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Undoing the Factory Model: A Practical Field Test in Blended Learning

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A Practical Field Test in
Blended Learning.

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by

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ABSTRACT

The successful implementation of e-learning strategies into the learning process is not a new idea. Education was first introduced to the concept of digital natives using technological tools to learn over a decade ago now, and yet we remain a nation struggling to come to terms with the educational potential of technology. It is true, that the past ten years has seen a significant integration of hardware into the classroom; the question must be asked however, whether this has been wastefully accomplished by many schools, without predetermined planning or the development of strategic outcomes for its use. Merely, introducing these new technologies into the classroom does little to address the needs of student s – while it might create a welcome instructional environment for them, it does not address the compelling "elephant in the room." Being able to orchestrate a student-centered, technology-rich lesson requires much expertise on the part of the teacher and a system-wide universally acknowledged educational technology plan.[1] This study will examine the paradigm shift required of teachers and the practical reality of adopting a blended learning environment to meet the needs of a diverse school district.

[1]Mills, S.C., & Tincher, R. C. (2003) Be the technology: A developmental model for evaluating technology integration. Journal of Research on Technology in Education, 35(3), 382-401.

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Introduction

Statement of the Problem

The Lawrence Public School District, like thousands of other schools districts across the nation, sits on the very edge of the technological revolution that is impacting the learning process for all students. With an abundance of technology of all types and sizes being used in each school, and with no clear definition regarding the way that it should be utilized, there is naturally concern over the lack of thoughtful planning as to how it should all work.

In addition, the district faces a number of ongoing challenges including: an achievement gap that persists between the performance levels of students of color and their white peers, schools that face increasing numbers of students from low socio-economic backgrounds, the need to steadily improve graduation rates for students of color, and the need to meet the full diversity that a university town brings. In addition, over the next twelve months the district is seeking to implement the Kansas Common Core Standards successfully, while increasing student engagement in classrooms at all levels.

The challenge is to develop a systemized blueprint for educational technology throughout the district that addresses the types of technology to be used

at each school level, and the role that technology should play within each classroom. Defining the benefits of educational technology in the learning process is such a critical component of implementing a district-wide usage policy: the balance of flexibility to allow for a differentiated approach, and the structure required to allow for a systemic approach.

Planning, developing, implementing, and evaluating the best blueprint possible remains the ultimate challenge.

Statement of the Hypothesis

It is assumed that a blended learning approach to classroom instruction will allow the district to address the issues surrounding a student-centered implementation of the Common Core Standards, while increasing student engagement in the learning process and allowing for the development of a district-wide educational technology blueprint.

Objectives of the Study

The main objective is to determine how and if a blended learning approach can be used at the primary, elementary, middle, and high school classrooms, and to see whether or not such an approach would be a feasible option for USD 497. There are multiple components to the Field Test developed, though these are tested

predominantly through the piloting of a blended learning environment at various levels across the district.

Within this broader framework there are several other objectives or questions that are areas of focus, most of which specifically pertain to whether or not a blended learning approach has benefits for student engagement, equity and/or academic achievement. The field study will allow for the close monitoring of a blended learning classroom in all types of demographic and with a full variety of subject matter. Data will also be collected on the teacher's abilities and feedback regarding the experiment. What are the inherent skills required to be successful in such a model, and do we feel that such a model is feasible given the present dispositions of the teachers generally?

The district must determine whether or not it has the resources and capability to develop course shells that can be universally used as a template syllabus for teachers throughout the district. Each year the district faces the task of integrating between 50-100 new teachers. The potential benefit of a resource that allows these new faculty members to have courses pre-built with all of the relevant resources, materials, content, textbooks, and assessments could be invaluable.

CHAPTER TWO

Review of Literature

There are few areas of focus more often discussed in recent years, that the integration of technology into the classroom. Research is plentiful on many aspects of technology in education, both regarding the types and ways for it to be used, and in the impact that it has on creating a successful learning process. A great deal of research studies the relevance of technology, and report that in various ways children are more comfortable with, more adept at, and more motivated with the use of technology in their learning. Moreover, today's students have developed skills of communication, problem solving, and collaboration, with and through technology. These social skills are developed through collaboration and networking and they build upon a foundation of skills necessary to equip students with the tolls to be successful throughout their school careers.

Classrooms today, are being challenged by the dynamic nature of the students who populate them, and, in particular, the fact that these "digital natives" are immersed in technology more seamlessly than many of those who are charged with their education. While in 1995 only 8% of U.S. households were dialed into the internet, today cover 77% of U.S. households have Internet access.[2] The Media Literacy Clearinghouse has reported that today 52% of all 0 - 8 year old children

[2]Internet Access - Households and Individuals, 2011. (2011, August 31). *ONS Home*. Retrieved November 19, 2011, from http://www.ons.gov.uk/ons/rel/rdit2/internet-access---households-and-individuals/2011/stb-internet-access-2011.html

have access to mobile devices, and in a typical day, one in ten of those children in the 0 - 8 year old range, will use those mobile devices to play games, watch videos, or use other apps. This generation of technologically-savvy students, are pushing the comfort levels of those who teach them, and many of our classrooms are not meeting the digital needs of their students. Recent studies argue that our world is becoming more and more complex, and teachers must shift from "teaching...isolated skills and information within each content area, to teaching skills that enable students to solve complex problems across many areas".[3] In a recent poll, when asked "what will be the classroom rules for this fall?" three choices were given to school districts. 'Bring whatever you have', 'Laptops only', and 'everything goes off and away'. Interestingly, 'Bring whatever you have' was the preferred choice by over half of the participants at 51.73%. The second choice was "Everything goes off and away" at 32.18% so most schools are either allowing all devices to be used or none at all.[4]

More increasingly, prominent groups and organizations have become openly critical of the speed at which the average public school district is adapting to, and adopting educational technologies in the classroom. Jason Ediger, Director of iTunes

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[3]Martin, R., Sexton, C., Franklin, T., Gerlovich, J., & McElroy, D. (n.d.). Why Use Technology in the Science Classroom? | Education.com. *Education.com | An Education & Child Development Site for Parents | Parenting & Educational Resource*. Retrieved November 3, 2011, fromhttp://www.education.com/reference/article/why-use-technology-science-classroom/

[4]"BYOD: what will be the classroom rules for technology this fall?" *Technology & Learning* Sept. 2011: 8. *Academic OneFile*. Web. 18 Mar. 2012.

U and Mobile Learning of Apple, notes, “Educators have turned school classrooms into something like airplanes. Students accustomed to using technologies all the time enter classrooms and are forced to turn off their digital devices and sit tight”.[5]The fear is that laptops and mobile devices will cause distractions and disruptions, hindering education rather than helping it. The question remains however, just how much of this is a smokescreen designed to avoid the real issue – teachers are just not comfortable with the technologies they are being asked to utilize in the learning process. When students are allowed to take an active role in their learning, “distraction [from technology] becomes much less an issue”. Indeed, research has found that “the truth is that distraction occurs when students lack meaningful, relevant interaction with content, and cheating is greatly diminished when assessments require students to apply what they have learned to solve complex, real-world problems.”[6]Instead of technology being a distraction, educators can see it as an “opportunity...to change the design of their entire instructional approach”… “Creative and innovative teachers can use technology innovations to

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[5]Fang, B. (2009). From Distraction to Engagement: Wireless Devices in the Classroom (EDUCAUSE Quarterly) | EDUCAUSE. *What is EDUCAUSE? | EDUCAUSE*. Retrieved November 3, 2011, from http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/FromDistractiontoEngagementWir/192959

[6]Galindo, Jeannie. "BYOD is not to blame." *Learning & Leading with Technology* Feb. 2012: 8. *Academic OneFile*. Web. 18 Mar. 2012.

help reform teaching, similar to the way Guttenberg's press helped bring about scientific revolution and modern authorship". [7]

The paradigm shift required to successfully implement e-learning strategies is not a new concept. Marc Prensky first introduced us to the concept of digital natives being taught by digital immigrants over a decade ago now, and yet we remain a nation struggling to come to terms with the educational potential of technology.[8] It is true, that the past ten years has seen a significant integration of hardware into the classroom; the question must be asked however, whether this has been wastefully accomplished by many schools, without predetermined planning or the development of strategic outcomes (somewhat ironic, given that these terms serve as the foundation for modern "educational speak") for its use. Merely, introducing these new technologies into the classroom does little to address the needs of these digital natives in terms of the process of learning. While it might create a welcome instructional environment for them, it does not address the compelling "elephant in the room." Being able to orchestrate a student-centered, technology-rich lesson requires much expertise on the part of the teacher.[9]

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[7]Fang, B. (2009). From Distraction to Engagement: Wireless Devices in the Classroom (EDUCAUSE Quarterly) | EDUCAUSE. *What is EDUCAUSE? | EDUCAUSE*. Retrieved November 3, 2011, from http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/FromDistractiontoEngagementWir/192959

[8]Prensky, M. (2001). Digital Natives, Digital Immigrants, On the Horizon MCB University Press, Vol. 9 No 5, October 2001

[9]Mills, S.C., &Tincher, R. C. (2003) Be the technology: A developmental model for evaluating technology integration. Journal of Research on Technology in Education, 35(3), 382-401.

Most recent research conducted in this realm finds that genuine integration of technology into the learning process has several positive implications. Clearly the most compelling is that students demonstrate higher levels of motivation and engagement, which, in turn leads to more independent learning and a better real connection with the material being studied. These students "work collaboratively, actively explore and discover concepts and phenomena, take ownership of their learning and work on problems that are based in authentic and real-life contexts."[10] These skills, founded in the concept of constructivist theory, speak directly to the platform adopted by the Common Core Standards, and therefore serve as the basis for curriculum that has a broad universal appeal across the country. The use of educational technology also maximizes the benefits of Gardner's theory of multiple intelligences, and allows teachers to individualize instruction and to use a differentiated approach to instruction. According to the U.S. Department of Education, both teachers and students were "surprised at the level of technology-based accomplishment displayed by students who have shown much less initiative with more conventional academic tasks."[11]It is not just an increase in motivation that is witnessed, but also an increased participation in academic work. Students who are able to use technology in their learning typically engage in the activity with

[10]Mims, C., Polly, D., & Grant, M. (2009, June 30). Technology Integration in K-12 - The Foundations of Instructional Technology. *Projects Server Introduction*. Retrieved November 3, 2011, from http://projects.coe.uga.edu/ITFoundations/index.php?title=Technology_Integration_in_K-12

[11]Educational Reform Studies. (n.d.). *Effects of Technology on Classrooms and Students*. Retrieved November 3, 2011, from http://www2.ed.gov/pubs/EdReformStudies/EdTech/effectsstudents.html

more purpose and in a way that appears far more genuine than when they are in a regular classroom environment. In addition, the use of these integrated technologies also engages families in the student's learning. Education Week's Research Center published a study indicating that technology use "increases student engagement; promotes a continuing conversation about learning between teachers, parents, and students; and extends academic lessons beyond school walls"[12] The report suggests that teachers who embrace technology in this way enjoy the benefits of connecting with students and their families more frequently and at a far deeper level than those who do not. Given the importance of the home/school partnership in a meaningful and prioritized learning experience this has a positive impact upon the learning that takes place both inside and outside of the classroom.

