**Student success and the effectiveness of online teaching in K-12 classrooms:**

**An exploratory study**

**Table of Contents:**

1. **Background: My own experience with a DL programme**
2. **Overview**
	1. **Online Learning is an International Phenomenon**
	2. **Little Concrete Research about the Effectiveness on K-12 Virtual Learning**
	3. **The problem of comparing K-12 online learning with adult online learning**
	4. **The results of studies on the effectiveness of K-12 online education**
3. **Moving Forward: Best practices in online teaching**
4. **Afterword: More reflections on my DL experience**
5. **References**

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1. **Background: My own experience with a DL programme**

The question I wish to pursue in this paper has been spurred by my own recent experiences with a commercial distributed learning product which my school management presented to our English department as “the future of education”. The school wanted us to displace one third of our highly successful secondary English language arts curriculum to make room for an online ESL programme called “Englishtown”. The programme is the product of the same company owned by the chairman of our charter school’s board. It claims to be “The World’s #1 online English school” (www.englishtown.com).

Despite the pressure we experienced from the board and our school management, our department felt strongly that this DL programme was the wrong choice for our students. Our department is already offering a thriving “blended learning” environment, where we make regular and enthusiastic use of a broad variety of Web 2.0 technologies in all our English classes, from blogs to webcasting, to voice threads, films, and many kinds of different collaborative writing and editing sites (Weebly, Wikispaces, PB Works, Dropbox and Google Drive are but a few examples). We felt it unnecessary to outsource our teaching to a potentially less innovative and more rigid commercial DL system. Furthermore, my colleagues had been involved in testing a pilot version of this platform two years ago, and it was a disastrous experience and a waste of valuable learning time. Both students and teachers uniformly gave the programme very poor reviews and likened it to working with a boring online textbook. The preferred the regular face to face classes held with our native speaking teachers and requested a return to our more challenging work with literature and academic speaking and writing.

For us, even the “new and improved” Englishtown platform did not meet our students’ particular needs. Despite the fact that our students are viewed through the wide lens of the Swedish curriculum as ESL learners, their English skills are at the uppermost end of this spectrum. Their vocabularies, their ability to use formal language, to analyse, negotiate, instruct, explain and interpret are exceptionally strong. The papers they write for me are a great deal more fluent, expressive, structured and analytical than those I used to meet teaching a regular Canadian gr. 11 English class. My current students crave authentic, academic and challenging course materials, and their goal is to be able to integrate seamlessly into professional and academic life in the English speaking world. Time spent on an online platform like Englishtown might help tweak the occasional grammar problem and would, no doubt, reinforce their sense that they are, for all intents and purposes, as skilled as well-educated native speakers. A DL programme like this removes the wider possibility for them to create, inspire and drive the content of their own English courses the way they can now. It also curtails the amount of real-world literature and media we can integrate into our weekly study, and locks them into a rigid system where they must climb through levels to reach the challenge they need. Englishtown would be a boon to a true ESL learner who needs to do the trench work of grammar, writing and vocabulary-building exercises, and seek out opportunities for more challenging and authentic English interactions which may otherwise be scarce in the culture/location they live in. However, I do not believe this will make any significant difference for my current students who have substantial access to English culture and native English-speaking teachers already.

This experience has caused me to ask many questions about the ethics of commercial DL vendors in schools and use of public money for private purposes, the role of school administrators and the autonomy of subject specialists in choosing DL platforms, and whether or not DL will become the preferred mode of education in the future. Above all, however, I am interested in exploring the question of student achievement in online environments. Englishtown, after all, boasts a “money back learning guarantee”. If students do not achieve learning success by climbing through their certification levels, the programme will give them a refund. Few schools can offer that, now can they? Should I let go of my misgivings about this DL programme and trust that no matter what, my students will achieve their goals? Do students actually achieve higher learning outcomes in distributed learning (online) environments? What does the research say?

