999) and the EBUS Academy (see <http://www.ebus.ca>) in Vanderhoof around 1993. Other provinces soon followed, as school and district-based programmes were developed. Within the Canadian context, all of these virtual schools are either public or private. Most provide only supplemental online learning opportunities (i.e., students are enrolled in a traditional school, and enrol in one or more online courses to supplement their curricular opportunities), although a small number allow students to enrol in these online schools full time. These online schools have a variety of names, such as *virtual schools*, *cyber schools*, *internet high schools*—none of which carry any specific connotation. Barbour and Stewart (2008) report that there was some form of K–12 online learning in all 13 provinces and territories, although it was much more extensive in some jurisdictions than others.

Within the United States, the initial development of virtual schooling occurred primarily as a result of state initiatives. For example, the State of Utah created their e-School in 1994 (Clark, 2003). In the United States there is a very clear distinction between virtual schools and cyber schools. Virtual schools are primarily supplemental programmes that are typically district-based, consortium, or state-wide programmes. Cyber schools, on the other hand, are typically full-time programmes, often created under charter school legislation (which allows a group to create a school based upon a specific thematic or ideological written document or charter). The growth of K–12 online learning

in the United States has been exponential. Clark (2001) estimated that there were between 40,000 and 50,000 virtual school enrolments: 6 years later Picciano and Seaman (2007) indicated that there were approximately 700,000 students enrolled in online courses. Watson, Gemin, and Ryan (2008) reported significant online learning activity in 44 states.

Mexico's K–12 online learning is less extensive than that in its two northern neighbours—Canada and the United States. At present, there are at least nine distance education high schools operated by universities that have grown out of *telesecundaria* or the television-based high-school programme for rural areas that could not support high-school teachers (C. Cavanaugh, personal communication, May 6, 2008). The main focus of these distance programmes is to help adults finish high school. Because internet access is not universal, these programmes use educational radio, satellite delivery, DVDs, online media, mobile phones, and even correspondence education to deliver their programmes. Currently these programmes are relatively small, but the university consortiums are rapidly growing with an increased importance being placed on education within the country.

How does virtual schooling work?

During my 2008 keynote, I was able to provide a series of screen captures and videos to illustrate how virtual schooling worked. This print format limits my ability to use the same resources. Therefore, in examining what virtual schooling looks like from the student perspective, I will provide extensive quotations from an article I co-authored (Barbour & Reeves, 2009). Note that a description of *virtual schooling* is different from a description of *cyber schooling*, at least in the American context where each term describes a different type of K–12 online learning.

Cyber schooling is often associated with the homeschooling movement in the United States—although, in legislative terms, the two terms have very different meanings. Students in these cyber schools are not enrolled in a brick-and-mortar school, and take all of their schooling via the online learning programme (usually at home). These students are similar to students enrolled in a traditional correspondence course, but computers mediate the experience. Greenway and Vanourek (2006) described the experience of one sixth-grade cyber school student:

In a 'typical' day, a student might take mostly core courses with some electives and log on to the computer for an hour or two, clicking through interactive lessons with text, audio or video clips, Flash animation, and links to related sites; completing an online math quiz; emailing

the teacher; and ‘chatting’ with classmates online. Students complete the majority of their work offline in many of these online schools, for example, reading assignments, drafting an essay, conducting an experiment with school-supplied materials, and studying for an exam.... A parent or other responsible adult is asked to supervise—and sometimes to assist with instruction and motivation, all under the direction of a licensed teacher. (¶ 17)

In the cyber-school model, the cyber school provides the online materials used by the student. There is an expectation that the parent is the primary ‘teacher’ (i.e., this was the main issue in a successful lawsuit brought against this method of delivery in Wisconsin in 2008), and the cyber-school teacher is largely a curricular help desk and grader. This practice allows cyber schools to maintain a student–teacher ratio that is two to three times that in virtual schools and traditional brick-and-mortar schools.

Virtual schooling uses a combination of asynchronous and synchronous delivery models. In Barbour and Reeves (2009), we described the asynchronous model:

The asynchronous method of delivery is more common among the statewide virtual schools throughout the United States. For example, in describing how a student would take a course through the FLVS [Florida Virtual School], Friend and Johnston (2005) described how the students would interact with online curriculum... and providing them with choice in the resources that they use and how they demonstrate a mastery of the content. After the student has finished interacting with the curriculum, the students turn in assignments, and the teacher gives written feedback in the electronic course room or phones to discuss ways the student [sic] can improve performance’ (p. 109).