With the abundance of research speaking to the positive benefits of the integration of technology into learning, it would be easy to assume that there are few barriers that stand in the way of a broad adoption of such a methodology. This is not the case however, as schools face significant barriers in the successful movement towards a technology infused classroom. Perhaps the most significant of these is the teacher's comfort with the technology that they are asked to use. Teachers have multiple concerns regarding the use of classroom technology, though the most deeply rooted is the time required to train and prepare for the new

[12]Research Center: Technology in Education. (2011, September 1). *Education Week American Education News Site of Record*. Retrieved November 3, 2011, from http://www.edweek.org/ew/issues/technology-in-education/

methodology. Clearly, if they are to feel comfortable teaching classes using this new medium, teachers must receive thorough professional development and "teachers needed extra planning time for technology."[13]In many cases the lack of training leads to a 'fear of the unknown', which, in turn, often presents itself in the form of resistance or skepticism of the new technologies. For some, this is simply that they "did not fully understand the role computers should play", and for others there was a feeling that the technology "would interfere with teacher-student relationships".[14]

Organizational change can be difficult even in the best of times, and those that attempt to integrate the ever-changing world of technology into a system founded upon a tradition such as public schools are bound to face considerable challenges. Indeed, the mere speed of the dynamic nature of technology intensifies the problems that need to be overcome. Technology changes faster than the school system can keep up and so it is inevitable that this should cause a healthy level of frustration on the part of the work force. Teachers report that they often so not know "which computer skills should be taught in school and how computers can be used for teaching and learning", and claim they "did not fully understand the role

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[13]Bauer, J., & Kenton, J. (2005). Toward Technology Integration in the Schools: Why It Isn't Happening. *Journal of Technology and Teacher Education*, *13*(4). Retrieved November 3, 2011, from http://mariaesposito.org/disseration%20docs/Technology%20Intergration/Bauer%20-%20tech%20integr.pdf

[14]Bauer, J., & Kenton, J. (2005). Toward Technology Integration in the Schools: Why It Isn't Happening. *Journal of Technology and Teacher Education*, *13*(4). Retrieved November 3, 2011, from http://mariaesposito.org/disseration%20docs/Technology%20Intergration/Bauer%20-%20tech%20integr.pdf

computers should play".[15] The reactive nature of technological change also makes it difficult to even conduct research with these concepts. Technology changes so quickly, and "studies that produce meaningful data often take several years to complete – a timeline that lags far behind the fast pace of emerging and evolving technology".[16] Realistically, many school districts simply do not have any way to acquire the depth or breadth of infrastructure required to move forward with technology at the center of the learning process. Even the White House Chief of Technology concedes that although "school infrastructure is improving, many openly doubt that capability will catch up with demand, since new digital tools used in education are requiring ever-increasing amounts of bandwidth."[17] Furthermore, in addition to the lack of infrastructure, school funding in recent years has been restricted to a point where spending levels simply will not sustain a concerted effort to infuse schools with technology. A 2011 study stated the official position of the government was as "facilitators of technology access was the best and perhaps most practical goal of the federal government in lean economic times." And yet, the federally funded Enhancing Education Through Technology program, "initially

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[15] Bauer, J., & Kenton, J. (2005). Toward Technology Integration in the Schools: Why It Isn't Happening. *Journal of Technology and Teacher Education*, *13*(4). Retrieved November 3, 2011, from http://mariaesposito.org/disseration%20docs/Technology%20Intergration/Bauer%20-%20tech%20integr.pdf

[16] Research Center: Technology in Education. (2011, September 1). *Education Week American Education News Site of Record*. Retrieved November 3, 2011, from http://www.edweek.org/ew/issues/technology-in-education/

[17] Research Center: Technology in Education. (2011, September 1). *Education Week American Education News Site of Record*. Retrieved November 3, 2011, from http://www.edweek.org/ew/issues/technology-in-education/

funded at $700 million annually but had dropped to $100 million by 2010," and was the "only federal program within the U.S. Department of Education's general funding devoted specifically to education technology." [18] Increasingly schools are looking to 'bring your own devise' policies as a cost-effective option to allow technology to be infused into each classroom without a high cost to the school or district.[19]

Beyond the obvious challenges surrounding finance and resources, concerns over inequality are also of paramount importance. There are clearly several factors that must be taken into account, but none more powerful than the argument that technology advancement is expensive and therefore has the ability to further marginalize a group of students who are already divided from their peers due to their low socio-economic status. Studies show that in 2010, while the ratio of students to computers was 24:1, for students who attended poor or high minority schools this ratio is much higher. In these areas, while 85% of schools have multi-media computers, and 64% have Internet access, only 14% actually have these computers and Internet access in the classroom.[20]Most recent research confirms this belief set, as late as March 2013, Education Week reported "Teachers of low

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[18]Research Center: Technology in Education. (2011, September 1). *Education Week American Education News Site of Record*. Retrieved November 3, 2011, from http://www.edweek.org/ew/issues/technology-in-education/

[19]Puente, Kelly. "High School pupils bring their own devices." *District Administration* Feb. 2012: 64. *General OneFile*. Web. 17 Mar. 2012.

[20]Gray, L., Thomas, N., & Lewis, L. (2010). Teacher's Use of Educational Technology in U.S. Public Schools: 2009. *National Center for Educational Statistics*, *2010-040*. Retrieved November 3, 2011, from http://nces.ed.gov/pubs2010/2010040.pdf

income students are twice as likely as teachers of upper-income students to say that their schools are 'behind the curve' in utilizing digital tools in the classroom, indicating a concern among educators about the 'digital divide' and its effects on students' academic development."[21] This is cause for alarm – one of the most compelling benefits of the arguments for integration of technology is to allow students from all backgrounds the same access to materials and an expanded educational experience. Certainly the advent of low cost tablet technology, has the ability to use devise-based applications that store materials and textbooks for students, opens the door for all students who are afforded these devises the ability to take their work and the supporting libraries anywhere they go.

The way in which technology is used by teachers within the learning process is critical to the impact it yields. Recent research conducted comparing the use of technology in the learning process of Mathematics and Science, demonstrates that efficient use of technology can be directly correlated to the achievement levels of students. The 2011 study compared the progress made by students within the United States, with those in Singapore and also looked at the ways in which technology was used in the process. Interestingly, the research also found an insignificant relationship between technology and academic achievement in U.S. schools with one explanation for this finding being that inefficient use of technology

[21] Block, M. (2013) *Pew Survey Gauges Teachers' Attitudes About Tech., Equity.* Education Week Vol. 32, No 23, March 6, 2013

in schools leads to a waste of student time and school resources.[22] Clearly, the key ingredient in the successful use of technology in school relies more upon the usage than the exposure, and it is precisely within this distinction that promoters of educational technology must build their case.

These findings were reinforced and expanded upon in a further study, indicating that even when school districts of significant wealth have an abundance of technology in the classroom, this does not necessarily translate into increased student achievement. "Students benefit from emphasizing the quality of evidence and argument, rather than the number of artifacts or frequency of communication. Teachers need to consider how core inquiry goals align with scaffolding activities to maximize student problem solving abilities."[23] There is often little direct connection between the number and amount of technology in any given classroom and the learning-based activities that are used. As such, the approach and strategies used by a teacher had more of an impact on the usefulness of the technology used, rather than the amount of technology. Studies found that "more student technology use and less teacher technology use in classrooms with an emphasis on individual student work and student-centered teacher roles. The opposite effect: less student

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[22]Al-safran, E. and Brown, D., *"The relationship between Classroom Computer Technology and students Academic Achievement",* Paper 111021, Research in Higher Education Journal,December, 2011.

[23]Kim, M. C., &Hannifin, M. J. (2011). Scaffolding 6th graders' problem solving in technology-enhanced science classrooms: A qualitative case study. Instructional Science, 39(3), 255-282.

technology use and more teacher technology use, was found in classrooms with whole-class organizations."[24]

The integration of the technological and educational worlds into one is a process that will take time, and will be significantly dependent upon the speed at which educators can increase their understanding and comfort with the emerging technologies they are expected to use. For now we must accept the fact that there remains a sizeable disconnect between the way the students are being taught in schools and the way the outside world approaches both socialization and the systems used to collect and analyze data of all types.[25] When deciding how to overcome these divides, four important aspects must be considered: (a) the context (school), (b) the innovator (teachers), (c) the innovation (technology), and (d) the operator (students). The more thoroughly these factors integrate, the greater the impact upon the learning process as a whole, and as they are increasingly used in the classroom, our ability to influence what new technologies are created and how they will be used in the future is also increasing.[26]

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[24]Bielefeldt, T. (2012). Guidance for technology decisions from classroom observation. *Journal of Research on Technology in Education*, *44*(3), 205-223.

[25]Klopfer, E., Osterweil, S. and Salen, K. (2009) Moving learning games forward: obstacles, opportunities & openness, *The Education Arcade*, available online athttp://education.mit.edu/papers/MovingLearningGamesForward_EdArcade.pdf.

[26]Klopfer, E., Osterweil, S. and Salen, K. (2009) Moving learning games forward: obstacles, opportunities & openness, *The Education Arcade*, available online athttp://education.mit.edu/papers/MovingLearningGamesForward_EdArcade.pdf.

In a 2008 study, Reigeluth and Duffy argued that three paradigm changes must occur in order for technology in schools to be genuinely transformative "(a) transforming teaching and learning to a paradigm that is customized and attainment-based, (b) transforming the school system's social infrastructure to a participatory organization design, and (c) transforming the relationship between the school system and its environment to a collaborative and proactive stance. "[27] Indeed, these paradigm shifts move far beyond the limitations of a single classroom, or teacher, and require a complete shift of thinking to take place within a school or district. It suggests that nothing less than an overhaul of the entire system will be required if technology is to truly redesign the educational process. "Even if teachers have all the knowledge, skills, attitudes, and tools they need, they will not be able to create effective learner-centered classrooms if they still have to cover a large amount of content in a short time and focus on preparing students for high-stakes tests. It appears that effective learner-centered learning experiences require all those involved with the system, including administration, parents, and students, to support the learning-focused paradigm and be willing to perform the new roles that the new paradigm requires."[28] In a natural extension, studies now extend to teacher preparation programs the same need to redefine themselves. "Teacher educators

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[27][27]Reigeluth, C &An, Y. (2011-12) Creating Technology-Enhanced, Learner-Centered Classrooms: K–12 Teachers' Beliefs, Perceptions, Barriers, and Support Needs. Journal of Digital Learning in Teacher Education, Vol. 28, No 2.

[28]Reigeluth, C &An, Y. (2011-12) Creating Technology-Enhanced, Learner-Centered Classrooms: K–12 Teachers' Beliefs, Perceptions, Barriers, and Support Needs. Journal of Digital Learning in Teacher Education, Vol. 28, No 2.

must also adapt and change and be familiar with using emerging technologies that can encourage student engagement and interactions (e.g. virtual environments, gaming technologies, and Web 2.0 tools). "[29]

As with the learning process itself, there is a considerable link between the attitudes and techniques used by the teacher and the overall success of the implementation. Research indicates, teachers' attitudes and perceptions about their teaching practices and ability, or lack thereof, to incorporate technology into the classroom is a critical factor in the achievement of students using the technology. "The beliefs and attitudes that some educators have, could impact the quality of technological support that they are providing to their students and therefore impact their students' success rates." [30] This is hardly a new phenomenon, but it is an issue that must be recognized as one that can greatly impact the outcome of the experiment. In many cases, rather than the technology or the learner being the primary reason for a lack of growth, the teacher involved in the classroom plays a far more influential role. For this reason, the way that teachers interact with and feel towards the technology used is a primary factor to consider. A 2012 study, argued for the inclusion of student voice as a valid means of identifying 21st century

[29]Wright, V. & Wilson, E. (2011) Teachers' Use of Technology: Lessons Learned from the Teacher Education Program to the Classroom. *Journal of the Southeastern Regional Association of Teacher Educators.* Vol. 20, No. 2. Summer 2011

[30]Reigeluth, C &An, Y. (2011-12) Creating Technology-Enhanced, Learner-Centered Classrooms: K–12 Teachers' Beliefs, Perceptions, Barriers, and Support Needs. Journal of Digital Learning in Teacher Education, Vol. 28, No 2.

