Online Learning in the K-12 Environment

A Synthesis of Research in Online Learning

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Introduction

Students use the Internet to play games, listen to music, and communicate with friends. (Blackboard, Inc. and Speak Up 2006, 2007). They are increasingly using the Internet for researching answers, collaborating with classmates, and for some, doing most or all of their classes online. This learning that takes place partially or entirely over the Internet is commonly called online learning. (U.S. Department of Education, 2010). There are several other terms used to describe online learning such as e-learning, virtual schooling, cyber-school, and Internet-based learning.

This is a rapidly growing side of the K-12 educational sector. The important question is whether online learning is an effective educational approach that leads to positive student outcomes at the K-12 level. Recently, the U.S. Department of Education commissioned a study to evaluate evidence-based practices in online learning. (2010). While research has been steadily increasing in the past 10 years, with more conducted in the last two to three years, there is still much to be learned about the effectiveness of online learning.

There are a variety of ways to teach in an online environment, and certain elements needed to create and evaluate a successful and effective online program. There are still many challenges and issues that face all of the stakeholders, from administrators, to teachers, to students and parents. People are seeking solutions from administration, while others see it coming from increased training and exploring new technologies. However, all seem to agree that online education has become a part of the education landscape and will continue to evolve.

Online Learning in a K-12 Environment

The evolution of non-traditional learning has been around for over 100 years. Barbour (2009) describes the history of K-12 distance education as beginning with correspondence
education as early as 1906. By 2007, there were approximately 700,000 students enrolled in online courses in over 44 states. (Barbour, 2009). In 2009, research showed that number had jumped to over 2 million, with estimates that it will reach 10.5 million for PreK-12 students by 2014 (Nagel, 2009). These numbers include students in all forms of online learning.

Online learning today can be described in three different models. Barbour (2009) uses the terms cyber-schooling and virtual-schooling to describe two of these online learning models. The U.S. Department of Education (2010) also adds hybrid programs to this list. In cyber schooling, a parent provides supervision much like the homeschooling model, and the student interacts with the computer and school-provided materials. The parent and student work with a certified teacher who provides oversight. Virtual schooling is a model with a combination of asynchronous and synchronous delivery. In this model, students interact with online curriculum, turn in assignments and wait for a teacher to give feedback. For a synchronous session, a student might attend a teacher-led interactive class using an online tool. (Barbour, 2009). The hybrid program often includes some form of online learning combined with traditional learning in a brick and mortar environment. Students either attend core classes online with electives at the local school and vice-versa, or do credit-recovery classes online to help with graduation efforts. (U.S. Department of Education, 2010).

While these programs are gaining ground, K-12 school districts are cautious about developing online learning programs and investing district resources. Typically, K-12 administrators depend on outside learning providers, including higher education, independent vendors and state virtual schools. (Picciano and Seaman, 2009). How they develop their programs, and who provides those services depends on the students wanting to enroll in the programs.
Students in the Online Environment

To examine the types of students enrolled in K-12 online courses, the Sloan Consortium conducted a 2005-06 study of school district administrators, with a follow-up study in 2008. The survey results made clear who the online learners might be:

…contrary to popular assumptions that K-12 online learning was supporting mostly students desiring to enroll in advanced coursework, respondents reported that online learning was meeting the specific needs of a wide range of students, from those who needed extra help to those who had to make up courses (e.g., credit recovery) as well as those who wanted to take college-level courses. (Picciano and Seaman, 2009, p. 3).

Who are the most successful learners in an online learning environment? According to Picciano and Seaman’s (2009) survey data and comments, they are self-disciplined, strong self-starters, and have average or above-average academic skills. However, Barbour (2009) notes this may not be accurate as many of the students are the ones who need extra help. This has a clear impact on many of the issues facing those schools today, including developing effective programs to meet those students’ needs.

This can lead to the challenges of determining what makes an effective online learning program. Questions arise around teacher training, funding and resources, technologies needed, and how the program will lead to positive student outcomes.

Is Online Learning Effective?

With the rapid growth of K-12 Online programs, administrators and policymakers are interested in knowing if online learning leads to positive student outcomes. In Patrick and Powell’s (2009) executive summary they note “there is not a single, large-scale, national study comparing students taking online courses with traditional students, using control groups in the
instructional design.” (p. 3). However, the 2010 meta-synthesis report from the U.S. Department of Education, and a review of literature, including the Florida TaxWatch report of 2007, do provide information that begins to answer the question of online learning effectiveness.

The U.S. Department of Education (2010) reported that purely online instruction produced outcomes that were as effective but no better than traditional classroom instruction. This was shown to be the same for K-12 learners as for graduate learners, with undergraduate learners gaining more benefit. (U.S. Department of Education, 2010).

In a review of the Florida TaxWatch Report published in 2007 which examined the effectiveness of one of the largest U.S. online schools, Florida Virtual School (FLVS), Patrick and Powell (2009) noted four main findings from the study. These were that FLVS was “a better use of taxpayer dollars compared to traditional education; “…students perform better than students in traditional classes, based on student achievement;” they serve…” a higher proportion of minority and underserved students demographically statewide;” and they provide “… a new, more rigorous model of accountability for K-12 public education that is data-rich and performance-driven.” (p. 6).