This was consistent with the description provided by Zucker and Kozma (2003), who described a student experience in a Bioethics course offered through the VHS [Virtual High School Global Consortium]. A student would enter their online course where the student is presented with a photo of the teacher, possibly photos of other students, the course syllabus and a course calendar. The student would use the syllabus, calendar, other web-based material, and interaction with their teacher to determine the specific reading assignments and written work to be completed each week. Using the course content and their textbook, if there is one for the course, the student would work through the material and complete the written

work—which would be submitted to the teacher for written feedback delivered to the student through the course management system. (p. 406)

While this asynchronous model for virtual schooling is the dominant method of delivery in the United States, some programmes there (and many more in Canada¹) also use synchronous delivery. Again, in Barbour and Reeves (2009) we described:

A good example of a synchronous learning environment is provided by Murphy and Coffin (2003), “when students first enter the virtual classroom, they have access to DM [direct messaging] and hand raising. Access to other tools, such as the microphone or the WB [whiteboard], must be assigned by the teacher” (p. 236). Using these tools, the teacher can lead a traditional lecture, using slides on the whiteboard to guide their thoughts or as notes for the student. In his dissertation examining social presence with web-based instructors who taught in a combination synchronous and asynchronous environment, Nippard (2005) described many of the different kinds of interaction that would be expected from a traditional classroom, with the teacher presenting the content in a lecture-style with notes or worked examples on the whiteboard and students asking their teachers questions using both the audio and text-based communication tools based on their presentation of the content. (p. 406)

Let me underscore the fact that the asynchronous delivery model is used by most virtual schools in the United States. These programmes use synchronous instruction mainly in second-language courses or as supplemental tutorial sessions outside the traditional school day. Within Canada, some provinces make extensive use of synchronous instruction, while others rely almost exclusively on asynchronous instruction.

Regardless of the delivery model(s) used by the virtual school, in my own research I have found that virtual school teachers tend to be much better synchronous teachers than asynchronous teachers (see Barbour, 2008a; 2008b). One of the reasons virtual school teachers may be more effective in the synchronous environment is the similarity with the traditional classroom environment. Essentially, the synchronous environment allows these virtual school teachers to use many of the same teaching strategies in the virtual classroom that they would use in the face-to-face classroom. In programmes

¹ Canadian virtual schools are able to offer more synchronous delivery because their education is controlled at the provincial level, in comparison with the United States where education is controlled at the local level.

where teachers use both synchronous and asynchronous instruction, virtual school teachers have readily adopted the synchronous tools because they are consistent with what they already know, believe, and do in their traditional classrooms (Rogers, 2003).

In terms of programmes that rely exclusively or primarily on asynchronous instruction, the quality of teaching varies significantly. This would be consistent with the traditional classroom, where we find some really good teachers and some really bad teachers. One of the more troubling findings related to asynchronous instruction in these virtual schools is the lack of actual teaching that occurs. In many programmes, the delivery model focuses on providing online course content that the students are expected to read through or interact with, followed by activities that the students must complete and/or a mandatory online discussion that they must participate in. To make a comparison with the traditional classroom, this delivery model would be similar to providing the student with an interactive textbook, having them complete a series of questions or problems from that textbook, and perhaps expecting them to speak once or twice in a group discussion at the end of the process.

Another troubling aspect is the almost total lack of literature related to the design and delivery of asynchronous content that exists for the K–12 environment. Barbour and Cooze (see Barbour, 2005b; 2005c; 2007; Barbour & Cooze, 2004; Cooze & Barbour, 2005; 2007) have examined what constitutes effective asynchronous course content design for K–12 learners. However, this line of inquiry has focused almost exclusively upon a single virtual school, and primarily on the views of teachers and course developers (with little input from students or verification of the perceived effectiveness). Similarly, DiPietro et al. (2008) reported a series of best practices of asynchronous teaching that were based solely on the perceptions of virtual school teachers at a single United States virtual school, again without verification of the effectiveness of teachers' perceptions.

