Blended Learning Transforming the Factory Style of Education

Elizabeth Ulivella 10 February 2014

Summary

Blended learning is poised to transform the factory-style education model as it exists in American schools today. The blended learning theory of change is predicated on the belief that adding an online personalized learning element to traditional classroom education will provide improvements in student performance and achievement. In the era of No Child Left Behind, the average graduation rate nationwide is 78.2 percent, with greater disparities existing from stateto state. This article examines the potential of blended learning as a social innovation through the use of case studies and researchbased exploration of key issues. Highlights include:

- An in-depth look at the difficulties that persist in US education
- Blended learning definition and models in theirvarious forms
- Two PA case studies showingblended learning in practice, including results
- An examination of public/private partnerships and

their financial benefits
- Key considerations for replication
- Social return oninvestment formula and calculations
- Policy implications for scaling blended learning nationwide
- Future predictions for blended learning in the short and long terms

Blended learning isan alternative method of education for students that providesopportunitiesfor personalization through online learning platforms combined with traditional classroom education. Blended learning increases students'education options in areas where they previously did not exist, such as access to specialized courses and control over time, place, path and/or pace.

Several models of blended learning exist, varying in the degree towhich online learning is combined with brick-and-mortar education. According to the Clayton Christiansen Institute, those models that are more evenly balanced are considered sustaining innovations, while online learning models designed to replace brick-and-mortar education are considered disruptive.

Blended learning offers the potential for a social return on investment (SROI) approximated at $12,205,320 in the state of Pennsylvania. The figure was arrived at by applying the unemployment rate of those with less than a high school degree to the population of students in Pennsylvania who are predicted to not graduate high

school and then calculating the cost of unemployment insurance for this student population. With a perceived 2 percent increase in the graduation rate attributable to blended learning, the social return on investment amount represents cost savings in unemployment insurance.

Policy implications for scaling blended learning nationwide include assessment of the quality and effectiveness of blended learning as a whole, method of assessment, student choice, funding models and considerations for teachers unions and teacher education programs. Predictions for blended learning include the continued organization of school districts and brick-and-mortar schools but with hybrid blended learning models as the predominant learning platform. Disruptive forms of blended learning have greater opportunity to take place at the middle school and secondary school level in the form of student choice.

Dellicker Strategies, a PA-based broadband infrastructure and blended learning consultant firm, and“High-PerformingHigh School” (HPHS) inwestern Pennsylvania are both implementing blended learning programs but in different ways. Dellicker Strategies seeks to bring about enhanced student performance through the station rotation model of blended learning. HPHSis using an a la carte model, providing online specialized courses within its schools, in surrounding area schools and nationwide.

Both Dellicker Strategies and HPHShave engaged in

public/private partnerships that have resultedin financial benefits including cost savings and the generation of new revenue streams.

Key replication considerations for schools thatwish to add a blended learning component or districts that wish to start a new blended learning school coverfour areas: content, teaching, technology and operations. The strategic planning process should focus on the education goals of the program or school.

The Issue

American public education is at a crossroads. There is a divide in access to equal public education in the United States today, with students attending public schools ranging from high-performing to failing and with charter schools whose access is limited by lottery systems. Many schools are struggling to meet the demands of preparing students to face the challenges of a global economy. In response, charter schools, cyber schools and teacher preparation organizations like Teach for America have entered the picture, challenging the traditional school model and providing students and their families with new options. Some hail these innovations in education as successful, while others criticize them as experimental and risky.

Advances in curriculum software are also playing an increasing role in the way students learn, providing them

with the ability to learn at their own academic levels and paces while providing educators with real-time student performance data, allowing for enhanced monitoring and planning. The blended learning theory of change is based on the idea that combining customized learning using online technology and curriculum software with brick-and-mortar education will produce better results than brick-and-mortar education alone.

Blended learning is an umbrella term used to describe several different models that vary in the degrees to which online learning is balanced with traditional brick-and-mortar learning.Does blended learning offer the solution in tackling the issues that face US schools today? In order to investigate this question, we must look more closely at some of the issues facing American schools.

The No Child Left Behind Act of 2001 (NCLB) was an attempt at education reform that aimed at preparing students for career and college readiness by holding schools accountable for meeting adequate yearly progress assessments as determined using standardized testing scores. While proponents believe that accountability is the answer to raising literacy and math proficiency among all students, opponents of NCLB criticize the emphasis on standardized testing asa narrow system of measurement that pressures schools to “teach to the test,”thereby shortchanging students on a rich educational experience.