1. **Overview**

 **2.1 Online Learning is an International Phenomenon**

At the beginning of their landmark study, Cavanaugh, Gillan, Kromney, Hess and Blomeyer recall that distance learning has been integrated into public education since the 1930’s, when children studied with the use of radio broadcasts (2004). From this point on, distance learning has evolved into a model better known as distributed learning, where TV and videoconferencing, the Internet and Web 2.0 technologies have found their way into brick-and-mortar classrooms, and in other cases have formed the basis of new virtual classrooms. The past decade has witnessed a massive proliferation of online education, especially in the area of adult education (in universities, in the professional world, and through continuing education), but also in the context of K-12 schools. Barbour (2012) notes that virtual or online schooling is a particular phenomenon in North American schools because it offers students in remote rural locations better educational opportunities (Barbour, 2012). Indeed, Patrick and Powell’s 2006 “International Survey of K-12 Online Learning” demonstrates that eLearning is an international phenomenon, occurring throughout both the developed and the developing world in countries like Singapore, Nepal, Australia, Zimbabwe and throughout Europe. In their meta-analysis of the open-source literature about online learning, Cavanaugh, Barbour and Clark (2009) find the following:

In North America and other industrialized countries, distance education for elementary and secondary students is seen as a solution to several educational problems, including crowded schools, a shortage of secondary courses for remedial or accelerated students, a lack of access to qualified teachers in a local school, and the challenge to accommodate students who need to learn at a pace or in a place different from a school classroom (Cavanaugh & Clark, 2007). In less industrialized nations, K-12 online education is seen as a social and economic development strategy (Moore & Kearsley, 2005). Thus, it is clear why K-12 distance education programs are developing rapidly around the world and why growth in K-12 online course enrollments has outstripped that of other educational formats in recent years (Setzer & Lewis, 2005). (Cavanaugh et al., 2009, p. 1)

**2.2 Little Concrete Research regarding the Effectiveness of K-12 Virtual Learning**

Now that more than a decade has passed since the first virtual schools opened, there is still little concrete and specific research comparing the effectiveness of K-12 online education with standard classroom teaching. In their study, Patrick and Powell find that “There are a number of rigorous studies that have examined the question, ‘Is online learning effective?’ However, there is not a single, large-scale, national study comparing students taking online courses with traditional students, using control groups in the instructional design.” (Patrick and Powell, 2009, p.5). They go on to note that when the U.S. Department of Education released their meta-analysis of 51 effectiveness studies and literature reviews of online learning, 44 of these reported on the effectiveness of online learning for older learners. Only 15 of these studies dealt with K-12 learners (Patrik and Powell, 2009, p. 6).

Most published studies and meta-analyses of studies conclude with the same general statements about the lack of specific research into the specific learning results for K-12 students in comparison with standard classroom results. How can we measure the success of online learning? What can we compare it with to establish its relevance and efficacy? In their 2009 meta-analysis of online learning studies, Cavanaugh, Barbour and Clark state that

Much of the published literature is based upon the personal experiences of those involved in the practice of virtual schooling; as well, much of the research is available only in unpublished masters’ theses and doctoral dissertations. In many ways, this is indicative of the foundational descriptive work that often precedes experimentation in any scientific field. In other words, it is important to know how students in virtual schools engage in their learning in this environment prior to conducting any rigorous examination of virtual schooling. (Cavanaugh et al., 2009, p. 2-3).

Cavanaugh et al. go on to identify a wide spectrum of types of online education in K-12 schools. In his 2001 study, Clark established this table of different types of virtual schools:

|  |  |
| --- | --- |
| Table 1 *Clark’s Seven Categories of Virtual Schools*Type  | Description  |
| State-sanctioned, state-level  | Virtual schools operating on a state-wide level, such as the Florida Virtual School  |
| College and university-based  | Independent university high schools or university-sponsored delivery of courses to K-12 students, such as the University of California College Prep Online (UCCP).  |
| Consortium and regionally-based  | Virtual schools operated by a group of schools or school districts, such as the Virtual High School (VHS)  |
| Local education agency-based  | Virtual schools operated by a single school or school district, such as the Gwinnett County Online Campus.  |
| Virtual charter schools  | Virtual schools created under the charter school legislation in many states, such as Connections Academy, also commonly known as cyberschools.  |
| Private virtual schools  | Virtual schools that are operated in the same manner as a brick and mortar private school, such as the Christa McAuliffe Academy.  |
| For-profit providers of curricula, content, tools and infrastructure  | Companies that act as vendors for the delivery of courses or the use of course materials, such as APEX Learning  |