In 2008, iNACOL conducted a review of published standards of K–12 teaching online that resulted in the release of the *National Standards for Quality Online Teaching* (see iNACOL, 2008). These standards were adopted after a review of a series of other standards. With the exception of the Electronic Classroom of Tomorrow's *Teacher Evaluation Rubric*, none of the standards reviewed were based on published research (including the ones eventually adopted by iNACOL as their national standards). Unfortunately, university-based teacher education programmes have only begun to include online

teaching pedagogy in their courses in the past 3 or 4 years (and only a select few have been at the forefront in filling this gap in pre-service and in-service teacher training).

This is not to say that there are no effective virtual school teachers, or that all virtual school teachers struggle with teaching in an asynchronous environment. Recent research conducted by Archambault and Crippen (2009) found that, as a group, virtual school teachers were more experienced, better educated, and more technically savvy than the average classroom teacher. This would seem to indicate that while there is a lack of research and literature to support their practices, many of these seasoned teachers have been able to draw on their formal and informal training, along with years of classroom practice, to provide virtual school students with a quality online learning experience. To test this belief, however, we need to examine how virtual students actually perform compared with their classroom counterparts.

Is virtual schooling effective?

The literature on student performance of virtual school students compared with classroom-based students has been primarily one sided. If we examine the literature chronologically, Bigbie and McCarroll (2000) report that over half of the students who completed FLVS courses scored an A in their course and only 7 percent received a failing grade. Similarly, Cavanaugh (2001) found that there was “a small positive effect in favor of distance education” at the K–12 level (p. 73). Barker and Wendel (2001) found that students in the six virtual schools in three different Canadian provinces performed no worse than the students from the three conventional schools. Barbour and Mulcahy (2008; 2009) found that over a 5-year period with more than 200,000 cases, students enrolled in the Centre for Distance Learning and Innovation (that is, in the provincial virtual school in Newfoundland and Labrador) performed as well as classroom-based students on final course scores and exam marks. Many others have reached similar conclusions in the intervening years (see Cavanaugh et al., 2004; 2005; Clark et al., 2002; Elluminate, 2006; McLeod et al., 2005).

In almost all of the available literature on student performance, students enrolled in virtual school courses do as well or better than their classroom counterparts. However, we should examine the nature of some of these studies a little further. For example, Ballas and Belyk (2000) reported that participation rates in the assessment among virtual students ranged from 65 percent to 75 percent, compared with 90 percent to 96 percent for the classroom-based students in their study. Bigbie and McCarroll (2000) reported that between 25 percent and 50 percent of students had dropped out of their

FLVS courses over the previous 2-year period, indicating that end-of-year assessments or overall course scores did not include one-fifth to half of the students who were initially enrolled in the course. McLeod et al. (2005) were even more direct when they stated they believed the student performance results were due to the high dropout rate in virtual school courses. Similarly, Cavanaugh et al. (2005) speculated that the virtual school students who did take the assessment may have been more academically motivated and naturally higher achieving students. Essentially, these authors have raised concerns that many of the lower performing students had either dropped out of their virtual school courses or failed to complete non-mandatory assessments. In effect, these studies of student performance did not compare comparable groups of students.

The nature of virtual school students therefore has to be examined even further. In the first-year evaluation of the VHS, Kozma, Zucker, and Espinoza (1998) found that the vast majority of students in their courses were planning to attend a 4-year college. In their second-year evaluation, Espinoza et al. (1999) found that “VHS courses [were] predominantly designated as ‘honors’, and students enrolled are mostly college bound” (p. 49). Similarly, Watkins (2005) reported that 45 percent of the students who participated in e-learning opportunities in Michigan were “either advanced placement or academically advanced” students (p. 37).

In addition to the selective nature of the students in terms of their average performance and their higher education aspirations, the literature has also been quite clear about the characteristics of most virtual school students. Haughey and Muirhead (1999) described the preferred characteristics of virtual school students as including the highly motivated, self-directed, self-disciplined, independent learner who could read and write well, and who also had a strong interest in or ability with technology. Roblyer and Elbaum (2000) indicated that “only students with a high need to control and structure their own learning may choose distance formats freely” (p. 61). Finally, Clark et al. (2002) found that IVHS students were “highly motivated, high achieving, self-directed and/or who liked to work independently” (p. 41). Simply put, the literature indicates that the sample of virtual school students is skewed even more to the higher performing student.