Most recently, Pennsylvania was granted an exception in meeting NCLB assessment requirements through a flexibility waiverand will instead issue School Performance Profiles, “which will provide a comprehensive overview of multiple measures of student achievement; Pennsylvania citizens will be able to determine the quality of the educational programs in their schools and how students are performing” (Pennsylvania Department of Education, 2013).

While this development is still too new to determine whether it will result in more positive outcomes, School Performance Profiles might potentially be built in part through the data-reporting features of curriculum software for those schools using blended learning strategies.

In the meantime, schools continue to struggle to provide every student with the education they need to succeed. The disparities in graduation rates per state and in subject matter proficiency across student populations are indicative of the challenges associated with a one-size-fits-all approach to education.

According to The Condition of Education 2013,a report by the US Department of Education National Center for Educational Statistics (USDOE NCES), the graduation rate in US public schools in 2009–2010, the most recent year for which data are available, was 78.2 percent, with a percentage range of over 30 points between some states.

Vermont had the highest graduation rate, at 91.4 percent, and Nevada had the lowest rate, at 57.8 percent. These figures become even more troubling when combined with the achievement gap as viewed by race/ethnicity. The graduationrates for Hispanic, American Indian/Alaska Native and Black students were below the national average at 71 percent, 69 percent and 66 percent, respectively (USDOE NCES,2013).

Levels of proficiency in subject matter also demonstrate a need for continued improvement. According to long-term trends as provided through the National Assessment of Educational Progress, while reading and math scores improved among 9- year-olds and 13-year-olds from the 1970s to 2008, scores for 17-year-olds in reading and math were not measurably different. Additionally, proficiency scores among American students in math, science and reading as conveyed through international assessments such as the TIMSS (Trends in International Mathematics and Science Study) and the PIRLS (Progress in International Reading Literacy Study) place the United States among the top participating education systems in 2011, though the country does lag behind several nations in all three subject areas, including portions of China and the Russian Federation (USDOE NCES, 2013).

The Solution

Schools across the nation are turning to online learning as a solution to some of these issues. According to the

Evergreen Education Group, it is estimated that slightly more than 5 percent,some several million, of the total K–12 population is participating in some form of online learning whether fully online or a combination of online and traditional classroom learning, defined as blended learning (Evergreen Education Group, 2012).

The Clayton Christensen Institute for Disruptive Innovation defines blended learning in three parts:1)blended learningis a formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path and/or pace; 2)blended learning takes place at least in part in a supervised brick-and-mortar location away from home; 3)blended learning refers to the modalities along each student's learning path within a course or subject that are connected to provide an integrated learning experience (Clayton Christensen Institute, 2012).

Blended learning is categorized intofour different models, each varying in degree as to the balance of brick-and-mortar and online learning. They are: rotation, flex, a la carte and enriched virtual. The rotation model contains four sub-models: station rotation, lab rotation, flipped classroom and individual rotation.

- The rotation model is "a program in which within a given course or subject (e.g., math), students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is

online learning."

- The flex model is "a program in which content and instruction are delivered primarily by the Internet, students move on an individually customized, fluid schedule among learning modalities and the teacher-of-record is on-site."
- The a la carte model "describes a scenario in which students choose to take one or more courses entirely online to supplement their traditional courses and the teacher-of-record is the online teacher."
- The enrichedvirtual model is a "whole-school experience in which within each course (e.g.,math), students divide their time between attending a brick-and-mortar campus and learning remotely using online delivery of content and instruction." (Clayton Christensen Institute, 2012)