In their analysis of the literature regarding virtual schooling, the authors observe that this field of study is “emerging” and “still in its early stages” (Cavanaugh et al. p.7). Of interest here is also that Cavanaugh et al. go on to state that “the literature has not yet addressed the relative efficacy of teacher-developed, school-developed, and vendor-developed courses.” (2009, p.8) In other words, the research into how well virtual schools and vendor-based education programmes work for K-12 online students is still in its infancy. A vendor-developed DL programme like “Englishtown” can only root its claims of academic success in the marketplace because the research to support the choice of vendor-developed courses has not been published. In their most recent meta-analysis, Cavanaugh et al. urge caution about the “promise” of virtual schooling:

The promise of virtual schooling as the focus of the benefits-related literature was noteworthy because the literature about the advantages of online learning generally was mixed. For example, there was no agreement in the education community or the public that online learning provides high quality learning experiences at any level. Reeves (2003) concluded that there is almost no evidence to support the claim that instructors who adopt new and emerging technologies also adopt new pedagogy. Further, Herrington, Reeves, and Oliver (2005) concluded that commercial course management systems restrict most instructors to the delivery of information rather than to the provision of engaging, authentic learning experiences. So although virtual schools may facilitate better instruction than the traditional classroom, there is no guarantee that this will occur. (Cavanaugh et al., 2009, p.10)

It essential to carry out more research to help school boards, administrators and teachers establish clear guidelines in the analysis and selection of DL materials. The current situation can be likened to the Wild West, where there is tremendous excitement, innovation and novelty, but potentially few established and well-researched guidelines to restrict and improve the selection and delivery of the best possible DL materials. Cavanaugh et al. point out that “The lines between public and private virtual schools has blurred as public online schools choose to become franchises for private course vendors.”(2009, p. 8) Should this be regulated? Who should determine the selection criteria for private course vendors? What kind of selection criteria should be applied? What are the potential long-term effects of this trend? It is clearly time to call for more research into the effects of the marketplace on online education in the public sector.

**2.3 The problem of comparing K-12 online learning with adult online learning**

A further problem with the existing research about the effectiveness of online learning is that the lion’s share of it addresses the success of online and distance learning for adult learners. Cavanaugh et al. warn that “The temptation may be to attempt to apply or adapt findings from studies of K-12 classroom learning or on adult distance learning, but K-12 distance education is fundamentally unique.” (2009, p.4) What, indeed, are the markers of successful online learners? Are these markers learned or inherent? Cavanaugh et al.’s review of the current research identifies certain characteristics that successful online learners need to possess. These include autonomy, greater student responsibility, the ability to self-regulate and metacognition. Cavanaugh et al. explain that,

By the time they reach higher education, most adults have acquired a degree of autonomy in learning, but younger students need to be scaffolded as part of the distance education experience. Virtual school teachers must be adept at helping children acquire the skills of autonomous learning, including self-regulation. Adult learners more closely approach expertise in the subjects they study, due to their long experience with the concepts, whereas children are novices. This distinction is important because experts organize and interpret information very differently from novices, and these differences affect learners’ abilities to remember and solve problems (Bransford, Brown & Cocking 1999), and their ability to learn independently. Expert learners have better developed metacognition, a characteristic that children develop gradually. (Cavanaugh et al., 2009, p.4)

Cavanaugh et al. point out many studies that demonstrate that the most successful online students are those who possess greater maturity and independence, who who were highly motivated by intrinsic sources, and who had strong time management, literacy, and technology skills (Cavanaugh, 2007). These characteristics are consistent with traits that are typically associated with adult learners. (Cavanaugh et al. 2009) Educational psychologists such as Piaget and Vygotsky have proven that children do not learn the same ways that adults do, and that metacognition and locus of control are factors that develop as the brain develops in the later teenaged years.