However, in this instance the literature may not provide a complete picture of the virtual school landscape. For example, in her opening remarks to the 2007 annual *Virtual School Symposium*, Susan Patrick explained that the two courses with the highest enrolment of online students in the United States

were Algebra I and Algebra II. These mathematics courses are usually taken in the first year of high school, and many of the online students enrolled in these courses are taking the course for the second or third time. Watson et al. (2008) indicated that the largest growth in K–12 online learning enrolment is in the full-time cyber schools, and both Watson et al. and Klein (2006) indicate that many cyber schools have a higher percentage of students classified as ‘at-risk’. Rapp, Eckes, and Plurker (2006) described at-risk students as those who might otherwise drop out of traditional schools. Concerns or issues that students have with their teachers and courses (such as organisation, lessons, assignments, and grading) have the potential to create roadblocks to success. While the report *Charter Schools in Eight States: Effects on Achievement, Attainment, Integration, and Competition* reports that “virtual [cyber] charter middle schools lag substantially behind classroom-based charter middle schools” (Zimmer, 2009, pp. 40–41), it also cautions against drawing conclusions because many of those included in the comparison “may be students who are especially likely to have experienced an event producing a decline in their expected future achievement” (p. 41). These events cause the kind of roadblocks described by Rapp and her colleagues.

The majority of the literature may portray K–12 online learners as being primarily highly motivated, self-directed, self-disciplined, independent learners who read and write well, and who have a strong interest in or ability with technology. However, this is clearly not an accurate description of the entire or possibly even the majority of students attending virtual schools and, particularly, cyber schools. Clearly, as Scherer (2006) indicated in her discussion of the research on student issues related to virtual schooling, “the sample of students needs to be broadened to determine if these findings hold true for a greater number of students...” (p. 19).

Concluding thoughts

While distance education at the K–12 level has been around for over a century, the use of online learning in K–12 environments and the organisation of these programmes into formal entities are still quite new. In North America, virtual schooling has been a reality for only about 15 years, and it is less in many other jurisdictions. There is therefore still much that we don’t know about this form of distance education with this population of students. Having said that, as the percentage of K–12 students enrolled in online learning continues to grow, and as the population of students who access these opportunities continues to expand, more is needed to prepare both students and teachers to be successful in these environments.

Teacher preparation programmes need to incorporate curriculum and practicum/internship opportunities for pre-service and in-service teachers. Initiatives such as the Teacher Education Goes into Virtual Schooling (TEGIVS) programme at Iowa State University (see <http://www.public.iastate.edu/~vschool/TEGIVS/homepage.html>) need to be the rule for pre-service programmes rather than the exception. For in-service teachers, more focused programmes such as the Certificate in Online Teaching and Learning at the University of Florida (see <http://www.distancelearning.ufl.edu/program.aspx?p=39>) or the Certificate in Online Teaching from Boise State University (see http://edtech.boisestate.edu/web/online_teach_cert.htm) need to be made available. Initiatives such as these will improve both the design and delivery of online courses and how school-based teachers support students who are engaged in online learning.

For students, we need to gain a better understanding of the skills necessary for adolescent learners to be successful in a largely independent, technology-mediated environment—and then figure out ways to provide students with those skills before they are placed in the online learning environment. As states like Michigan, New Mexico, Alabama, and others begin to require students to take an online course or have an online learning experience in order to graduate from high school, preparing students to be successful in this kind of environment will be critical.

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References

- Archambault, L., & Crippen, K. (2009). Examining TPACK among k–12 online distance educators in the United States. *Contemporary Issues in Technology and Teacher Education*, 9(1), 71–88.
- Ballas, F. A., & Belyk, D. (2000). *Student achievement and performance levels in online education research study*. Red Deer, AB: Schollie Research & Consulting. Retrieved July 31, 2005 from http://web.archive.org/web/20051031044348/http://www.ataoc.ca/files/pdf/AOCresearch_full_report.pdf