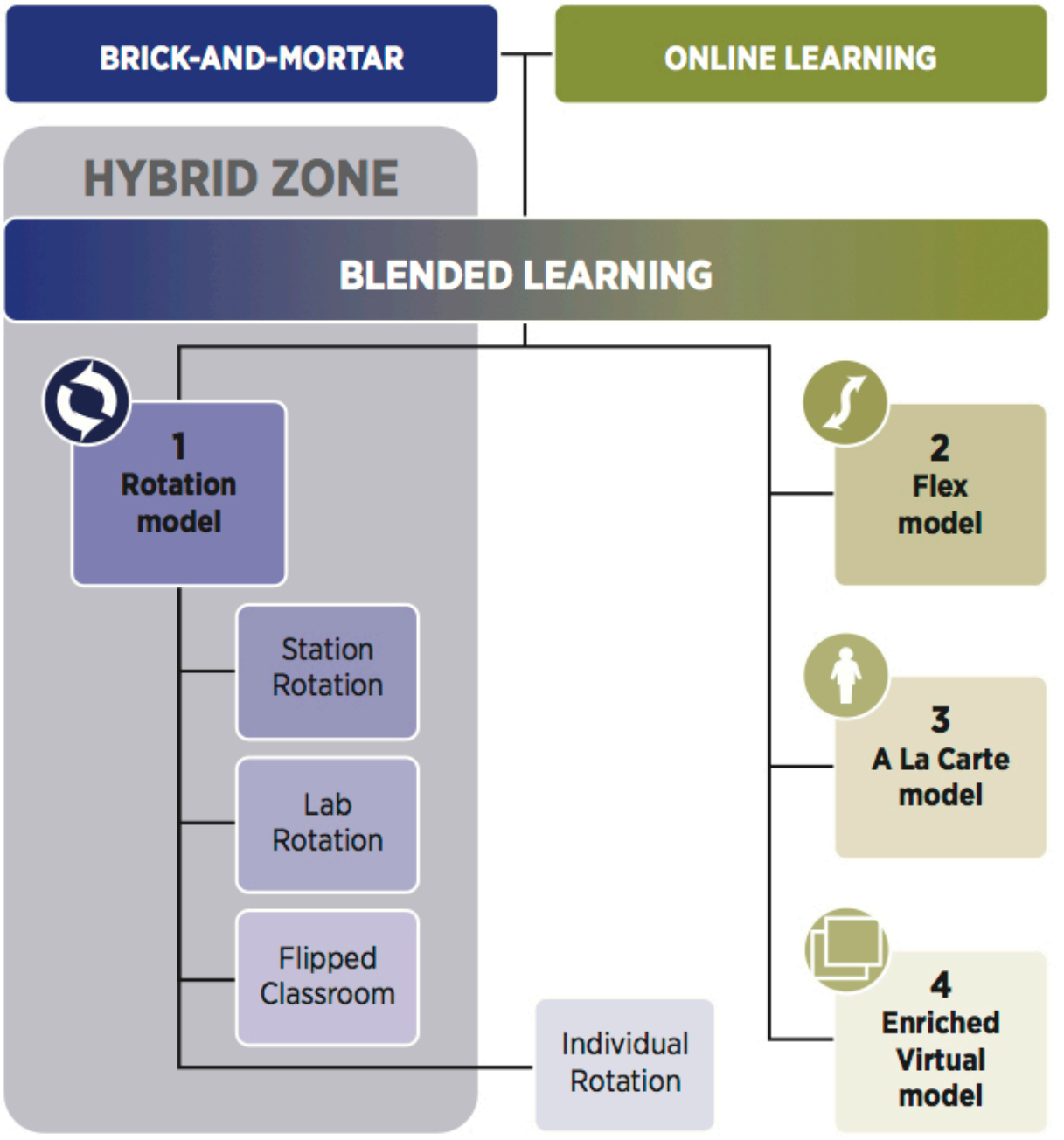

Figure 1. Clayton Christensen InstituteHybrid Models of Blended Learning (2013)

Blended learning can be understood through the concepts of two types of innovations, sustaining and disruptive. The models in the hybrid zone in Figure 1 are considered sustaining models because they are looking to improve upon the existing structure of brick-and-mortar education. The models on the right are considered disruptive because they place more emphasis on the

innovation as a replacement for existing structures.

Theory of Change and How It Will Be Measured via Case Studies

The theory of change behind blended learningas a social innovation focuses on the idea that curriculum software and online learning resources can be used as toolsforproviding differentiated learning for students through the use of online learning models. For example, “smart” software adapts to the student’s activity and will alter the scope and sequence of instruction accordingly.

Blended learning strategies can be used as improvements to or departures from the traditional classroom structure of education today,under which all of the students in a class typically learn from a single teacher about a single topic taught from a single perspective. Adding to this scenario are the diverse academic levels among students themselves, which result in a range of student engagement levels during teacher-led classes. While students in the middle range may connect with the material, students above or below may be disengaged, either because of boredom or because of difficulty matching the pace of the instruction. Students are then assessed on their proficiency using standardized methods of measurement.

