Supporting Teachers Implementing Blended Learning

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Budget cuts and the forecasted teaching shortage have school districts turning to blended learning to meet the needs of students with fewer resources. At the same time, the increase in affordable, mobile technology and connectivity has facilitated this shift (Christensen, Horn & Staker, 2013; Horn & Staker, 2011), with 50% of all high school courses expected to be online by 2019 (Christensen, Horn & Staker, 2013). Furthermore, over 3 million K-12 students were taking online classes in 2009, a dramatic increase from the 45,000 in 2000 (Christensen, Horn & Staker, 2013). Stakeholders in education, including government departments and educational technology companies, are quick to emphasize the benefits of blended learning—flexibility, personalization, cost-savings, differentiation of instruction, and teaching college and career readiness skills (iNACOL, 2013; USDOE, 2010). As schools increasingly turn to blended learning and a growing number of students receive instruction in a blended format, it is imperative that school districts provide training and support for teachers. This paper describes the barriers teachers face in implementing blended learning, provides current solutions to these problems, and identifies directions for further research in order to better support teachers moving forward.

Defining Blended Learning

In this ever-changing educational context, the use of the term *blended learning* has been haphazardly applied to any instruction that incorporates technology. This slapdash approach has inadvertently created a high degree of ambiguity and confusion about what the term blended learning actually means. In general terms, a simpler definition of blended learning defines it as "the use of online learning in conjunction with traditional teacher led forms of instruction" (Means, Bakia, & Baker, 2014, p. 100). Friesen (2012) suggests that blended learning "designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students" (p. 1). By emphasizing the relational aspect of blended learning, Friesen touches on the evolving role of teachers—and therefore the critical importance of the time and training required to thoughtfully implement technology in order to truly innovate classroom design and promote deeper learning.

Blended Learning and the Promising Effects on Student Achievement

Hampered by budget cuts, while simultaneously being expected to expand course offerings to meet the demands of the modern workforce, K-12 educational institutions are turning to blended learning for answers. Specifically, blended learning is viewed as a strategy for increasing variety and instructional time, promoting the understanding of complex or abstract concepts, motivating disengaged students (Means et al., 2014), and fostering 21st century skills such as collaboration and technology skills (Kellerer et al., 2014; P21, 2016). It also has the capability of serving students with diverse needs by making learning more accessible and individualized through its differentiated and student centered nature (Kellerer et al., 2014). Students can self-pace through the course material (Werth, Werth, & Kellerer, 2013), allowing those who are struggling to attain the foundational skills needed to catch up to their peers (Means et al., 2014). For students who may excel, they are able to progress through new material without being held back by the rest of the class (Means et al., 2014). Blended learning also has the potential to enhance teacher-student communication, improve student behavioral issues, increase time on task, push students to

work independently of the teacher, intensify student drive to complete assignments and excitement to learn, and positively affect teachers' ability to innovate and enjoy teaching (Werth et al., 2013). In fact, teachers report that blended learning allows them to better monitor student learning and manage their classrooms (Kellerer et al., 2014). Additionally, teachers indicate that blended learning increases their own self-efficacy and confidence (Kellerer et al., 2014). Given the potential for enhanced student learning, schools and school leaders need to understand the obstacles in order to find ways to overcome them and support teachers in implementing blended learning.

Barriers to Implementing Blended Learning

Although teachers recognize the benefits of blended learning, they communicate that there are great barriers to its implementation. Werth et al., (2013) conducted a survey of teachers to identify what teachers perceive as preventing them from successfully implementing blended learning. Teachers reported that time, followed by technology, and then training are the most significant obstacles. In light of this, it is essential to take an in depth look into several causes of these barriers in order to support teachers throughout the implementation process to ensure success of the blended learning program.

Instructor Time

In a profession characterized by ever-increasing demands, many teachers and professors shy away from teaching models perceived as time-intensive. Blended learning, with the time required to learn the technology, prepare course material in advance, and manage the day-to-day course experiences intimidates or discourages teachers from utilizing it (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurer, E., & Sendurer, P., 2012; Gonzalez, 2012; Vatanartiran & Koradeniz, 2015; Wanner & Palmer, 2015). Experienced blended learning teachers echo these concerns, reporting that the first several years of implementing blended learning are time intensive. Teachers must learn and experiment with instructional delivery and technology, while curating resources and managing logistics, a process that takes several years to fully implement (Ertmer et al., 2012; Werth et al., 2013). Blended learning requires time throughout the process of design, construction, and implementation as teachers become acquainted with new instructional strategies, resources, logistics of running the course, and interacting with students.