Barbour’s research in his paper, “It’s Not That Tough: Students Speak about Their Online Learning experiences” confirms existing research about autonomy and independence: “The students examined by Tunison and Noonan (2001) did express concern that the level of autonomy could be too much at times and it was often difficult to work when no one was there to monitor them, indicating they felt their online courses were more work than their in-school courses.” (Barbour, 2012). Interestingly, in Barbour’s most current research, the students in his study did not express explicit concerns about the level of autonomy or independence required to complete their virtual school courses, but they did select “time management of the student” and “motivation of the student” as two of the three most important factors for success in a virtual school course. (Barbour, 2012)

Virtual school researchers Cavanaugh, Gillan, Kromrey, Hess and Blomeyer (2004) state that “since adults have progressed through these stages of cognitive development, delivery of web based education at the adult level need not concentrate on methods that help the learner develop these cognitive skills” (p. 7). Barbour explains that K-12 students “should not be compelled to assume a degree of autonomy they are not ready to handle, and so it is customary in child education for the preparatory and evaluation processes to rest entirely in the hands of the teacher, or in the case of asynchronous web-based instruction the teacher and course developer. Children are not ready to assume high degrees of autonomy, and thus adolescent learners require more structure in their educational settings.” (Barbour, 2012)

* 1. **The results of studies regarding the effectiveness of K-12 online education**

Despite the lack of conclusive research in this emerging field, the general reports about the effectiveness of K-12 online education are generally very positive. Online education, after all, offers many benefits for students who are motivated by and enthusiastic about technology. Education can reach students in remote areas which experience difficulty recruiting qualified teachers, for example (Barbour’s recent 2012 study concentrated on students in Newfoundland outport communities, for example).

In the “U.S. Department of Education Evaluation of Evidence- Based Practices in Online Learning: a Meta-Analysis and Review of Online Learning Studies” many significant findings are reported. Among these, the meta-analysis found that: “on average, students in online learning conditions performed better than those receiving face-to-face instruction” (U.S. Department of Education, 2009, p. ix). Furthermore, the review found that “blended instruction has been more effective, providing a rationale for the effort required to design and implement blended approaches (U.S. Department of Education, 2009, p. xvii). It is important to mention again that out of 51 studies, 44 were conducted on adult learners. Nevertheless, the U.S. Department of Education reported the following:

* Students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction.
* Instruction combining online and face-to-face elements had a larger advantage relative to purely face-to-face instruction than did purely online instruction.
* Studies in which learners in the online condition spent more time on task than students in the face-to-face condition found a greater benefit for online learning.
* Most of the variations in the way in which different studies implemented online learning did not affect student learning outcomes significantly.
* The effectiveness of online learning approaches appears quite broad across different content and learner types.
* Effect sizes were larger for studies in which the online and face-to-face conditions varied in terms of curriculum materials and aspects of instructional approach in addition to the medium of instruction.
* The narrative review of experimental and quasi-experimental studies contrasting different online learning practices found that the majority of available studies suggest the following:
* Blended and purely online learning conditions implemented within a single study generally result in similar student learning outcomes
* Elements such as video or online quizzes do not appear to influence the amount that

students learn in online classes.

* Online learning can be enhanced by giving learners control of their interactions with media and prompting learner reflection.
* Providing guidance for learning for groups of students appears less successful than does using such mechanisms with individual learners (p. xiv – xv).