- Barbour, M. K. (2005a). From telematics to web-based: The progression of distance education in Newfoundland and Labrador. *British Journal of Educational Technology*, 36(6), 1055–1058.
- Barbour, M. K. (2005b). Perceptions of effective web-based design for secondary school students: A narrative analysis of previously collected data. *Morning Watch*, 32(3–4). Retrieved November 4, 2005 from <http://www.mun.ca/educ/faculty/mwatch/win05/Barbour.htm>
- Barbour, M. K. (2005c). The design of web-based courses for secondary students. *Journal of Distance Learning*, 9(1), 27–36.
- Barbour, M. K. (2007). Principles of effective web-based content for secondary school students: Teacher and developer perceptions. *Journal of Distance Education*, 21(3), 93–114. Retrieved June 8, 2007 from <http://www.jofde.ca/index.php/jde/article/view/30>
- Barbour, M. K. (2008a). Useful and challenging characteristics of virtual schooling: Secondary student experiences. *Quarterly Review of Distance Education*, 4(9), 357–372.
- Barbour, M. K. (2008b). What are they doing and how are they doing it? Rural student experiences in virtual schooling. *Proceedings of the World Conference on E-Learning in Corporate, Government, Healthcare and Higher Education* (2496–2503). Norfolk, VA: AACE.
- Barbour, M. K., & Cooze, M. (2004). All for one and one for all: Designing web-based courses for students based upon individual learning styles. *Staff and Educational Development International*, 8(2/3), 95–108.
- Barbour, M. K., & Mulcahy, D. (2008). How are they doing? Examining student achievement in virtual schooling. *Education in Rural Australia*, 18(2), 63–74.
- Barbour, M. K., & Mulcahy, D. (2009). Student performance in virtual schooling: Looking beyond the numbers. *ERS Spectrum*, 27(1), 23–30.
- Barbour, M. K., & Reeves, T. C. (2009). The reality of virtual schools: A review of the literature. *Computers and Education*, 52(2), 402–416.
- Barbour, M. K., & Stewart, R. (2008). *A snapshot state of the nation study: K–12 online learning in Canada*. Vienna, VA: North American Council for Online Learning. Retrieved on January 21, 2009 from http://inacol.org/resources/docs/NACOL_CanadaStudy-lr.pdf

- Barker, K., & Wendel, T. (2001). *E-learning: Studying Canada's virtual secondary schools*. Kelowna, BC: Society for the Advancement of Excellence in Education. Retrieved July 31, 2005 from http://www.sae.ca/index.php?option=com_content&task=view&id=145&Itemid=57
- Bayne S. & Ross, J. (2007, December). *The 'digital native' and 'digital immigrant': A dangerous opposition*. Paper presented at the Annual Conference of the Society for Research into Higher Education, Brighton, UK. Retrieved on May 13, 2009 from http://www.malts.ed.ac.uk/staff/sian/natives_final.pdf
- Bigbie, C., & McCarroll, W. (2000). *The Florida high school evaluation 1999–2000 report*. Tallahassee, FL: Florida State University. Retrieved February 25, 2007 from http://www.flvs.net/educators/documents/pdf/archived_evals/FLVS%20Annual%20Evaluations/99-2000/99-2000%20Year%20End%20Evaluation.pdf
- Brown, J., Sheppard, B., & Stevens, K. (2000). *Effective schooling in a telelearning environment*. St. John's, NL: Centre for TeleLearning and Rural Education. Retrieved July 13, 2004 from http://web.archive.org/web/20041027051254/http://www.tellearn.mun.ca/es_report/index.html
- Cavanaugh, C. (2001). The effectiveness of interactive distance education technologies in K–12 learning: A meta-analysis. *International Journal of Educational Telecommunications*, 7(1), 73–88.
- Cavanaugh, C., Gillan, K. J., Kromrey, J., Hess, M., & Blomeyer, R. (2004). *The effects of distance education on k–12 student outcomes: A meta-analysis*. Naperville, IL: Learning Point Associates. Retrieved July 4, 2005, from <http://www.ncrel.org/tech/distance/k12distance.pdf>
- Cavanaugh, C., Gillan, K. J., Bosnick, J., Hess, M., & Scott, H. (2005). *Succeeding at the gateway: Secondary algebra learning in the virtual school*. Jacksonville, FL: University of North Florida.
- Clark, T. (2001). *Virtual schools: Trends and issues—A study of virtual schools in the United States*. San Francisco, CA: Western Regional Educational Laboratories. Retrieved July 4, 2005 from http://www.wested.org/online_pubs/virtualschools.pdf
- Clark, T. (2003). Virtual and distance education in American schools. In M. G. M. W. G. Anderson (Ed.), *Handbook of distance education* (pp. 673–699). Mahwah, NJ: Lawrence Erlbaum Associates.