pedagogical approaches to learning – as a direct measure to counteract any potential teacher bias. The findings of the study, indicate that students expect to use a variety of technologies in their learning, just as they use technologies in their everyday lives outside of school. The research clarifies what a learning environment might look like and what teaching strategies and technologies would engage and help promote student achievement, arguing that, "… it is ironic that teachers insist on students learning from them, but they rarely take time to learn from students" [31]

In 2009, research conducted by Johnson, Sullivan, and Williams, illustrated the importance of incorporating new technologies in the classroom. The study, conducted research into the life of six primary school classrooms, and supported the value of new technologies as methodological tools, to help enhance the overall classroom environment.[32] The type and variety of technology used in the learning process has also been seen to have an effect, especially on the students who are involved in the experiment. While there is little tangible evidence that the students make significantly more gains in terms of their achievement as measured on standardized tests, research has consistently demonstrated an increase in student engagement and motivation. In an in-depth look at animation, text, audio, video,

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[31] Sweeney, T. & Geer, R. (2012) Contemporary Learning with ICT. ACEC2012: ITs Time Conference. Perth, Australia. October 2012

[32] Johnson, B., Sullivan, A. & Williams, D. (2009) A one-eyed look at classroom life: Using new technologies to enrich classroom-based research. Issues In Educational Research, Vol 19(1), 2009

slideshows, podcasts, instant messaging, and simulations, research has shown that multimedia has a positive influence on the effectiveness of the Internet, used in the classroom. When trying to understand the variety of ways technology can be used in the classroom the most important factor is determining the quality of engagement level within the room and is in many ways directly related to a number of educational benefits ranging from increased motivation and time on task, to better levels of classroom management.[33]

In an article that focuses on middle school students' use of technology, the attributes of technology integration are highlighted – based upon the assumption that if they are spending a good majority of their time outside of school engaged in technology use, then this same use needs to transfer to the classroom. "The reason American's school children are not learning what we want them to learn is that in too many instances they are being asked to do things they do not as worth doing in order to learn things adults want them to learn".[34]

One of the most significantly reported benefits of the increased use of technology in schools is that it connects students, teachers and parents both inside and outside of the school day. Learning communities have always been an integral

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[33] Courts, B. & Tucker, J. (2012) Using Technology To Create A Dynamic Classroom Experience. Journal of College Teaching & Learning, Vol. 9, No. 2 Second Quarter 2012.

[34]Downes, J. &Bishop, P. (2012), Responsive Technologies for Young Adolescents, in Fayneese S. Miller (ed.) *Transforming Learning Environments: Strategies to Shape the Next Generation (Advances in Educational Administration, Volume 16)*, Emerald Group Publishing Limited, pp.153-169

part of a successful classroom and communicating with parents is a critical aspect of good schools. A 2006 study, illustrates "how students may construct communities of learning that transcend the traditional teacher-driven discourse in classrooms."[35] Increased use of technology is creating a way for communities to form through the use of the Internet and digital media, and seamlessly expands the learning process beyond the confines of the school day. Students and parents, in many cases, now have access to their education twenty-four hours a day and seven days a week. While this places an increased stress on teachers to be "available" at all times, an increased understanding of multiple forms of technology and how it can be used to connect with families is becoming an additional requirement for many professional educators. In a recent study, when asked "67% say the internet has a "major impact" on their ability to interact with parents and 57% say it has had such an impact on enabling their interaction with students."[36]

Most schools across the country still ban cell phones in their buildings and in doing so serve as the very foundation of the argument made by those who are calling for a much needed paradigm shift; a shift that has begun to take place, and that is likely to gain rapid momentum in coming years. While it is true that schools

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[35]Grisham, D. & Wolsey, T. (2006) Recentering the Middle School Classroom as a Vibrant Learning Community: Students, Literacy, and Technology Intersect. Journal of Adolescent & Adult Literacy Vol. 49, Issue 8, PP. 648–660, May 2006

[36]Purcell, K., Heaps, A., Buchanan, J. & Friedrich, L. (2013) How Teachers Are Using Technology at Home and in Their Classrooms. Retrieved from: **http://pewinternet.org/Reports/2013/Teachers-and-technology.aspx** February 2013

remain reticent to embrace the full depth of technological possibilities available to them, an increased use of technology in learning is being experienced in most schools. Research indicates that we are rapidly approaching the time when "each and every student will have at least one mobile computing device (e.g., smartphone, media player) with them at all times."[37] Provided that schools can overcome the financial challenges that result in a significant limitation to the amount of technology access available for students, then the benefits are clear. These financial limitations remain the most prominent challenge for many schools who are not addressing this issue at the present time, instead prioritizing other needs. Nevertheless, allowing students to use their own devices is highly likely to lead to "improved student achievement, and that means happier teachers, parents, school boards—and students."[38]

The greatest challenge that school district's face when implementing a "bring your own device" (BYOD) system is the need to develop formal policies and procedures regarding the use of the devices. This is a new and intricate challenge for districts as it requires an understanding that the device is the property of each individual student and yet the network or connection that is being used will still belong to the school or district. Policies must be very clearly outlined and students

[37]Norris, Cathleen, and Elliot Soloway. "From banning to BYOD: this inevitable shift is at the heart of school change." *District Administration* May 2011: 94. Academic OneFile. Web. 17 Mar. 2012.

[38]Norris, Cathleen, and Elliot Soloway. "From banning to BYOD: this inevitable shift is at the heart of school change." *District Administration* May 2011: 94. Academic OneFile. Web. 17 Mar. 2012.

and parents must be educated to understand exactly what they entail. This will involve a consent form signed by each parent/student stating that they agree to use their own devices, but must do so by the policies set forth by the school. Associated consequences should also be in writing. A school must also protect themselves through the use of teacher training, network capacity, and lost, stolen, or damaged student property.[39] Most districts develop policies that require students to follow rules insisting the devises only use district networks to connect to the internet. Provided that students use this network access, and that the devises are using school-approved software or applications, then controls can be put in place to protect both those using the devises and the schools in which they are being used.[40] When a student is using a personal device at school, especially a smartphone, and they are required to use the school's wireless internet and not their wireless provider's data connection it allows the school to filter or block any of the Web content that students should not have access to or need to be protected from. The school can then also monitor the websites visited so that they know what sites are being accessed by students while they are in school. Bandwidth can be limited to

[39]Harris, Christopher. "Going mobile: key issues to consider for schools weighing BYOD." *School Library Journal* Jan. 2012: 14. *Academic OneFile*. Web. 18 Mar. 2012.

[40]Norris, Cathleen, and Elliot Soloway. "Tips for BYOD K12 Programs: critical issues in moving to 'bring your own device'." *District Administration* July-Aug. 2011: 77. *Academic OneFile*. Web. 18 Mar. 2012.

this connection if needed so that students are not streaming music or videos to their phone or other device which would slow down the connection for other users.[41]

As with the broader conversation about the use of technology in the classroom, a BYOD policy has a series of challenges that merit considerable discussion. The key element remains the parity of the experiment. What about those students who cannot afford the devises that their peers have? With such an emphasis being placed upon high cost technology, the achievement gap has good potential to grow rather than be closed. More importantly, "when students and their families are responsible for acquiring equipment, corners will be cut, and every configuration will be different."[42] This is obviously hard to control and maintain, and there will always be the possibility that the educational achievement gap expands.

The recent trend in technology use within the learning process has seen multiple new initiatives emerge, but none more prominently than 'Blended Learning'. The concept, although still being fully defined, involves the use of technology both inside and outside of the classroom to 'blend' more traditional teacher-delivered instruction, with the use of online resources used in the classroom on a regular basis. At this stage the majority of commentary surrounds the concept itself. "Most of the seminal work in blended learning to this point has

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[41]Ullman, Ellen. "BYOD and Security: how do you protect students from themselves?" *Technology & Learning* Mar. 2011: 32+. *Gale Power Search*. Web. 17 Mar. 2012.

[42]Pettit, Mark. "Tech support reality check." *Learning & Leading with Technology* Feb. 2012: 8. *Expanded Academic ASAP*. Web. 18 Mar. 2012.

not been empirical in nature, but rather has focused on definitions, models, and the potential of blended learning. This is natural for the early stage of blended learning research, especially where there is competition for time between design, development, and research."[43] More importantly, there seems to be little evidence of a consistent and easily understood definition of blended learning, and so any option including an online approach has the tendency of being categorized as a "blended" approach.

Online education takes many forms and is equally difficult to define with any focus or clarity. What is not in doubt is the fact that the use of online courses is on the rise and that for many the future of education is likely to include a combination of online and face-to-face instruction.

> "They vary in structure, and may be managed by a state, district, university, charter school, not-for-profit, for-profit, or other institution. Thirty states and more than half of the school districts in the United States offer online courses and services, and online learning is growing rapidly, at 30% annually. This growth is meeting demand among students, as more than 40% of high school and middle school students have expressed interest in taking an online course."[44]

As the use of these online courses increases, so too does the research and data collection, which is now resulting in the development of a better understanding of the concept within the field. In fact: "The most well established K-12 online

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[43]Halverson, L. R., Graham, C. R., Spring, K. J., & Drysdale, J. S. (2012). An analysis of high impact scholarship and publication trends in blended learning. *Distance Education*, Vol. 33, No. 3.

[44]Watson, J. (2011). Blended Learning: The Convergence of Online and Face-to-Face Education. North American Council for Online Learning.

learning programs are more than ten years old, and many programs have between five and ten years of operating experience. The newest programs are building on the expertise of those early adopter."[45] Interestingly, due to the fact that the types and variety of online programs is extensive, only now, almost a decade after its initial adoption, are we beginning to see a sizeable body of knowledge emerges, with concrete skills and practices.

Defining blended learning remains problematic therefore, and so, for many, any learning experience that involves the use of technology within the process will be included within the umbrella of the term. Certainly most would agree, the concept involves the integration of face-to-face instruction with "other strategies" that allow for the teacher to play a less central role in the learning process. This combination of multiple approaches primarily uses virtual resources and therefore the vast majority of blended learning projects include a significant amount of the instruction to be delivered through the use of technology. In most cases the 'blend' of learning will be somewhere along a continuum of technology use in the classroom as a percentage of the instruction as a whole. The exact amount and type of instruction that is delivered in each format is solely dependent upon the teacher, and presumably the best instructional practices for any given class. Clearly precision in defining blended learning can be a challenge, but does not mean that there are not

[45]Watson, J. (2011). Blended Learning: The Convergence of Online and Face-to-Face Education. North American Council for Online Learning.

common factors associated with the concept. "Blended learning should be viewed as a pedagogical approach that combines the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment, rather than a ratio of delivery modalities. In other words, blended learning should be approached not merely as a temporal construct, but rather as a fundamental redesign of the instructional model with the following characteristics:

- A shift from lecture- to student-centered instruction in which students become active and interactive learners (this shift should apply to the entire course, including face-to-face contact sessions);
- Increases in interaction between student-instructor, student-student, student-content, and student-outside resources;
- Integrated formative and summative assessment mechanisms for students and instructor."[46]

Given the lack of clarity, and the broad spectrum of approaches that can be identified as blended learning, it is likely that in the coming years instructional strategies that are blended will become commonplace in schools. It is true that this will be witnessed far more within higher education than it is K-12, where the

[46]Dziuban, C., Hartman, J., Moskal, P., "Blended Learning," EDUCAUSE Review, Volume 2004, Issue 7, 2004

adoptions of new and innovative practices are far more welcome. Nevertheless, According to Staker and Horn, 2012, ultimately,

> "Blended learning at the K–12 level is likely to become even more important than it has been in higher education because of a culture in which school provides not only academic instruction but also the physical monitoring of students while parents work; many current K–12 blended learning environments do not reduce seat time (an almost fundamental component of some definitions of blending), but continue the supervisory role while engaging students in online activities, small-group work, whole-class instruction, and one-on-one tutoring."[47]