Blended learning often utilizes delivery systems that teachers need to learn how to operate before beginning instruction in order to best facilitate the course (Gonzalez, 2012). For teachers who are unfamiliar with these platforms, it may take longer to develop confidence and familiarity with how to utilize the technology (Ertmer & Ottenbreit-Leftwich, 2010). Even after teachers understand the technology, they may need to spend time adapting instructional materials to ensure suitability to an online setting (Jeffrey, Milne, & Suddaby, 2014; Kaleta, Skibba, & Joosten, 2007). Teachers then need to spend time in advance of starting a class experimenting with the delivery system and importing instructional materials, which may take varied amounts of time depending on a teacher's comfort and experience with technology.

A potential pitfall for teachers who do not invest the time in advance to conceptualize the course is to utilize the online portion of the course simply to transmit information while maintaining the same in-class structure the teacher is familiar with which overloads students and misuses the blended format (Kaleta et al., 2007). Instructionally, the blended learning environment is pedagogically different from a face-to-face classroom or a fully online setting. A well-structured course that thoughtfully integrates the online portion with in-class activities is important to the success of

blended learning, and these components must be conceptualized before the course begins (Jeffrey et al., 2014). In addition, when restructuring a course for blended learning, teachers need to consider how to incentivize students to engage them meaningfully online, which is necessary for the success of in-class activities, requiring pre-planning time to consider how the incentives fit in the course expectations and assessments (Gebra, Saroyan, & Bracewell, 2014; Kim et al., 2014). When planning for an online format, teachers must restructure assessments to allow online administration and consider alternative forms of assessment enabled by the blended format, requiring teachers to spend additional time reconsidering and restructuring assessments before implementation (Kaleta et al., 2007). Teachers must then design content and course structures in advance of the course beginning for both contexts, in-class and online, requiring more time than simply designing for one format (Jeffrey et al., 2014).

Even with careful planning ahead, teachers find that once the course begins they are continually designing and redesigning instruction, learning activities, and resources for students as the course progresses (Powell, Rabbit, & Kennedy, 2014). Since technology and information continues to evolve rapidly, teachers must constantly seek out new tools, educational sites, and supplemental materials to meet student needs and enhance instruction (DiPietro, Ferdig, Black, & Preston, 2010; Vatarnartiran & Koradeniz, 2015). If there are no pre-existing materials, teachers may choose to video record lectures to post online for students to view in advance of classroom activities, similar to a flipped classroom, requiring teachers to take planning time when students are not present to make these videos and post them (Kim, M., Kim, S., Khera, & Getman, 2014). Teachers also need to invest additional planning time constructing new discussion questions that will promote thoughtful student participation since students will be engaging in the discussion without the teacher present to rephrase questions or probe based on student responses (Gonzalez, 2012; Kaleta et al., 2007). The ongoing reflection and research required to structure blended learning and meaningful online activities demands a significant time commitment, often falling outside of the school day.

Differentiated instruction and self-pacing are documented advantages of blended learning because learners have different levels of maturity and understanding, but preparing for a variety of student paths and paces requires more time. Teachers must spend time to find or construct different supports from basic tutorials to more interactive instruction (Meier, 2016). Furthermore, teachers must assess individual student abilities and growth areas to inform learning activities that address the needs of all learners (Powell et al., 2014). This requires teachers to spend time reading student online work submissions and then making decisions about what to reteach, what supports to add, or what students are ready to move forward (DiPietro, et. al., 2010; TCDSB 21, 2015). While many teachers have been differentiating instruction, those who create online materials for the first time may feel like converting to an online format and creating individual instructional plans is an increased demand on their time as they have to find tools to present the information in different ways and not remain static with the material as students' needs change and differ (DiPietro, et al, 2010).

Throughout the semester or year of the course, teachers manage and monitor the online student interactions and activities. Teachers must spend time designing and delivering direct instruction on how to appropriately interact online to help students benefit from blended learning (DiPietro et al., 2010; Gonzalez, 2012; Ryle & Cumming, 2007). Once the course has begun, students working asynchronously at home with online material may have questions outside of school hours and expect teachers to

respond in a timely fashion in order for students to complete the work (Hawkins, Graham, & Barbour, 2012; Kaleta et al., 2007). Besides responding to student questions, teachers also need to log-in to the online platform regularly so that they can provide meaningful feedback to online submissions to facilitate progress (Hawkins et al., 2012; Jeffrey et al., 2014; Jeffrey, Milne, Suddaby, & Higgins, 2009). Additionally, teachers are expected to reach out to disengaged students and, in a K-12 setting, their parents, involving phone, email, or conference time (Jeffrey et al., 2009). Experienced blended learning teachers report that they feel the need to be constantly available to respond and that it can be time-consuming to reply to numerous emails in and out of work hours (DiPietro et al., 2010; Gonzalez, 2012).