- Clark, T. (2007). Virtual and distance education in North American schools. In M. G. Moore (Ed.), *Handbook of distance education* (2nd ed., pp. 473–490). Mahwah, NJ: Lawrence Erlbaum Associates.
- Clark, T., Lewis, E., Oyer, E., & Schreiber, J. (2002). *Illinois Virtual High School evaluation, 2001–2002*. Carbondale, IL: TA Consulting and Southern Illinois University. Retrieved July 4, 2005 from http://www2.imsa.edu/programs/ivhs/pdfs/IVHS_FinalRpt.pdf
- Cooze, M., & Barbour, M. K. (2005). Learning styles: A focus upon e-learning practices and pedagogy and their implications for success in secondary high school students in Newfoundland and Labrador. *Malaysian Online Journal of Instructional Technology*, 2(1).
- Cooze, M., & Barbour, M. K. (2007). Learning styles: A focus upon e-learning practices and pedagogy and their implications for successful instructional design. *Journal of Applied Educational Technology*, 4(1). Retrieved July 2, 2007 from http://www.eduquery.com/jaet/JAET4-1_Cooze.pdf
- Dallas, J. (1999). *Distance education for kindergarten to grade 12: A Canadian perspective*. Presentation at the Pan-Commonwealth Forum, Brunei. Retrieved January 27, 2009 from <http://www.col.org/forum/PCFpapers/PostWork/dallas.pdf>
- DiPietro, M., Ferdig, R. E., Black, E. W. & Preston, M. (2008). Best practices in teaching k–12 online: Lessons learned from Michigan Virtual School teachers. *Journal of Interactive Online Learning*, 7(1). Retrieved August 11, 2008 from <http://www.ncolr.org/jiol/issues/getfile.cfm?volID=7&IssueID=22&ArticleID=113>
- Dunae, P. A. (2006). *The homeroom: Correspondence education*. Nanaimo, BC: Malaspina University. Retrieved July 24, 2006 from <http://www.mala.bc.ca/homeroom/content/topics/programs/corresp.htm>
- Illuminate Inc. (2006). *The impact of synchronous online learning in academic institutions: Customer experiences from k12 and higher education*. Calgary, AB: Author. Retrieved August 22, 2006 from http://www.inacol.org/resources/docs/impact_online_learning.pdf
- Espinoza, C., Dove, T., Zucker, A., & Kozma, R. (1999). *An evaluation of the Virtual High School after two years in operation*. Arlington, VA: SRI International. Retrieved July 31, 2005 from <http://ctl.sri.com/publications/downloads/evalvhs2yrs.pdf>

- Greenway, R., & Vanourek, G. (2006). The virtual revolution: Understanding online schools. *Education Next* (2). Retrieved September 12, 2006 from <http://www.hoover.org/publications/ednext/3210506.html>
- Haughey, M., & Muirhead, W. (1999). *On-line learning: Best practices for Alberta school jurisdictions*. Edmonton, AB: Government of Alberta. Retrieved July 31, 2005 from http://www.phrd.ab.ca/technology/best_practices/on-line-learning.pdf
- Howe, N., & Strauss, W. (2000). *Millennials rising: The next great generation*. New York: Vintage Books.
- International Council for K–12 Online Learning. (2008). *National standards for quality online teaching*. Vienna, VA: Authors. Retrieved August 27, 2008 from <http://www.inacol.org/resources/nationalstandards/NACOL%20Standards%20Quality%20Online%20Teaching.pdf>
- Just, M. A., Kellera, T. A., & Cynkara, J. (2008). A decrease in brain activation associated with driving when listening to someone speak. *Brain Research*, 1205, 70–80.
- Klein, C. (2006). *Virtual charter schools and home schooling*. Youngston, NY: Cambria Press.
- Kozma, R., Zucker, A., & Espinoza, C. (1998). *An evaluation of the Virtual High School after one year in operation*. Arlington, VA: SRI International. Retrieved July 31, 2005 from <http://ctl.sri.com/publications/downloads/evalvhs1yr.pdf>
- Lancaster, L. C., & Stillman, D. (2002). *When generations collide. Who they are. Why they clash. How to solve the generational puzzle at work*. New York: Collins Business.
- McKenzie, J. (2007). Digital nativism: Digital delusions and digital deprivation. *From Now On*, 17(2). Retrieved on May 3, 2008 from <http://fno.org/nov07/nativism.html>
- McLeod, S., Hughes, J. E., Brown, R., Choi, J., & Maeda, Y. (2005). *Algebra achievement in virtual and traditional schools*. Naperville, IL: Learning Point Associates.
- Moore, M. G. & Kearsley, G. (1996). *Distance education: A systems view*. Belmont, CA: Wadsworth.
- Naveh-Benjamin, M., Kilb, A., & Fisher, T. (2006). Concurrent task effects on memory encoding and retrieval: Further support for an asymmetry. *Memory & Cognition*, 34(1), 90–101.