(U.S. Department of Education, 2009)

In general, other meta-analyses of studies of online learning agree with these findings. Cavanaugh (2004) states that “The consistency of the effects shown in the studies analyzed in this review suggest that as distance education is currently practiced, educators and other stakeholders can reasonably expect learning in a well-designed distance education environment to be equivalent to learning in a well-designed classroom environment.” (Cavanaugh, 2004, p. 16) Moreover, Barker and Wendel (2001) found that “Students in virtual schools showed greater improvement that their conventional school counterparts in critical thinking, researching, using computers, learning independently, problem-solving, creative thinking, decision-making, and time management.” The National Association of State Boards of Education reports that “Evidence to date convincingly demonstrates that, when used appropriately, electronically delivered education—‘e-learning can improve how students learn, can improve what students learn, and can deliver high-quality learning opportunities to all children” (NASBE 2001, p. 4).

1. **Moving Forward: Best practices in online teaching**

Despite the lack of a satisfying and broad enough body of research-based evidence that proves that K-12 online learning is as effective (or even more effective) than traditional, face-to-face classroom instruction, it appears that all indicators are positive for continuing development in this area. Patrick and Powell conclude that “Online learning has the potential to transform teaching and learning by redesigning traditional classroom instructional approaches, personalizing instruction and enhancing the quality of learning experiences. The preliminary research shows promise for online learning as an effective alternative for improving student performance across diverse groups of students.” (2009, p.10)

Many reasons for caution have also arisen in recent research, showing us that K-12 learners cannot and should not be compared with adult learners (where the bulk of study into the effectiveness of online learning has taken place). Younger online learners are challenged by their developing social, emotional and intellectual capacities. They need scaffolding, support, monitoring and guidance as they navigate new online learning worlds. Students who are independent, self-motivated, mature, intrinsically motivated and autonomous fare best in online learning environments. Furthermore, online students need to possess strong technology, literacy and time management skills. There is even less research about how weak, at-risk K-12 students perform in online learning environments. Given the strong enthusiasm for technology and its relative novelty in many public schools (despite developments in technology, most public school students have limited access), it is likely that at-risk students might also show educational gains with more access to online learning.

I have encountered a significant problem in analyzing the studies I have read which compare the effectiveness of online learning with traditional face-to-face classrooms. The underlying question I need answered is about the existing quality of face-to-face classroom instruction. In order to measure the success of online learning vs. classroom instruction, the baseline assumption needs to be made that classroom instruction itself is homogenous, consistent, meeting the basic standards of acceptability and applying the best of current educational research into methods and practice. Only then can the assertion that online learning is “as good as” or even “preferable to” traditional face to face classroom be a valid one. For many children participating in a study, it could very well be that since their traditional classroom was unengaging, disorganized, overcrowded or otherwise problematic, the experience of working in a new, structured, innovative and individualized online programme was indeed a beneficial one. But is this good research? What effect does such research have on teachers who in fact do provide innovative, well-grounded, balanced and engaging instruction for their students in traditional classrooms who are then told that DL is a “better” option for their students because “research points to this”?

In partnership with the research into the effectiveness of online learning, good research has been presented about best practices in online teaching. Regardless of the validity of studies or how the baseline of “good teaching and learning” is established, these best practice guidelines offer hope for teachers and administrators who wish to navigate the new waters of online learning. Above all, the quality of teachers remains the primary determining factor of student achievement, regardless of whether the student learns online or face-to-face. Cavanaugh (2004) states, “One factor warranting special consideration in assessing the effectiveness of virtual schooling is teacher quality. In classrooms, teacher effectiveness is a strong determiner of differences in student learning, far outweighing differences in class size and heterogeneity (Darling-Hammond, 2000). Based on the similarities in student outcomes between distance and classroom learning, there is every reason to expect that teacher preparation is critical in distance education. However, there has been very little formal preparation available addressing the unique nature of online instruction and very little time for teachers to develop their expertise as online instructors.” (2004, p.5)

Other clear best practices that improve student success in both online and offline environments are active learning strategies and immediate and detailed feedback. Cavanaugh states