It is timely, therefore, that schools and districts begin to collect data regarding the potential benefits of learning in a blended format, and the associated components witnessed when adopting this methodology. This is also a complicated process for researchers and those seeking empirical evidence of tangible benefits, as no two experiments are likely to be the same, and therefore absolutes become very difficult to determine. We remain at the very forefront of the larger experiment of blended learning, and would be wise to remain cautious about the findings from those early adopters who are unlikely to mirror the characteristics of the masses in terms of their expertise or even comfort regarding the use of technology in the classroom. Picciano et al (2007) predicted such an increase as early as 2007 when their research indicated that, "in coming years there is likely to be a significant

[47]Halverson, L. R., Graham, C. R., Spring, K. J., & Drysdale, J. S. (2012). An analysis of high impact scholarship and publication trends in blended learning. *Distance Education*, Vol. 33, No. 3.

increase in the amount and type of blended learning programs adopted in K-12 classrooms across the country. It also indicates that an additional 27.1% of those who did not have any students enrolled in a blended course planned to have at least one student take a blended course within the next three years. Nearly two thirds of all districts (63.1%) currently have students taking either online or blended courses with another 20.7 percent planning to introduce them over the next three years. This data clearly reflects that the majority of American school districts are providing some form of online learning for their students and many more plan to do so within the next three years. The results indicate that the perceived importance of online learning related mostly to the following:

1. Offering courses not otherwise available at the school
2. Meeting the needs of specific groups of students
3. Offering Advanced Placement or college-level courses
4. Reducing scheduling conflicts for students
5. Permitting students who failed a course to take it again"[48]

One of the most fundamental tenants of blended learning according to proponents is that it brings an aging education system into the modern world. "You

[48]Picciano, A. G. & Seaman, J. (2007). K-12 Online Learning: A Survey of U.S. School District Administrators. *The Sloan Consortium; Needham, MA.*

can't provide a 21st century education without using 21st century tools."[49] Liz Pape, President and CEO of the Virtual High School Global Consortium, notes that blended learning is merely an extension of the toolkits available to teachers in the classroom. "In the past, the student 'toolkit' has "consisted of notebooks, paper assignments and 'stand and deliver' classroom presentations". Blended learning adds online tools in to those 'toolkits. This "expanded toolkit helps students better develop their higher education and workforce skills" as well as "developing critical thinking, problem solving, communication, collaboration, and global awareness."[50] In addition to playing the role of an additional resource for teachers, Pape also found that this use of technology, "extends the school day or year and [develops] the 21st-century skills students' need", as well as playing "to students' different learning and communication styles, ultimately engaging them more in their learning."[51]

The critical component of a modern education system is the ability to use the innovative technologies available to us, in order to genuinely meet the needs of all students. This might allow for the genuine differentiation of educational services that research has indicated is the key to a great educational product. The question remains whether or not teachers can differentiate in this way better with added

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[49]Stackpole, Robert. "You can't cheat at critical thinking." *Learning & Leading with Technology* Feb. 2012: 8. *Junior Edition*. Web. 18 Mar. 2012.

[50]Pape, L. (2010). Blended Teaching and Learning. *The School Administrator*, *67*(4), 16-21. Retrieved November 3, 2011, fromhttp://www.aasa.org/SchoolAdministratorArticle.aspx?id=12924

[51]Pape, L. (2010). Blended Teaching and Learning. *The School Administrator*, *67*(4), 16-21. Retrieved November 3, 2011, fromhttp://www.aasa.org/SchoolAdministratorArticle.aspx?id=12924

technology, or without it? According to Drysdale et al (2012) high school students have needs and abilities that are very different from higher education students where most of the research has occurred, but as schools move forward with blended learning and research in this area increases, better blended environments will be established and therefore better results can be expected.[52] At the same time, the ability for schools to deliver a truly individualized curriculum, has never been better, due, in most part, to the use of educational technologies that are intuitive in nature and can guide students through the learning process at their own pace and given their own specific learning needs and styles. Indeed the real potential of blended learning classrooms lies in the possibility of offering "A more consistent and personalized pedagogy that allows each student to work at her own pace and helps each child feel and be successful at school. Leveraging technology, blended-learning programs can let students learn at their own pace, use preferred learning modalities, and receive frequent and timely feedback on their performance for a far higher quality learning experience." [53]

In research conducted by Picciano in 2009, this concept was investigated further in the form of a look at a Multimodal form of learning for students. This approach blends the learning that takes place in the classroom with the specific

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[52]Drysdale, J. S., Graham, C. R., Spring, K. A., & Halverson, L. R. (2012). An analysis of research trends in dissertations and theses studying blended learning. *Internet and Higher Education*, accepted for publication 15 November 2012.

[53]Horn, M. B. &Staker, H. (2011). The Rise of K-12 Blended Learning. *The Innosight Institute*.

purpose of addressing the differences within the students in the class and attempting to tailor the learning process to match the unique nature of the learner. It speaks to the greatest potential of a blended experience as it:

> "Recognizes that because learners represent different generations, different personality types, and different learning styles, teachers and instructional designers should seek to try to use multiple approaches including face-to-face and online technologies to meet the needs of a wide spectrum of students. Furthermore, it posits that a major benefit of multiple modalities is that they allow students to experience learning in ways in which they are most comfortable, while challenging them to experience and learn in other ways as well. Finally, critical to this model is the concept that academic program and course goals and objectives drive the pedagogical approaches and technology used, and not the other way around."[54]

Earlier studies from the same researcher indicated that there was a large a varied set of explanations as to why a blended approach in the classroom was an attractive option for both students and teachers. "Some were making up lost credits, some were taking AP classes not offered at their own school, and others were trying to get extra credits to graduate early. Still others would take a reduced schedule at their home school and leave early enough in the day to go to a job while making up the online time at their convenience."[55] The feedback from those who participated included:

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[54]Picciano, A. G. (2009). Blending With Purpose: The Multimodal Model. Journal of the Research Center for Educational Technology. Vol. 5, No. 1.

[55]Picciano, A. G. & Seaman, J. (2007). K-12 Online Learning: A Survey of U.S. School District Administrators. *The Sloan Consortium; Needham, MA.*

"'We only use online courses to enable students to gain credits who otherwise would be unable to graduate with their classmates due to schedule constraints. '

'We offer online courses for remedial purposes and the occasional homebound student.'

'Our blended online program is increasing most significantly with our ELL population and our contract alternative schools.'

'The students … take summer courses, mainly in mathematics, from universities such as Stanford to allow them to fulfill a required course… It allows them to take more advanced courses during their 4 years of high school.'

'We're looking into serving kids who have (a) failed a requirement, rather than re-enrolling them in an on-campus course, (b) selected electives, and (c) Advanced Placement offerings where the local enrollment is too low to warrant an on-campus teacher.'

'We use online course work for students who miss school to the point of no longer being able to pass the regular class.'"

'Many students are enrolled in dual credit college credits through high school regional academies; this is the fastest growing area of course offerings for our students.'

'Blended courses give [us] the opportunity to offer advanced and remedial classes we cannot provide.'

'It meets the needs of a few students that have mastered our 8th grade curricula and are taking advanced high school courses, especially in mathematics and world languages.'

'Online courses have helped especially with students who either want to go ahead in their learning or those who need to repeat courses.'"[56]

[56]Picciano, A. G. & Seaman, J. (2007). K-12 Online Learning: A Survey of U.S. School District Administrators. *The Sloan Consortium; Needham, MA.*

and clearly demonstrates that, at least in its early inception, the predominant reason for blended learning is to meet the individual needs of the many students who do not fit comfortably into a system that has been prepared for the majority rather than for individual need.

Picciano's latest research further confirms the earlier work. In a 2010 study, data collected indicated that, "online and blended learning are becoming integral to a number of high school reform efforts, especially with regard to improving graduation rates, credit recovery, building connections for students to their future college careers, differentiating instruction, and supporting cost-efficiency for instruction."[57] This was not the only finding of the research however, as the study also indicated that schools have also used the increased acceptance of a blended model to jump start other educational initiatives. "There is also interest in the role that online learning can play in high school reform especially with regard to improving graduation rates, building connections for high school students to college careers, differentiating instruction, and supporting cost-efficiency for instruction."[58]

As with many new phenomena, blended learning has, for some, become a catalyst that has increased efforts to redefine the teaching process as a whole, and

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[57]Picciano, A. G., Seaman, J., Shea, P., Swan, K. (2011). Examining the Extent and Nature of Online Learning in American K-12 Education: The research initiatives of the Alfred P. Sloan Foundation. *Internet and Higher Education*, Vol. 15, 127-135.

[58]Picciano, A. G., Seaman, J., Shea, P., Swan, K. (2011). Examining the Extent and Nature of Online Learning in American K-12 Education: The research initiatives of the Alfred P. Sloan Foundation. *Internet and Higher Education*, Vol. 15, 127-135.

not merely to integrate new technologies into the system. In the 2011 research, conducted by the Innosight Institute, many of the unintended benefits of blended learning surfaced as some of the most compelling consequences of demonstrating a willingness to be an early adopter. "As online programs capture student achievement data in real-time across the school, teachers can spend more time helping personalize learning for students. Productive new school models that require fewer, more specialized teachers and use space more efficiently. Schools can leverage technology to create radically different staffing structures that increase school-wide student-teacher ratios, even as students experience more personalized learning from more effective teachers. Leveraging technology in this way changes the assumptions of the traditional school model… Blended learning's potential: Personalize learning, Boost productivity."[59]

One of the most apparent domino effects of blended learning is the impact that it has had on the classroom spaces where the learning takes place. Blended learning… is now having an impact on how new school buildings are designed and how current ones are being redesigned."[60] These spaces are defined by the fact that they maximize flexibility, and at the same time they encourage collaboration between students. Classrooms are redesigned to allow for multiple small group sessions to be able to occur at the same time and in the same space. With students

[59]Horn, M. B. &Staker, H. (2011). The Rise of K-12 Blended Learning. *The Innosight Institute*.