- Oliver, R., & Reeves, T. C. (1994). *Telematics in rural education: An investigation of the use of telematics for the delivery of specialist programmes for students in rural schools*. Mount Lawley, Australia: InTech Innovations.
- Picciano, A. G., & Seaman, J. (2007). *K–12 online learning: A survey of U.S. school district administrators*. Needham, MA: Alfred P. Sloan Foundation. Retrieved March 8, 2007 from http://www.sloan-c.org/publications/survey/pdf/K-12_Online_Learning.pdf
- Powell, A., & Patrick, S. (2006). *An international perspective of k–12 online learning: A summary of the 2006 NACOL international e-learning survey*. Vienna, VA: North American Council for Online Learning.
- Prensky, M. (2001). Digital natives, digital immigrants—Part II: Do they really think differently? *On the Horizon*, 9(6). Retrieved September 25, 2006 from <http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>
- Rapp, K. E., Eckes, S. E., & Plurker, J. A. (2006). Cyber charter schools in Indiana: Policy implications of the current statutory language. *Education Policy Brief*, 4(3). Retrieved January 16, 2009 from http://ceep.indiana.edu/projects/PDF/PB_V4N3_Winter_2006_CyberCharter.pdf
- Reeves, T. C. (2008, January). *Do generational differences matter in instructional design? Paper presented to the Instructional Technology Forum*. Retrieved May 13, 2009 from <http://it.coe.uga.edu/itforum/Paper104/ReevesITForumJan08.pdf>
- Reeves, T. C., & Oh, E. J. (2008). Generation differences and educational technology research. In J. M. Spector, M. D. Merrill, J. J. G. van Merriënboer, & M. P. Driscoll (Eds.), *Handbook of research on educational communications and technology* (3rd ed., pp. 295–303). Mahwah, NJ: Lawrence Erlbaum Associates.
- Roblyer, M. D., & Elbaum, B. (2000). Virtual learning? Research on virtual high schools. *Learning and Leading with Technology*, 27(4), 58–61.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press: New York, NY.
- Scherer, J. (2006). *Special report: Virtual high schools*. San Diego, CA: Distance-Educator.com.
- Tapscott, D. (1997). *Growing up digital: The rise of the net generation*. New York: McGraw Hill.

- Tapscott, D. (2009). *Grown up digital: How the net generation is changing your world*. New York: McGraw Hill.
- Twenge, J. M. (2006). *Generation me: Why today's young Americans are more confident, assertive, entitled—and more miserable than ever before*. New York: Free Press.
- Twenge, J. M. (2009). Generational changes and their impact in the classroom: Teaching generation me. *Medical Education*, 43(5), 398–405.
- Watkins, T. (2005). *Exploring e-learning reforms for Michigan: The new educational (r)evolution*. Detroit, MI: Wayne State University. Retrieved November 11, 2006 from <http://web.archive.org/web/20051208000848/http://www.coe.wayne.edu/e-learningReport.pdf>
- Watson, J. F., Gemin, B., & Ryan, J. (2008). *Keeping pace with k-12 online learning: A review of state-level policy and practice*. Vienna, VA: North American Council for Online Learning. Retrieved January 2, 2009 from http://www.kpk12.com/downloads/KeepingPace_2008.pdf
- Zimmer, R., Gill, B., Booker, K., Lavertu, S., Sass, T. R., & Witte, J. (2009). *Charter schools in eight states: Effects on achievement, attainment, integration, and competition*. Santa Monica, CA: RAND Corporation.

Biographical note



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