Dellicker Strategies provides us with a good example of the station rotation model of hybrid learning in use.

Dellicker Strategies, led by CEO Kevin Dellicker, is a broadband infrastructure consultant company that assists school districts in Pennsylvania that are looking to implement blended learning programs in their schools. Dellicker has been successful in his efforts, bringing 15 new hybrid schools this past year and having 33 slated for the upcoming year.

The station rotation model is in predominant use among Dellicker's clients and consists of a scheduled rotation of students in a class who move from a small-group, teacher-led learning station to a collaborative online student group activity station to an online individualized learning station. This rotation model provides benefits in that the teacher can give extra attention to students in the teacher-led station because the group is smaller. The students in the other two stations are also benefitting from the individualization the learning platform provides.

Schools make the ultimate choice as to the online learning platform they wish to use, but Dellickermakes software recommendations based on schools' particular needs. In some cases, free software like Schoolology is the best solution, but in other cases, the cloud-based Hybrid Learning Management System by Education Elements may be selected for its unique features: a single sign-on that syncs to student records, real-time student performance tracking and a teacher dashboard that allows access to student data and the ability to customize lessons. Dellicker works with the schools he supports by

compiling student performance data across 16 objectives and 25 tasks into final reports each August (K. Dellicker, personal communication, July 1, 2013).

Dellicker's reports from the 2012–2013 school year provide evidence of success. Standardized test score results from the Pennsylvania System of School Assessment tests and the Keystone exams supply the following statistics:

- Among the 15 pilot districts, 88 percent of schools achieved higher academic performance in their hybrid classes compared withnon-hybrid classes in the same district andcompared withstatewide benchmarks.
- Seventy-five percent of pilot districts realized higher academic achievement in hybrid classes.
- In addition, five of the hybrid learning pilot schools received an analysis of academic growth by the Pennsylvania Department of Education—all met or exceeded state standards for academic growth. (Pennsylvania Department of Education, 2013)

Other examples of success exist as well. Education Elements has reported successful results using its Hybrid Learning Management System at the Kipp Empower Academy in Los Angeles.

In the 2010-2011 school year, KIPP Empower, an elementary school in Los Angeles implemented

personalized learning with the assistance of PennsylvaniaHybrid Learning Institute(PA HLI) early partner, Education Elements. After the school implementedpersonalized learning, students improved from 36 percentadvanced or proficient in reading to 96 percent according to standardized tests:By the end of the first school year, 96 percent of students scored above the national average in reading and math (Bernatek and Cohen et al., 2012, p. 25).

Another aspect of the blended learning theory of change includes programs that have the potential to expand access to underserved segments of the student population while increasing motivation through student choice. Areas of non-consumption exist in school systems in which resources may be limited, such as in smaller rural districts or low-income urban districts, where it may be difficult to attract, hire and retain highly qualified teachers in specialized subject areas such as advanced placement or remedial courses.

One school,"High-PerformingHigh School" in western Pennsylvania, is working to alleviate this disparity in resources by using technology to broadcast advanced placement and remedial courses to surrounding area schools that are not able to provide this level of instruction for themselves. Last year, an advanced course in linear algebra was made available to area schools; this year Arabic language and culture will be offered. The opportunity for student course choice at the secondary

level makes this a la carte model of blended learning a logical choice.

For the first time this year, remedial coursework implemented by HPHS will also be offered. According to the school's assistant superintendent, the challenge in providing remedial instruction at the state level lies in the significant percentage of studentswho do not test as proficienton the required standardized tests. It is state-mandated that schools provide remedial instruction to students in the areas in which proficiency is not metas assessed by the Keystone examinations.

In this particular school district, HPHS uses curricula developed by teachers on Canvas,an online learning platform on which students follow a decision tree that allows them to move forward or backward depending whether the student supplies the correct answer. In this way, students are unable to leave areas of weak performance unaddressed; they must get the answer right to move on to the next set of lessons (HPHS assistant superintendent, personal communication, July 17, 2013).

Public/Private Partnerships & Financial Aspects

While Dellicker Strategies and HPHS are using blended learning in very different ways, they have both leveraged the power of public/private partnerships in order to forge ahead in their blended learning initiatives, creating

avenues for cross-collaboration and mutual benefits.