[60] Ash, K. (2013) Spaces for Blended Learning. *Education Week: Technology Counts.* Vol. 32 No. 25 March 14, 2013

spending up to a third of their time involved in experiential learning activities, there is no longer the need for them to be sitting at single desks in rows, facing the front. Rather classrooms are now set up to allow students to interact using both individual and collaborative technology stations. Larger rooms that have different types of learning areas are becoming frequently associated with blended learning, and as one of the most visible differences from a traditional room, they are quickly seen as a visual representation of the different approach. According to Curtis J. Bonk, a professor at Indiana University, "Blended learning will allow students to attend a physical school space only when they absolutely need to, which will most likely be for collaborative and hands-on projects… It'll place an emphasis on social exchange, problem-solving, and trying things out in new ways."[61] This does not mean however, that transformation of this type are universally well received. Philip Long, the director of the Center for Educational Innovation and Technology, at the University of Brisbane, claims that "while having flexible and adaptive space is important to accommodate different styles of learning and changes in technology, it's equally important to make sure those spaces fulfill their intended purposes well. 'There's a fine line between flexible and useless… we have typically fallen into the trap of building boxes that try to be flexible, but in reality do nothing well'"[62]

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[61] Ash, K. (2013) Spaces for Blended Learning. *Education Week: Technology Counts.* Vol. 32 No. 25 March 14, 2013

[62] Ash, K. (2013) Spaces for Blended Learning. *Education Week: Technology Counts.* Vol. 32 No. 25 March 14, 2013

Interviews conducted within a 2010 study, with the emerging blended-learning operators confirm the fact that blended learning has several challenges that need to be resolved before any prototype can be declared to be successful. The discussion surrounding this educational transformation "makes it clear that the raw functionality they need from online products is still lacking. Even more problematic is that the available offerings and different systems are not well integrated; as a result, the different products don't "talk to" and sync well with each other."[63] While it would be usual for innovation to bring with it unforeseen challenges, and that in any early adoption there is an acceptable level of resistance from those who remain skeptical, nevertheless blended learning brings with it many of the potential pitfalls of technology use in the learning process generally. Parallel to the research conducted indicating that the use of technology can increase rather than decrease the achievement gap, for some, the worst of blended learning includes the possibility of increasing an educational divide that has been troublesome for decades. "The data clearly indicates the existence of the digital divide, which identifies those countries where students have little or no access to technology devices or the Internet outside of the school setting; however, there are some reports indicating the frustration of the digital native who has personal access to mobile smart technologies and who is ultimately more ready than the schools or

[63]Picciano, A. G., Seaman, J. & Allen, I. E. (2010). Educational Transformation Through Online Learning: To Be or Not To Be. *Journal of Asynchronous Learning Networks*, Vol. 14, Issue 4.

educators to learn in an online or blended environment. It is this data that will drive the vision for the future of online and blended education. As in many other industries, the public demand for a product may actually serve as a catalyst for systemic change. If today's K-12 students begin to challenge the system as it exists, and demand more online classes and ease of access to online resources, they will prove to be an effectively disruptive force, creating a change from the inside at a rapid pace."[64]

Interestingly, even though it could be assumed that online courses actually present students with enough anonymity to overcome potential equity issues. If the system establishes that it is not possible to determine a student's race, color, socio-economic status, or even gender, then it would be difficult for even subconscious discriminations to be evident. However, research has indicated that cultural gender and ethnic differences in online education are indeed apparent. "Students are used to seeing each other and are curious, so it's not surprising to find them asking for photographs of classmates. With the popularity of social networking sites, students have a variety of ways to see images of classmates. A number of virtual education programs allow or encourage students to post photographs while other programs encourage the use of icons instead of actual photographs. Does the lack of student images or the use of icons or photographs change the way students interact with

[64]Barbour, M., Brown, R., Waters, L. H., Hoey, R., Hunt, J. L., Kennedy, K., Ounsworth, C., Powell, A., &Trimm, T. (2011). Online and Blended Learning: A survey of policy and practice of K-12 schools around the world. *International Association for K-12 Online Learning and the North American Council for Online Learning*.

each other? Does it change the instructor's perceptions of individual students? This is an area ripe for additional research. While there has been little research into cultural, gender, and ethnic differences in virtual school education, the subject of different treatment and behavior in other online situations predominantly."[65]

Online equity must also address the basic access issues as a part of the equity conundrum. Especially given the research indicating that the vast majority of blended learning is used to serve those students who are outliers on the educational continuum, it is imperative that all students who might benefit from such options have the ability to do so – if we are to claim that the system is equitable. In addition to students who might be marginalized for the variety of cultural, ethnic, socio-economic and gender issues, when dealing with a methodology that is primarily technology based there is a need to think of those who, for whatever reasons, do not have access to the Internet away from school. While this can be overcome to some extent through the use of applications that might be downloaded to devises that are already content full, the issue remains a critical one for many students and in many, financially challenged school districts. In fact, this emerging realization has led to a redefinition of the digital divide. "When we refer to online equity, we're not talking about the digital divide, though there are elements of the digital divide discussion in this view of online equity. The digital divide discussion initially focused on which

[65]Rose, R. M. &Blomeyer, R. L. (2007). Research Committee Issues Brief: Access and Equity in Online Classes and Virtual Schools. *The North American Council for Online Learning*.

students had access to computers in school, characterizing them as the haves and have-nots. As the numbers of computers became less an issue, the discussion shifted to the issue of access to the internet. The digital divide has now been refined to look at high-speed access to the internet. Public school programs that take the position students must have their own appropriate technology to access educational programs are creating problems for themselves. It's incumbent on public schools are obligated to ensure that all students can take advantage of and benefit from the particular services and programs they provide."[66]

The International Association for K-12 Online Learning examined data in 2011 indicating that "the numbers of students taking courses online and the geographic areas in which they reside indicates that the major factor at this time is a socioeconomic one. At one end, there are those countries that do not permit the use of online classes for general education purposes, restricting the use of online education to students with special needs, students who are traveling, and students with other similar extenuating circumstances. In those countries where online education is accepted and indeed encouraged, access to this resource may not always meet the demands from the students."[67] In addition to the inequity of each

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[66]Rose, R. M. &, R. L. (2007). Research Committee Issues Brief: Access and Equity in Online Classes and Virtual Schools. *The North American Council for Online Learning*.

[67]Barbour, M., Brown, R., Waters, L. H., Hoey, R., Hunt, J. L., Kennedy, K., Ounsworth, C., Powell, A., &Trimm, T. (2011). Online and Blended Learning: A survey of policy and practice of K-12 schools around the world. *International Association for K-12 Online Learning and the North American Council for Online Learning*.

individual circumstance, family, or school, the adoption of blended learning also challenges the equity of the system as a whole. Local, regional and even national inequalities are now called into focus, and will need to be addressed and potentially closed as a result before there is likely to be a universal acceptance of the concept internationally.

Anthony Picciano and Jeff Seaman are the predominant authorities when it comes to research regarding online learning and blended/hybrid learning. Their work has been definitive in chronicling the journey made in the adoption of digital learning. As they observe, "online learning in K-12 schools is in its beginning stages and a good deal more public policy development at all governmental levels (federal, state, local) needs to be done in order for online learning to take a strong foothold upon which transformation can take place. Furthermore, blended approaches that combine online with face-to-face instruction whether at the program, course, or module level will likely be more readily accepted than fully online programs."[68]

What is most apparent, however, is that in order for blended learning to be as successful as its potential suggests, there must first be a sizeable paradigm shift in the way that learning takes place, and more importantly, the way that teachers approach their task. Clearly, the technologies, and the early adopters are poised and ready for this mental shift, but without it varied and numerous barriers remain very

[68]Picciano, A. G., Seaman, J. & Allen, I. E. (2010). Educational Transformation Through Online Learning: To Be or Not To Be. *Journal of Asynchronous Learning Networks*, Vol. 14, Issue 4.

firmly in place. Issues regarding the quality of online learning and the level of effect required to develop and teach online courses continue to be of concern at all levels of education leading to the conclusion that more developmental work needs to be done. As Christensen et. Al. and others have stated, there needs to be a cultural shift in pedagogical approaches that takes advantage of the newer online technologies. Only then can a widespread transformation occur… "For an overall transformation to occur online education will need to be embraced by the full range of institutions. This will demand fundamental changes in some very strongly-held beliefs among particular schools; an unlikely prospect."[69]

[69]Picciano, A. G., Seaman, J. & Allen, I. E. (2010). Educational Transformation Through Online Learning: To Be or Not To Be. *Journal of Asynchronous Learning Networks*, Vol. 14, Issue 4.

CHAPTER THREE

Method

Introduction

According to Penn State University, a blended learning approach combines face-to-face classroom methods with virtual activities to form an integrated instructional approach. There is little consensus on a single agreed-upon definition for blended learning. In addition, the terms "blended," "hybrid," and "mixed-mode" are used interchangeably in current research literature.

The goal of a blended approach is to join the best aspects of both face-to-face and online instruction. Classroom time can be used to engage students in advanced interactive experiences. Meanwhile, the online portion of the course can provide students with multimedia-rich content at any time in the day; anywhere the student has internet access, from computer labs, the coffee shop, or the students' homes. This allows for an increase in scheduling flexibility for students.

There are no rules in place to prescribe what the ideal blend might be. The term "blended" encompasses a broad continuum, and can include any integration of face-to-face and online instructional content. The blend of face-to-face and online materials will vary depending on the content, the needs of the students, and the preferences of the instructor.

Creating high-quality blended instruction can present considerable challenges. Foremost is the need for resources to create the online materials to be used in the courses. Materials development is a time and labor intensive process, just as it is in any instructional medium. In addition, blended instruction is likely to be a new concept to many students and faculty. Instructional designers involved in course development or redesign will need to be able to answer questions and increase comfort levels of all concerned.

Reflexivity

Lawrence Public Schools serve approximately 11,000 students from pre-kindergarten through grade 12 in Lawrence, Kansas. Located off Interstate 70, about half-way between Topeka and Kansas City, Lawrence is an academic community, home to the University of Kansas and Haskell Indian Nations University. The district is the seventh-largest in Kansas, and with nearly 1,700 employees, one of the city's largest employers.

Within the district, there are twenty-one school campuses. A pre-K program, 14 elementary schools (grades K-5), four middle schools (grades 6-8), two comprehensive high schools (grades 9-12), a K-8 virtual school and a virtual high school (grades 9-12). These schools span a wide variety of racially and socially diverse populations, and allow for the district to house distinctly different types of

schools. The demographic information across the district shows,70% of the students are classified as White, while students of color make up the remaining 30% as follows: American Indian/Alaskan Native – 5.2%; Asian – 4.9%; Hispanic – 7.5%; African-American – 7.1%; and Multi-Racial – 4.8%. The district also services the needs of a student population that is made up of 51% Male; 49% Female, Students with Disabilities – 12.2%, English Language Learners – 7.5%, and Economically Disadvantaged – 35.4%. Naturally, these statistics are district-wide and so vary widely from the individual circumstance of each school. For example, while the district figures show, 35% of students come from disadvantaged backgrounds, this number is as high as 75% in some schools and as low as 9% in others.

The Teaching and Learning Division within the district takes charge of the district's curriculum and instruction needs from the selection and support all curriculum, as well as the instructional methods utilized throughout all schools. The division includes all student services, other educational programs (including Adult Education, Juvenile and Adult Jail Services, GED Programs and Virtual Education), technology, and students with special educational needs. The division houses all Curriculum Specialists, Instructional Coaches, Division Directors and Assistant Directors, and is led by the Assistant Superintendent of Teaching and Learning. In addition to the oversight of all district curriculum and resources, the division also takes responsibility for Professional Development in all schools and the coaching of

all teachers. Principals also have access to the mentoring of a district liaison – an individual appointed from Teaching and Learning to act as an additional administrative support in case of need.

Purpose

At the beginning of the 2012-2013 school, the Teaching and Learning division was charged with the task of defining the future of the instructional model within the district as it pertains to the use of technology. It was determined that the best way to do this was to conduct a field study to determine the best way to proceed. The concept involved seeking a learning management system that could provide the foundation for the build out of course shells that would include all relevant materials for teaching. At the same time, the design would allow for the development of classrooms at all levels of the district to see how the concept of blended learning might be successful. This would allow for data to be collected determining the potential of such an approach, as well as information regarding whether or not a district-wide adoption would be a feasible option.

The Lawrence School District employs more than 1,700 staff, most of whom are teachers. This results in a yearly turnover that can exceed 100 new faculty members each year. This, in turn, requires the district to be able to have a powerful program of induction each year, and a need to have a structure established within the curriculum that helps new teachers to the district get up to speed quickly. It is

imperative that the district establish a foundation of course shells that helps teachers as they come in to the district by giving them a totally comprehensive set of resources to teach. This will allow teachers to meet a baseline standard of planning, assignments, and assessment without actually having to build their course – merely modifying a pre-approved template developed by master teachers in the district.

The District was also looking at the implementation of the Kansas Common Core Standards during the 2013-2014 school year and in anticipation of the adoption, the Teaching and Learning division was looking to conduct a full needs assessment as to the best instructional strategies to for implementation. The field study offered an opportunity to investigate some of the best strategies for delivering the Common Core Standards, and at the same time allowed the flexibility to look more broadly at effective instruction within the classroom. At the same time, the study allowed for the collection of data regarding teacher readiness to adopt 21st century teaching methodologies, whatever that might be determined to be!