Also reviewed was the National Survey of Student Engagement (NSSE 2008) which found that “online learners reported deeper approaches to learning than classroom-based learners and experienced better use of higher order thinking skills, integrative thinking and reflective learning.” (Patrick and Powell, 2009, p. 9).

Although more research is certainly needed, this shows that online learning is at least as effective as traditional classroom learning. Administrators and policymakers can continue to explore what makes an effective online program, knowing that student outcomes are positive, with an opportunity for continued growth.
Qualities of an Effective Online Program

If Administrators know that online programs can lead to positive student outcomes, then they also need to know the qualities that make for an effective program.

In their review of research on the effectiveness of online teaching and learning, Patrick and Powell (2009) identify several key features: course and instructional design, teacher interaction with parents, students and colleagues, a range of student support services, and teacher training. Of these qualities, teacher training is one important area needing more research and development.

Online Teacher Effectiveness

Effective online teachers must not only know their content, but also have an understanding of how technology and the online environment affect that content, and their pedagogy of what they attempt to teach. Research found that in a survey of K-12 online teachers, the teachers gave highest ratings to their pedagogy and content, but were less confident when it came to using the technology. (Archambault and Crippen, 2009). This is also reflected in Barbour’s (2009) research where he found that “virtual school teachers tended to be much better synchronous teachers than asynchronous teachers.” (p. 14). His reasoning for this was the parallels that could be drawn between synchronous online teaching and the traditional classroom. A teacher could use many of the same teaching strategies that they use in a face-to-face environment. When it comes to asynchronous instruction, the quality of teaching can vary significantly, according to Barbour (2009). He reasons this is because the delivery focuses on the content, not the actual teaching of it.

Online teachers need to receive additional training to help with instructional strategies in the virtual world. However, there are very few training programs for online teachers. The most
common are either internally run courses by the educational institution, or informal mentoring by more experienced teachers in the organization, or a combination of both. (Allen, 2010).

So, how should online teacher education differ from traditional brick and mortar teacher education programs? There is no clear consensus; however, Niess (2005) (as cited in Archambault and Crippen, 2009) identified four vital components for pre-service online teacher education programs:

- an overarching understanding of teaching a particular subject using technology to facilitate student learning
- knowledge of instructional strategies and representations for teaching a particular topic through the use of technology
- knowledge of students’ misconceptions, understandings, thinking, and learning in a particular subject matter and how these might be represented using technology, and
- knowledge of curriculum materials that implement technology to enhance learning in a given content area. (Archambault and Crippen, 2009, “Technological Pedagogical Content Knowledge,” para. 5).

Similar training is needed for in-service teachers. These teachers are often highly experienced, but need the additional training in the virtual world. The standards for this, again, often are left up to the individual schools.

It’s important for organizations and teacher training programs to determine how to deliver the training, what the training looks like, and what’s covered. This is one of the many challenges presented in online learning.
Challenges in Online Learning

According to the research on K-12 Online Learning, several significant challenges have been identified. They are most efficiently summed up in the 2007 Evergreen Consulting Associates annual “Keeping Pace with Online Learning…” report where they note the processes and outcomes of online programs that should be reviewed include:

- Student achievement outcomes
- Student demographics
- Curriculum development procedures
- Teacher training, supervision, and evaluation
- Tracking of attendance and activity in the course
- Special education services. (Watson & Ryan, 2007, p. 7-8)

Picciano and Seaman’s (2009) survey mirrored this noting concerns exist about course quality, development and purchasing costs, funding based on student attendance, and the need for teacher training. However, the data and comments from their survey in both 2006 and 2008 indicate that districts are moving forward with online learning programs. (Picciano and Seaman, 2009).

All of these challenges need to be examined on a wider policy level to determine teacher training, student outcomes, and funding. The research shows that online learning programs are becoming a significant part of the educational landscape. This means that policy-makers need to continue to examine the research to determine how to best meet the needs of these growing programs.

According to Patrick and Powell (2009), larger scale studies are needed. They indicate that researchers should collect existing data sets from standardized state tests and compare those
with virtual school student performance data. However, they also go on to note that examining comparisons across states is difficult given the difference in academic standards and assessments in each state. (Patrick and Powell, 2009).

**Conclusion**

Online learning is a rapidly growing field that is reaching a critical point in its expansion. Administrators and policymakers are faced with increased decision-making about how to deliver engaging, interactive instruction with highly qualified and trained online teachers, while keeping an eye on the bottom line for funding.

The data around online learning is still developing, although initial reports show it to be at least as effective as traditional classroom learning. This bodes well for supporting the rapid growth and increasing interest on the part of students, teachers, administrators and policy-makers. However, more research is needed that helps to identify how to develop effective, comprehensive programs.

In addition, organizations need to develop programs to prepare online teachers for their unique occupation. These programs need to center around both instructional design and delivery targeted for online learners in the K-12 environment. This might happen at the pre-service, or the in-service level, but must be factored in to the equation.

Many K-12 learners and their families are engaged in online learning, and that number is expected to grow. With further research identifying what makes an online program most effective, this field should be considered a viable educational option for a variety of learners.
References