Dellicker created the PA HLI which is a coalition of Dellicker Strategies, which supplies the expertise and products for schools entering the blended learning landscape, and severalIntermediate Units,which are advisory boards for school districts that were formed by the General Assembly in 1971 to help public and private schools across Pennsylvania implement cost-effective, management-efficient programs(K. Dellicker, personal communication, July 1, 2013).

In essence, this relationship not only links Dellicker with schools considering blended learning programs but also provides financial gains. Dellickernegotiates volume discounts to schools, who sign on in groups through consolidated contracts. Schools save money, and DellickerStrategies increases its client list. Dellicker also suggests that blended learning models are a neutral investment in the short term that saves costs in the long term because they replace the need to update costly textbooks and other supplemental curriculum resources.

HPHS,using a different approach, has formed a relationship with a national provider of online curricula in the creation and offering of advanced placement courses to area and nationwide schools. This translates to a possible new revenue stream for the school.

In addition, the partnership will eventually lead to

additional revenue for the district for the use of its courses. HPHS plans to stay closely involved in the intellectual ownership and facilitation of the courses in order to maintain course quality and their own reputation of excellence as a school. The partnership will help to expand access to HPHS's courses beyond just area schools to districts nationwide.

Replication

For those starting a new blended learning school or for schools considering adding a blended learning component, there is much to consider. The question at the heart of the process is,"What are the educational goals of the school/program?"

Desired outcomes may include: increasing proficiency in core content areas, stimulating student motivation through student choice, reaching students with specific learning needs through personalized platforms or attempting to bridge the achievement gap between typically performing students and the at-risk students who may struggle in brick-and-mortar environments.

The four areas for strategic planningidentified by the Evergreen Education Grouparecontent, teaching, technology and operations. Figure 2highlightsseveral considerations within each of the four planning areas (Evergreen Education Group, 2012).