Research Design and Procedures

An elaborate selection of criteria was established to select the classrooms and teachers for the field study. In order for the data to be most useful it was critical to ensure schools, teachers and classrooms were selected so that the broadest possible data could be collected. This demanded a careful and well-detailed selection criteria was established for a variety of elements within the field study. The first of these,

was the determination of the school site. While this was initially based upon a voluntary basis (only those principals who wished to be a part of the field study were considered), beyond this, schools were invited to participate based upon the following:

- Authentic representation of the array of demographics
    - Size of School
    - Existing programs in building
    - Percentage of SES in each building
    - Geographic Location
    - Grade Level
    - Content Area
- Importance of representing the 4 core contents
    - Representative of Sites in Each Configuration
        - 14 Elementary Schools
        - 4 Middle Schools
        - 2 High Schools

Beyond the school selection the selection of individual teachers was equally important. Once again, the initial selection was made based upon teachers volunteering and principals selecting who they felt would be the best for the field

test. However, there were a series of other criteria that were taken into account when deciding upon the teacher and classroom selection. These included:

- Race
- Grade Level
- Number of Years in Profession
- Gender
- Core content area
- Established classroom environment
- Willingness to participate
- Commitment to dynamic instructional change
- Teaching and Learning observation of the established classroom environment

The final selection that needed to be made prior to the beginning of the field test, was the learning management system that was to be used. It was initially decided to use one single universal system rather than a variety in order to maintain a consistent approach across grade levels. The team reviewed several potential platforms including: Blackboard, Moodle, Canvas, Edmodo, and Skyward. This process involved invitations for each of the systems to present to a panel of teachers and administrators in order to select the best suited for the field test. The learning management system selection criteria also included:

- open-source
- cost
- functionality
- customizability
- user-friendliness
- IT compatibility
- customer support
- responsiveness

Description of Measures

In order to ensure the data collected was truly useful, all participants voluntarily contributed to all surveys, and at no time was it possible to determine which students, teachers, or administrators did or did not answer the surveys sent out. All surveys were distributed through an external link, therefore allowing participants to freely answer without the need for them to self-identify in any way. While some of the questions allowed the researchers to determine a little demographic information about the respondents, no questions were mandatory for the survey to be completed and participants were encouraged to answer only what they felt comfortable with.

Surveys were offered to students and teachers within the study at the end of each month in order for the data trend to be collected along with the individual, month-by-month collection. This data was collated as an averaged score as well as looking for differentiating factors in feedback over the course of the semester-long study. The idea was to enter into the field test with no set hypothesis for many of the elements, rather to simply see what feedback would be elicited from those who were experiencing the blended learning.

Validity and Reliability Approaches

Given the informal manner in which data is to be collected and analyzed there is a good chance that the internal validity and reliability of the data will be quite strong. The field study itself, is far from scientific in nature and any hope of finding results that might stand up to the scrutiny of clinical research is slim. The surveys are seeking generic information about perceptions and opinions and as such are likely to yield data that is valid and that applies to what is genuinely felt. The fact, that teachers represent all level of the school district, different subject areas, are from different schools, and have had very different experiences using the blended learning approach, all speak to the diversity of the informational sources and add to the validity of the information collected.

This would not be the case when looking at the external validity of the field study, where there would be a wide application to other situations. One of the key

limitations of a study that is as localized as this, is that it is unlikely to apply in a broader setting. It is true that some of the questions could be useful in that they give a general understanding of the potential strengths and/or weaknesses of blended learning, and even could speak to the potential reaction of the key constituent groups, but beyond a very tight scope, little of the data is likely to have universal appeal in the field.

Ethical Concerns

Even though the field study uses human subjects, some of whom are students, due the generic design and anonymous nature of the survey data there are few ethical concerns. Being a school district that is close to the University of Kansas, Lawrence Public Schools has an individual on the district staff, who is assigned to assure that no research is completed in the district without the requisite. Dr. Terry McEwen has reviewed all of the developed surveys for the collection of data in this study and has overseen all surveys, both in terms of content and how they were administered.

Dr. McEwen will ensure that our research complies with all ethical criteria, and what types of forms and/or consent must we obtain before conducting our study. Full disclosure of all information will be shared with all participants at all times, and in all data collection tools, information will be given anonymously and on a totally voluntary basis.

Limitations of the Study

Clearly a study of this type has significant limitations, and so should only be used to provide a generalized view of one very small sampling of blended learning. While it is true to say that the data collected will be useful evidence that can be used to determine what might be expected if the experiment was replicated on a greater scale. The results can certainly be used to indicate some of the generic strengths and weaknesses of blended learning in a Midwestern mid-sized school district, but should not really be used in any scientific way.

That being said, there is a significant amount of subset data that will be highly useful for those who are seeking to implement blended learning in the classroom. The collection of data from parent, students, and teachers allow for some triangulation of feedback to occur, which can be used to foreshadow many of the issues that need to be addressed should the district move forward with a more formal adoption of blended learning. Feedback regarding the amount of planning or grading that teachers are expected to complete, the comfort that students have with the independent nature of their new learning process, and whether or not access concerns are valid or can be overcome, are just some of the many questions that can be answered even in this somewhat informal field study.

Provided that researchers understand the limitations of the field test, the information can become genuinely useful in painting a picture of what the future might hold in terms of blended learning in the district.

CHAPTER FOUR

Findings

Methodology

In order to ensure the data collected was truly useful, all participants voluntarily contributed to all surveys, and at no time was it possible to determine which students, teachers, or administrators did or did not answer the surveys sent out. All surveys were distributed through an external link, therefore allowing participants to freely answer without the need for them to self-identify in any way. While some of the questions allowed the researchers to determine a little demographic information about the respondents, no questions were mandatory for the survey to be completed and participants were encouraged to answer only what they felt comfortable with.

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The surveys were designed in order to collect generic data in an attempt to look for patterns or a consensus of feedback from those who were a part of the experiment. It was important for the surveys not to lead the participants in any way – and for the feedback collection to be established with an understanding that all data is welcome, regardless of whether it was about what was working or what was not! In order for the data to have genuine validity, it was imperative the questions speak to the collection of evidence that give a broad picture of the field study rather than look to answer any specific questions at this time. Clearly, at a later stage, there might be a need for more detailed data to be collected, but in order for the study to have a practical application, it must first demonstrate the major elements that do and do not work well, specifically for this school district.

Evidence

It is important to note that at the time of preparing this report while the initial data has been collected, the field test has not concluded and so more information remains to be collected. Results shared to date therefore, reflect the first five months of the study rather than the complete six month field study. Nevertheless, the feedback has been powerful in terms of indicating general trends towards the experience of blended learning.

Perhaps the most powerful feedback received to date speaks to the engagement levels of the students in the blended learning classroom.

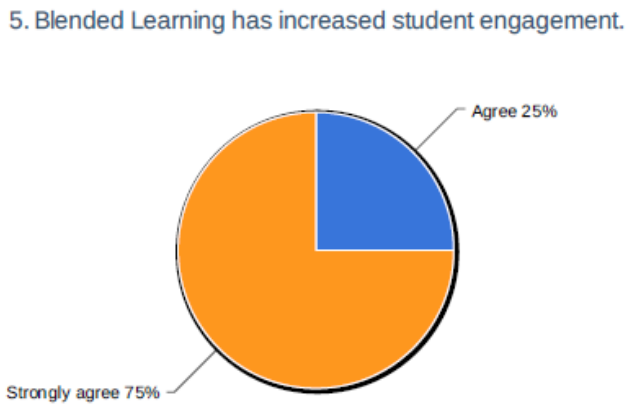

Figure 1

Both the student and teacher survey feedback showed there to be a significant and tangible improvement in the engagement of the students in the field study classrooms. Figure 1 shows that the teachers within the survey were unanimous in their feedback that students were more engaged in their learning when in a blended classroom. Indeed, it should be noted that no other question asked of the teachers elicited the same overwhelmingly positive feedback. These results were mirrored by the student responses, where more than 88% of students responded positively to the statement "I really enjoy the environment of my Blended Learning classroom." In addition to their own positive feelings about learning in a blended environment, students also believed their peers were more engaged in the learning process (Figure 2).

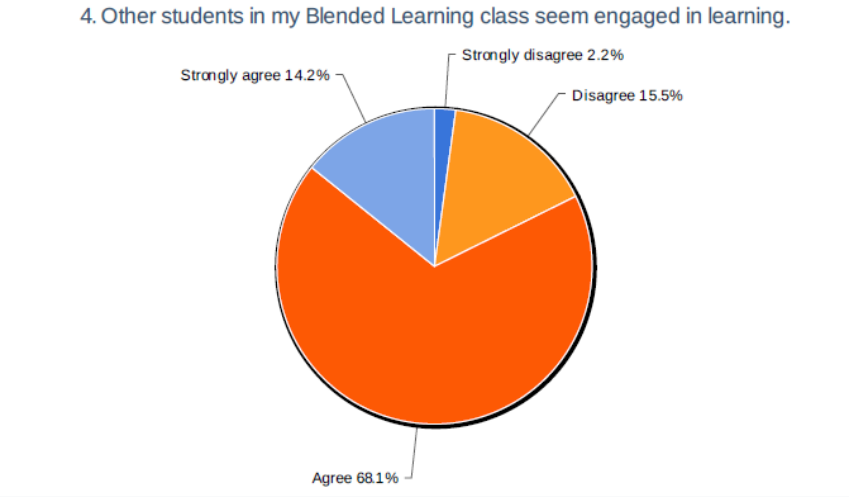

Figure 2

The student feedback did not end here however, in terms of the perceived positive impact on students. When asked, students clearly indicated that blended learning was a learning model that was both appealing to them and a good match for the way in which they liked to learn (Figure 3). More than 75% of those who answered the survey indicated that they either agreed or strongly agreed with this statement.

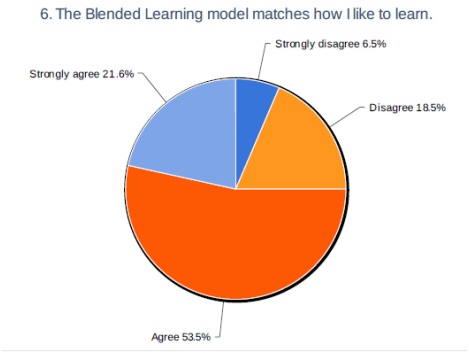

Figure 3

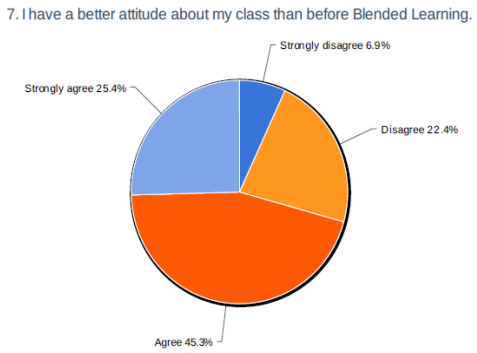

Figure 4

The same students also indicated that learning in a blended classroom had a positive impact upon their attitude to the class. When directly asked whether they had a better attitude about the class in direct comparison to the same class before blended learning, more than 70% answered in a positive way. Such a pattern suggests that in the case of this particular field study, the use of integrated technologies into the classroom using a blended approach is likely to have a significantly positive impact upon student engagement and attitudes. It should be noted however, that in each case, up to 6% of students did not have a favorable experience in the blended classroom, and even indicated disagreement with the statements in the strongest terms. Any widespread adoption of a model of blended learning must come with the understanding that there will be a small, but important group of students who are likely to feel a significant sense of disappointment.