The most frequently referenced teaching standards in the literature related to the core behaviors of online student-teacher interaction: use of active learning strategies and feedback to students. These standards were followed in frequency by the three that are related to policy and compliance: goals and standards, addressing the needs of all learners, and teaching credentials. The next group of three standards addressed materials and technology, followed by two standards that addressed professional behavior: collaboration with colleagues and use of data to drive instruction. Providing frequent meaningful feedback to students and preparing active learning experiences were accepted as critical elements in both distance and face-to-face teaching (Jonassen, et al., 2008; Moore, 2007), so it was no surprise that they figure prominently in the literature about virtual schools. (Cavanaugh, 2004, p.10)

Kanuka (2002) has developed a set of principles intended to be applied by online educators at the post-secondary level. Her principles included integrating the importance of the content to the learner in its presentation, the use of diverse instructional approaches and meaningful evaluation, along with the use of tools for learner independence. (Kanuka in Barbour 2009, p. 204-206). In a similar vein, Collis (1999) offers this list of ten guidelines for designers of web-based instruction (Collis in Barbour 2009):

1. Plan for flexibility and adaptation when the WWW-based course support system is defined.

2. Design for a variety of roles for both instructors and students; allow roles to be interchangeable or modifiable. Within the same system, offer support for a variety of types of learning experiences.

3. Do not assume students will use the course-support site as a primary source of course content; many students cannot be on-line often or for long periods of time and many do not respond positively to reading from the screen, even when access is not a problem. Books and print materials are better for primary study materials in terms of portability, ease of use and cultural fit than computer materials.

4. Use the course-support site to supplement study materials, and to integrate and manage student study activities. The course-support site should initially be as empty as possible, to be filled by the instructor and students in their own ways as the course proceeds, including accessing student-created or instructor-created materials from previous sessions of the course via the underlying database.

5. Design the WWW site so that students and instructors can input and make use of a variety of combinations of supplementary media and resources: multimedia materials, links to external WWW-base materials, student-created materials, instructor-created materials including computer-based presentation files and notes.

6. Design for minimal technical levels: levels of technical support, for minimal levels of computer-related skills and competencies, for minimal levels of on-line time.

7. Reduce text fixed on the screen to a minimum; use a minimum of graphic and iconic elements and provide context-sensitive help (i.e., via pop ups).

8. Offer a flexible assortment of tools that can be combined for different communication configurations.

9. Design for organisational flexibility: so that courses of different lengths, offered at a variety of times, and with different types and levels of prerequisites and examination/assessment requirements can be supported.

10. Be realistic about what instructors could and should do; instructors have little or no time and little or no interest in creating electronic learning materials and often do course-related activities (preparing lectures, giving feedback to student work, setting test questions, etc.) at the last minute. Design the system to reflect these realities.

(Collis in Barbour, 2009, p. 204-206)

For all the conjecture about the future success of online learning, what seems evident from the recommendations by Collis and Kanuta offered here is that a recipe for student success is thoughtful, individualized, well-organized and clear instructional design. Both online and offline, students need to know that they are seen by their teacher, and that their own personal learning goals and articulated clearly and detailed and prompt feedback is offered regularly.

1. **Final reflections about my own DL experience with “Englishtown”**

I have undergone a significant personal journey in writing this paper. I am reassured by the research that seems to point to evidence that student achievement is strengthened with online learning. In my own teaching practice, I observe all the student behaviours that both contribute to their success with IT, and those which hinder their progress. My students are engaged and enthusiastic, but easily distracted and have difficulty managing their time online. As highly motivated and academically talented high school students, they are as close to adult learners as any population of K-12 learners can be. They report themselves that they prefer f2f classroom interactions to online learning, and seek out the structure and support a traditional classroom offers them.

However, if “Englishtown” reappears next year as a requirement from management (as they have indicated it likely will), I am perhaps willing to accept that its promise of a “money-back guarantee” of learning success is enough for my students, based on the research I have carried out here. The decision to reject Englishtown has come at considerable personal and professional cost for me this year, and if it continues to reappear at management’s insistence, I have to accept its inevitability. If I truly had a choice, I would prefer to design and implement my own DL programme specifically aimed at my own students and their needs.

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