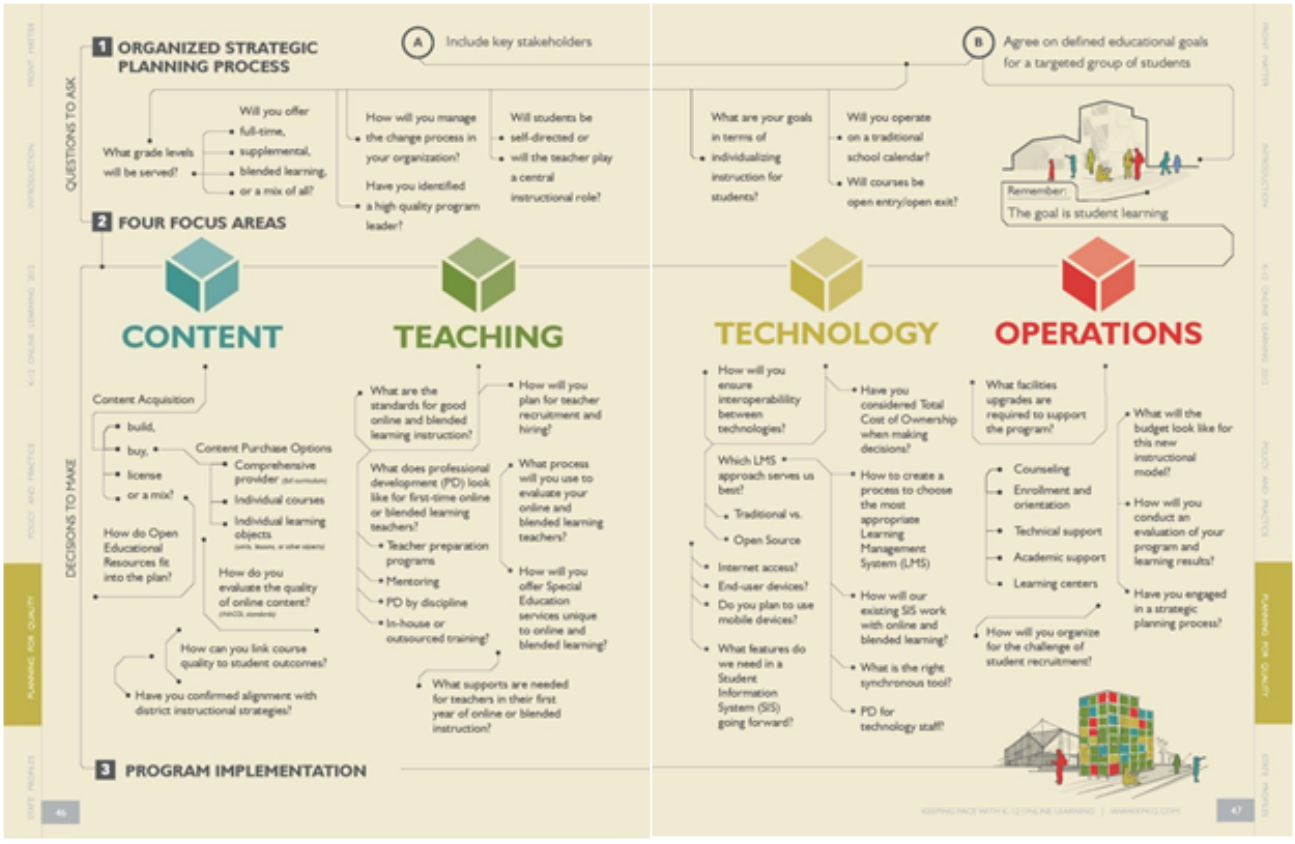

Figure 2. Evergreen Education Group's Strategic Planning Roadmap (2012)

The overall blueprint for success in the implementation of blended learning programs includes consistent leadership in providing organizational vision and political and/or financial support by key stakeholders. As demonstrated inthe case studies, public/private partnerships may play a role here, with private stakeholders helping to fund the initial setup stages and supply the equipment and software.

However, the cost of incorporating blended learning programs need not be exorbitant. In fact, with bulk rates for curriculum software ranging from $10–$80 per student, along with the cost of a laptop and wifi access, the implementation of a blended learning program could

represent a modest proportion of the overall per pupil yearly expenditure, which is currently in the range of $400–$600. Currently, the United States spends $10,000 to $18,000 per year per pupil. This adds up to no more than 6 percent of the annual expenditure, and if the blended learning component is in fact replacing previously used textbooks and other curriculum supplies, the investment could be considered neutral, orcould even yield savings in the long term.

The successful launch of blended learning within a school might begin with a pilot program targeting a small segment of the student population in the beginning and then growing to include larger populations of students based on success rates. The practical aspects of launching a blended learning program include such issues as selecting an online content provider, teacher training, evaluation systems and parental engagement. With regard to technology, schools must have access to broadband networks and an infrastructure equipped to handle the functionality of the program.

Measurement/SROI

Researchers have confirmed the link that students who do not read proficiently by the third grade are four times more likely than those who read proficiently to leave high school without their diplomas (The Annie E. Casey Foundation, 2012). According to the Bureau of Labor Statistics (2013), for those with less than a high school

diploma, unemployment rates hover around 12.4 percent, presenting a difficult road ahead. The potential long-term impact of successful blended learning schools and programs may include increased graduation rates attributable to increased proficiency among participating students.

As demonstrated in the case studies above, KippEmpower students improved from 36 percent advanced or proficient reading scores to 96 percent according to standardized tests, and 75 percent of Dellicker's pilot schoolsrealized higher academic achievement in hybrid learning courses. In both cases, the results have beenpositive. Even so, I have chosen to attribute a conservative estimate of a 2 percentincreasein graduation rates to blended learning programs' success in boosting proficiency, because consistent data are limited.

Therefore, it is a fair assumption that increased graduation ratesattributable to gains in reading proficiency through blended learning programs can lead to a lower percentage of unemployment. The reduced expense incurred through unemployment insurance provides $12,205,320 in savings, which is the social return on investment (figure is based on increasing the graduation rate in PA by 2 percent). The steps below demonstrate how the SROI was calculated (all figures from US Census Bureau, 2014):

1. There are 12 million people in PA, 2,500,000 under the age of 18 (school age).

2. The current high school graduation rate in PA is 83 percent, or 2,075,000 students
3. 2,500,000 -2,075,000= 425,000 students not attaining their high school degree.
4. 12.4% (unemployment rate of those with less than a HS degree) of 425,000=52,700 collecting unemployment insurance
5. $386.00 (Average amount of unemployment insurance per person)*×30 weeks=$11,580.00
6. 52,700 x $11,580.00=$610,266,000 total paid in unemployment insurance
7. Increasing the graduation rate even 2 percent through blended learning programs will result in 2 percent×$610,266,000=$12,205,320 in savings, the social return on investment.