Student preparedness for learning was also regarded to be significantly different throughout the field study. Teachers were confident that students took the time to arrive in class more prepared than when in a traditional classroom. Across the district 75% of teachers indicated they believed students were more prepared when in class (Figure 5), and this was echoed by the students, where more than 80% answered that they felt more prepared upon entering the classroom (Figure 6).

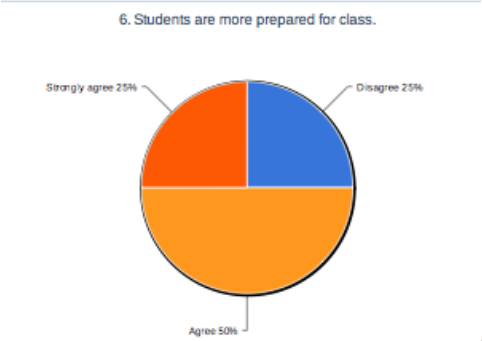

Figure 5

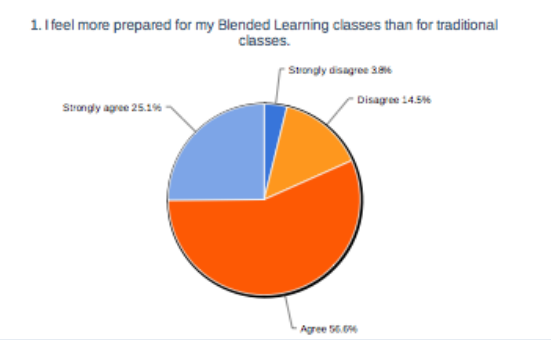

Figure 6

Interestingly these positive numbers were not evident when parents were asked the same question. In fact, while only 15% of parents perceived that their students spent more time preparing for class, 40% of parents did not agree with such a statement. A majority of parents did indicate their son/daughter did their homework in a different way, but they did not confirm that more work was being done out of class, nor that these differences were necessarily positive in nature.

This is interesting data and on the surface very positive, but certainly more work needs to be completed in order to understand which students did not feel that they were better prepared. The question remains whether or not this can be linked to a need for a more structured learning environment, or even the lack of access to the material outside of class. Before drawing any concrete conclusions regarding how well students engage and prepare outside of the classroom, these additional questions must be explored further.

The survey data indicated mixed results when specifically looking at whether or not the change in approach has been positive for communication. Both parents and teachers did not necessarily feel the communication had improved. The parent survey indicated that they did not necessarily feel the teachers had been specifically communicative regarding the project (Figure 7).

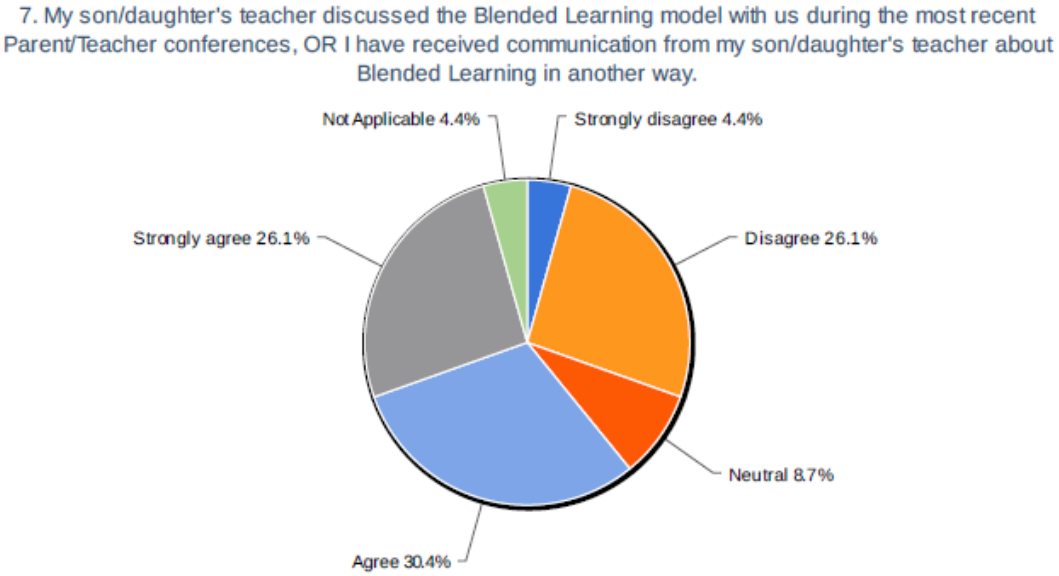

Figure 7

At the same time the teacher survey indicated that the vast majority did not feel communication had increased in any way, with only 25% reacting positively when asked. This was not the case however, when teachers and students responded to questions regarding communication. In this case, the data collected indicated that both teachers and their students felt communication had improved. More than 70% of students responded positively when asked whether or not they communicated

more frequently in a blended model (Figure 8), and the teachers agreed where 75% indicated that they felt communication had been both more frequent and more specific (Figure 9). This is critical data, especially in the area of parent connection – something that must be worked upon in order to integrate a blended approach seamlessly.

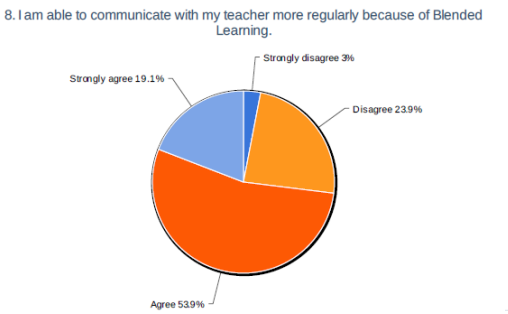

Figure 8

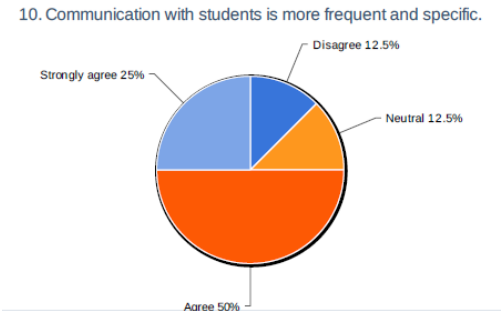

Figure 9

Teachers also indicated strongly that the use of a blended approach helped in the speed at which they gave feedback to students regarding their work. All of the teachers surveyed agreed or strongly agreed when given the statement "I am able to provide more immediate feedback to students". Similarly, 80% of the students who were asked whether or not they were receiving feedback more quickly from their teacher agreed that this was the case. Naturally, this is likely to be the case when digital technologies are being used and feedback to assignments or assessment taken online can be received immediately, but it is interesting that with a different format of learning, teachers appear to feel that time has been freed to give more

individual attention to students, and that this flexibility of time translates into students receiving feedback in a more timely manner. It should also be noted, students, even when using digital resources still associate the immediate access to their feedback with the teacher of the class, therefore also improving their impression of the class as a whole.

Not surprisingly, another of the key factors the data indicates is that the classroom experience is significantly different for all concerned in the project. The most apparent "shift" in instructional style is the amount of, and attitude towards collaboration within the learning process. Interestingly, of all the feedback received from those involved in the field study, the change in perspective towards collaboration has been one of the most positively reported and certainly one of the most universally welcomed development of all. Of all the survey questions asked of students, the discussion regarding the ability for them to collaborate and learn with and from other students, generated the strongest of all positive reactions. Indeed, 88% of all students polled agreed that blended learning allows for more collaboration in the learning process (Figure 10).

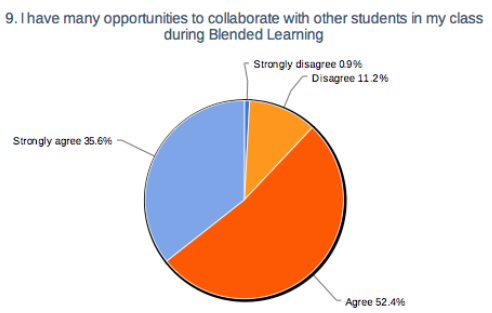

Figure 10

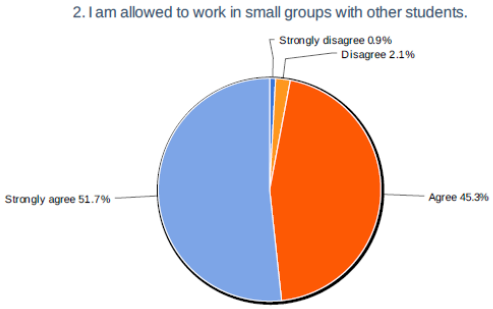

Figure 11

Equally compelling is the data collected from the teachers regarding the collaboration between students. Again, the emphatic nature of the answers speaks to the universality of the collaboration. It should be remembered, given the fact that all teachers responded positively, it did not matter whether or not the students are in Kindergarten or high school the results were the same. At every level, and at all grade levels surveyed there appears to be an increase in collaboration within the learning process.

This is not the only noted change in classroom interactions, especially on the part of the teacher in the room. Teachers reported that the use of blended learning allowed them to spend less time involved in direct instruction (Figure 12), presumably due to the fact, students were able to use technologies and classroom collaboration as tools to supplement and replace what was a traditional 'teacher-led' learning experience. Teachers also indicated, this change in role in the classroom allowed them to have more time to work with individual students during class time.

Anecdotally, teachers also reported that the distribution of the time spent with students also changed, with those students who require more direct 'one-on-one' instruction were serviced in the classroom while those who felt comfortable moving forward on their own, were also able to do so.

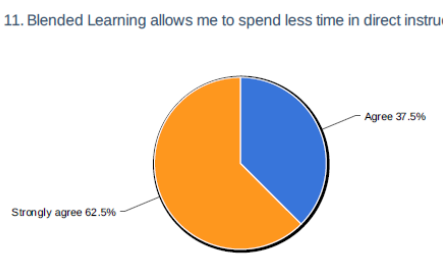

Figure 12

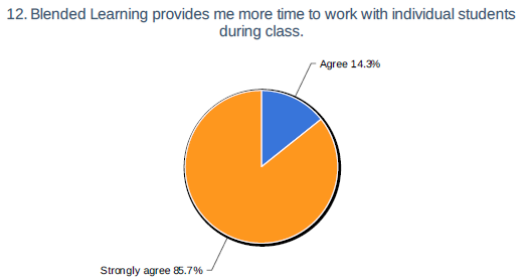

Figure 13

This ability to learn at their own pace, and in the way they feel most comfortable with was another data point for students. When directly asked whether or not the blended model allowed them to work at their own pace, close to 90% of students expressed that this was true. It is not surprising, therefore that an equal amount of students (88%) also indicated that they enjoy the classroom environment established in a blended learning model.

One of the most critical components of a successful blended learning model surrounds the concept of access. Naturally, data was collected from all constituent groups regarding the use of blended learning outside of the classroom, and more specifically access to the technology and connections required using the system

successfully from home. The access issue was not a problem from a student perspective where the vast majority of students reported that being able to access blended resources at home was working well for them (Figure 14). They also responded positively when asked whether or not they could access “flipped” content easily at home, with 83% of students polled indicating that completing their lectures, videos, and homework was easily accessed at home (Figure 15).

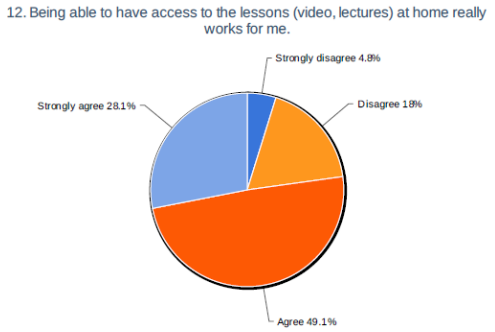

Figure 14

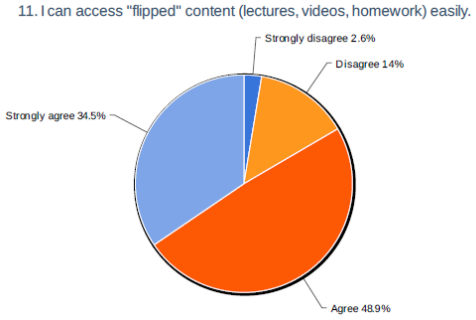

Figure 15

Interestingly, this view was not shared by parents who took the survey. In this case, when asked, 39% of parents reported their son/daughter did not have access to the Canvas software at home. While this was not the majority of respondents, it still represents a significant number of families and if the field study is a microcosm of the broader district community, then it also indicates that large numbers of families might not be able to have home access. Access for the teachers did not raise the same concerns however, with all teachers responding positively when asked whether or not they could access Canvas on all of their devices.

Aside from access, data was also collected about the learning management software itself. As it would be expected, the students indicated by a huge majority that Canvas was easy to use, and something they felt comfortable with. More interestingly, the teachers who took part in the field study, were equally positive about the use of Canvas. More than 85% of teachers reported using the learning management system in a variety of ways including to 'flip' their classroom and in order to work with individual students to meet specific and focused learning targets. It should be noted, these uses were not set objectives within the field study and so data of this sort indicates extremely high levels of intrinsic comfort with the tool being integrated into all elements of the learning process. In perhaps the most powerful feedback regarding the use of Canvas, teachers clearly felt that the experiment was successful enough for them to want to adopt such an approach in classes that were outside of the field study and therefore still being taught in a traditional format (Figure 16).

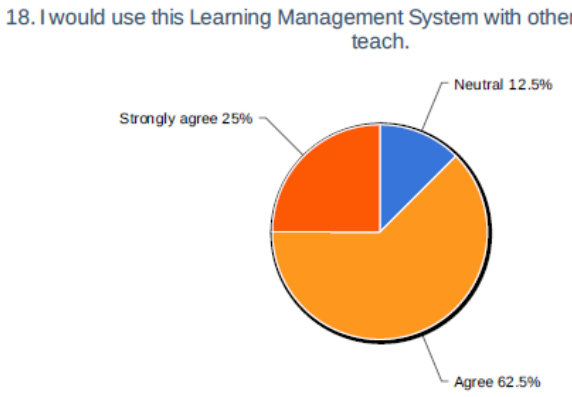

Figure 16

Despite these generally positive results, the ultimate data collection remains one that is closely tied to student achievement. Regardless of all other factors, it is critical that the use of blended learning actually results in an improvement in achievement if it is to stand the test of time. This data clearly cannot be confirmed without the passage of time, but early indicators suggest that while there may be some indications of better grades, these cannot be claimed with any certainty. That being said, the perception of most is that the field study produced some excellent results. Parents were broadly complimentary of the blended learning classes and when asked directly whether or not their child experienced success in the class more than 78% indicated that this was the case (Figure 17). Additionally, more than 65% of the same parents when asked whether or not they saw positive benefits to learning through a blended model agreed (Figure 18). These numbers indicate a significant majority of parents and speak to the general belief from parents that the field study was not only a worthwhile experience, but one that had good potential for the future.

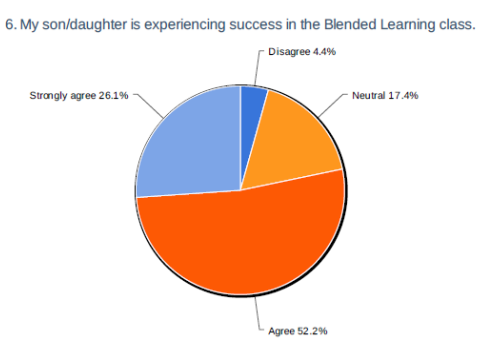

Figure 17

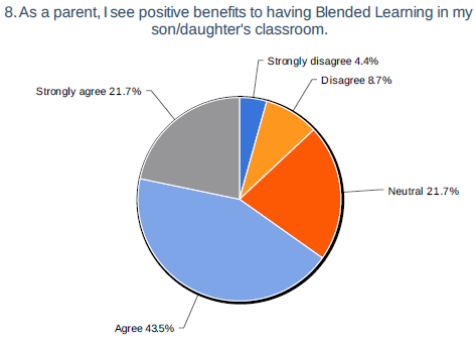

Figure 18

The teacher responses were far more cautious, though did suggest a positive trend. While no teachers indicated a negative reaction to the prompt that student achievement has increased by measured assessment, only 37.5% were comfortable agreeing with the statement (Figure 18). Although this was the case when reflecting upon the students as a whole, teachers were far more positive in the data collected about how blended learning had been a positive influence upon students with disabilities. When questioned about this particular student population 100% of the teachers responded that they agreed that this was the case (Figure 19).

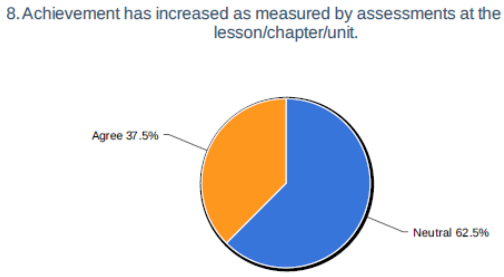

Figure 19

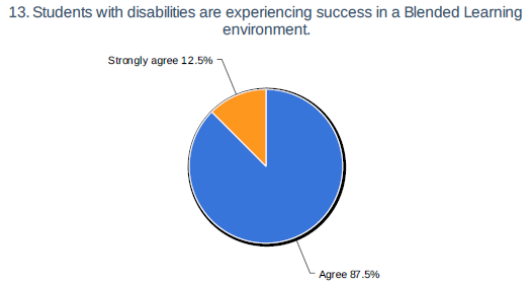

Figure 20

It was also noticeable that when asked 100% of the teachers also felt that a blended classroom was a more equitable approach than the traditional classes that they were also teaching. In discussion, clearly while the overall achievement levels of students may not have definitively improved, within specific demographics there are indications that it does have the potential to improve the performance of some students.

The student feedback was a little more mixed in its response. In each of the questions asked, the majority of students certainly responded positively, but does not negate the fact that 1 in 4 students did not indicate a positive reaction to blended learning. Most students (71%) did believe they had learned more in the class because of blended learning (Figure 20), and similarly most students (72%) also reported, they believed that blended learning had helped them learn more than if they were in a traditional room (Figure 21).

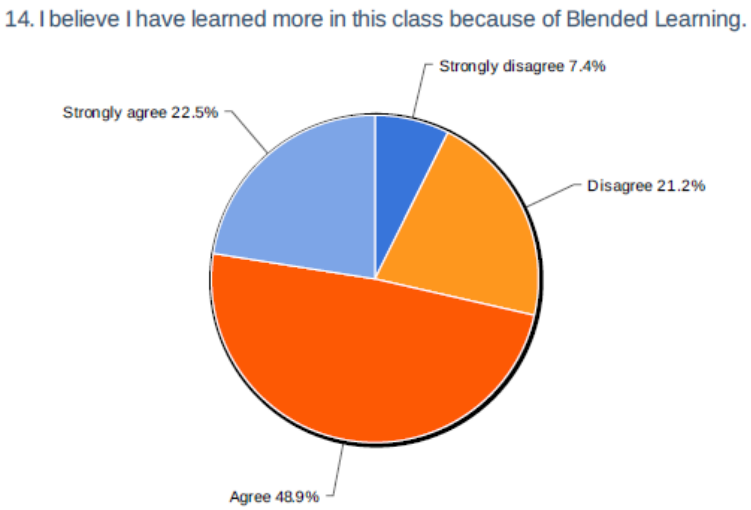

Figure 21

Nevertheless, it must be remembered that more than 20% of students did not feel blended learning was a positive experience for them. In a smaller field study this number might be fairly small, but when expanded over a 10,000 student public school district, this number represents more than 2,000 students. Clearly the model is not for all!

CHAPTER 5

Summary

The concept of blended learning seems to be a little more than just another of the fads education attracts every few years. With the emergence of educational technologies at the rate witnessed over the past few years, there is now a real need to reassess how the process of learning takes place. Regardless of personal comfort levels or educations philosophy most teachers now accept the use of at least some technology in the classroom is a positive thing. This, in a 'de facto' sort of way, introduces blended learning into almost all rooms – even though many of the teachers using the approach would not recognize the fact.

Based upon the early data from the district field study, blended learning can be a powerful tool in the armory of teachers attempting to actively engage all students in the classroom and genuinely differentiate learning. The vast majority of students react positively to a blended model of learning enjoying the fact that they have the ability to learn material at their own pace and using a variety of media. They also are very comfortable with the fact that learning can be accessed beyond the classroom walls, therefore allowing them to learn at the times that suit them and using the technological tools that are such an integral part of their world. It is interesting that the majority of feedback received highlighting concerns with a blended model, derives from students who are more successful in a traditional

format, and who in anecdotal comments admit to the fact that they are challenged and concerned about a change in learning style. It is understandable, upon reflection, that students who have enjoyed significant success in a traditional setting are less likely to be eager to adopt a change as readily as those who might be looking to find a different approach in the classroom. This is removed from what might normally be expected and the most capable students might usually be presumed to be a significant part of the group of early adopters.

The same might be said for the teachers, where, those who have achieved great success in a teacher-led environment appear to be less comfortable with a challenging and different approach to teaching. Certainly the biggest stumbling block to a broad adoption of blended learning will be the paradigm shift required on the part of the teachers. There is an emotional hurdle to overcome, particularly in the role change on the part of the instructor, including the need to facilitate and instruct rather than play a central role in the formal "teaching" aspect of learning. Teachers must enter into blended learning understanding that the amount of planning and preparation will actually increase, but this will, in turn, give more time for teachers to be able to engage with students in the classroom. The end result of this that the needs of students can be met in more depth, and the differentiation becomes a fundamental component of the classroom. This shift does not come easy

though – even those teachers who are the early adopters and highly supportive of blended learning, speak to the difficulty in reframing their classroom practice.

For parents, the concept of blended learning remains a mystery for the most part. So far, removed from their own educational experience, and so closely linked with a level of technology that is not always understood or appreciated, most remain somewhat indifferent to the experiment. While many welcome the excitement and engagement that they witness in their own student, others remain skeptical of a learning style that does not always use a teacher and face-to-face instruction, which has been their only educational experience. The key to bringing parents onboard with such an initiative lies in a careful and detailed education of them, followed by the ultimate factor – that of academic achievement. For those parents that see improved results, the journey to embracing a blended learning environment will be a short one, but without them the journey has a long way to go.

Even though blended learning is not predicated upon the use of technology, it must be recognized that the need for a solid infrastructure and working hardware is critical to successful implementation in the classroom. One of the most significant frustrations of the teachers who have participated in the field study has been, that when the technology is not functioning, the time taken to get it back online is a major distraction to all concerned. Similarly, students have an expectation for devices to work at all times, and the level of patience when it comes to dealing with

non-functioning technology is surprisingly low. It must also be understood, that specific structures be put in place to overcome the concern regarding internet access both at school and home. The equity of the technology access is of key importance in any roll out of blended learning and therefore, the thoughtful planning in advance of the technology required and the infrastructure necessary becomes a must.

As with all educational models, time will tell as to whether or not blended learning is here to stay. More importantly perhaps, much more detailed study is required before definitive answers can be collected. There should be little doubt, in theory, with the right technology, a well-trained and motivated teacher and student who are eager to find a system that meets their individual needs, there is huge potential. In truth, however, whether or not the theoretical model can be turned into a practical reality remains to be seen. The field study suggests that, at least on a small scale this can be done with some significant success, but bringing this about on a much larger scale is another challenge entirely. The next steps for the district must be to replicate the field study on a much larger scale to see if the same levels of positive feedback can be maintained with all constituent groups.

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