Upon review, the projected amount Pennsylvania may spend on unemployment insurance for those students who do not earn their high school diploma is estimated at $610,266,000. If graduation rates were to increase by just 2 percent a cost savings of up to $12,205,320 could be possible.

Policy Implications and Scale

Of course, as a social innovation, blended learning has policy implications withregard to its nationwide scaling,beginning with assessing its quality and effectiveness. The current emphasis onstandardized testing as implemented through NCLB to determine

student proficiency may not be the best way to measure personalized blended learning programs.

Because of this, there is a push to move to growth assessments, which measure the amount a student has learned over a period of time as opposed to a standard of proficiency. But growth assessments are not without challenges; they are complex, and results are varied to such an extent that drawing consistent conclusions is difficult.In addition, meeting state standards for student achievement will continue to be a goal for schools using blended learning models as it is for their brick-and-mortar counterparts.

Access to blended learning programs nationwide and determining appropriate areas for student choice are also key issues. In Pennsylvania, the E-Fund program is credited withbringing broadband services to all schools in the state. But in other states, broadband access in certain geographic locations may hinder the ability for schools to implement blended learning programs, which translates to the need for state, federal or perhaps private funding to help expand broadband networks.

State laws may restrict students' supplemental(to their brick-and-mortar curricula) course choicesto only a single provider or they may allow choice from among multiple providers. In addition, public funding for online courses follows the student and is disbursed in pieces, half at enrollment and half at successful completion. This system

provides students with the ability to move through their coursework as fast as mastery of the subject matter will allow, which is a departure from prescribed “seat time.”

Funding models as they exist today will likely need to evolve for blended learning to be made available nationwide. While the need for government funding will continue to exist, publiceducation funds will have to be set aside specifically foreducation innovations. The difficulty lies in balancing budgets betweencurrent fiscal responsibilities and investment in innovations as theyrelate to education.

Blended learning can be supplemented through alternative methods of financing, however. This year, Next Generation Learning Challenges awarded $6.6 million to 38 schools for personalized learning programs,funded bythe Bill and Melinda Gates Foundation (Clayton Christensen Institute, 2013b). One recipient was Lebanon School District,a member of the PA HLI. They received a Launch Grant of $150,000 plus an additional $300,000 that is contingent on a 1:1 funding match. Thismedium-sized school district is made up of a diverse student population. The plan is to implement hybrid learning in Lebanon High School in order to personalize learning in a cost-effective manner by working within the current school structure.

As blended learning continues to be adopted by schools, teachers unionsmay have mixed reactions. Blended

learning models allow the student–to-teacher ratio to increase, which in turn may lead to a decreasednumberof teaching positions. While this could be a valid fear, the Clayton Christensen Institute predicts a nationwide teacher shortage in the current decade based on the current trajectory of the percentage of teachers retiring (Christensen, C., Horn, M.,& C. Johnson. (2011). Andwith so many different blended learning models in practice, across-the-board nationwide cuts are not necessarily predictable.

Dellicker's pilot school data present positive teacher reactions to blended learning instruction as highly effective and enjoyable:

- Eighty percent of hybrid teachers said their model of teaching was "always" or "often" effective.
- Seventy-five percent of Lebanon HS teachers said their students received a better education in the hybrid setting.
- Sixty-eight percent of hybrid teachers said they "always" or "often" enjoyed teaching in a hybrid setting. (PA Hybrid Learning Institute, 2013, p. 10)

If the innovation becomes widespread,the teachers who endure will be those who see value in the innovation and will develop the skills and credentials that will keep them viable. This of course means that teacher education programs will also need to evolve as the landscape of American education continues to change.

Conclusion: What's Next for Blended Learning? Predictions for US Education

The Clayton Christensen Institute predictsthat brick-and-mortar schools will still exist with students continuing to be organized in school districts. However, the hybrid or sustaining models of blended learning will become the dominant instructional models in an effort to make improvements to the current factory style of learning.The institute sees the more disruptive blended learning models taking hold at the middle school and secondary levels,where course choice exists.

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