For teachers new to online discussions, learning how to facilitate these student exchanges takes time to learn. Experienced teachers report the importance of knowing when to get involved in online student discussions, when to refrain from commenting, when to insert encouragement, and when to stop a particular line of discussion that is not meeting course objectives (Ryle & Cumming, 2007). Teachers report feeling that the quantity of discussion board posts to be read is too much (Kaleta et al., 2007). Owens (2012) found that the task teachers were least likely to perform was facilitating student interactions online by monitoring and contributing to the student discussions. Ultimately, blended learning teachers are working with students during school hours in class and then online out of school hours, adding time constraints to the already stretched schedules of educators.

Despite the aforementioned time constraints, experienced blended learning teachers mitigate the time spent monitoring student online activity by scheduling a specific window of time to review and comment rather than logging in constantly (Kaleta et al., 2007). Teachers also report that the time spent responding to student posts decreases as the course progresses because students and teachers become more confident and comfortable with the course's structure and expectations and teachers can be less involved in online discussions (Ryle & Cummings, 2007). To continue to persuade more teachers to embrace blended learning and improve the transition experience, additional research into how to allay concerns and address the increased time investment is needed.

Technology

Technophobia and resistance to change. Technological advances increasingly pressure the field of education to embrace significant change. Blended learning is a hybrid solution that merges new technological innovation with the longstanding relational elements offered by brick-and-mortar schools (Christensen et al., 2013). In creating such a solution, the education field is attempting to sustain its traditional concept of schools as a space that provides face-to-face instruction. Failure to transform any aspects of operation within this traditional model can be crippling since new entrants almost always replace the traditional one over the long term (Christensen et al., 2013). Applying this to the multitude of new entrants that have entered the educational landscape, teachers and educational leaders must realize the import of proactively and responsively participating in the evolution of the classroom.

The uncertainties associated with change, such as a raised risk of failure, reinforce the comfort of doing business as usual and increases resistance from teachers (Johnson et al., 2013). Technological innovations can also be perceived as threatening, which may cause educators to become defensive and fear revealing any shortcomings that may reflect on them personally. Therefore, criticism of more traditional educational settings must be carefully framed so that educators understand that

longstanding practices used in the field represented the most effective options in a world that lacked technology. Finally, providing hands-on experience with various tools and applications can support teachers to overcome their fears and resistance (Vaughan, 2007).

To counter resistance from individual teachers, school leaders must also effectively use strategies to promote a culture of learning and improvement. Cultivating and developing what Carol Dweck termed "growth mindset" (Dweck, 2006), which includes those who "enjoy challenging themselves to take on the next new idea," (Farrington, 2013, p. 6) will be a continual task of school leaders. Similarly, to transition to blended learning, teachers must view learning and implementing new technologies as part of their job expectations. School leaders should identify those teachers who are most enthusiastic to serve as early adopters to pilot the use of new technological tools, work through any shortcomings, and then serve as coaches to help promote and support broader adoption. These people can be relied on to engage in informal learning for the betterment of their own practice and to advance student success.

Public K-12 institutions in the United States are also plagued by deep relationships with textbook companies, political affiliations, and unions, which can hinder the adoption of innovative teaching practices like blended learning (Horn & Staker, 2011). Consequently, those whose roles are affiliated with the incumbent players may turn to defensive tactics such as legislation to postpone or thwart changes. In turn, some of the most entrenched stakeholders shelter school systems from innovation through funding restrictions and policies that inhibit local flexibility to protect their vested interests (Christensen et al., 2013, p. 36). Charter schools and for-profit institutions are new entrants that take advantage of these systemic slowdowns and are increasingly positioning themselves to fill the gaps of the existing educational system. Because many of these schools are not bound by the same regulations, they bring about an appealing promise to achieve higher levels of success. These promises in turn attract students, parents, entrepreneurs, and philanthropists alike who aspire for innovation and seek to address delays in the pace of change, albeit outside of the traditional public school model. Despite institutional resistance, public education must adapt to the evolving needs of the 21st century workforce and global economy by embracing a renewed mindset.

Fully integrative and customizable learning management systems. While promising, the saturation of technology solutions on the market reflects growing complexity that creates challenges. In K-12 school systems, the abundance of software options has not been built in a way that allows different products to easily integrate or work together (Horn & Staker, 2011). This is in part because educational technology companies are typically limited in scope as they try to make a niche for their products by excelling in one area of learning. For instance, they might develop a curriculum, grade book, interactive lab, or an educational game. However, bringing together these varied components in one system is often difficult for schools because many products lack integration capabilities or require significant and costly development to achieve this goal. The consequences of software working independently are enormous and ultimately reduce the potential of what can be achieved. Consider a teacher trying to gamify a lesson, but they cannot embed the technology into the school's learning management system (LMS); or a school that uses an online grade book that does not match the built-in assessment of a curriculum. These threaten the widespread adoption of otherwise promising tech solutions because they lead to frustration, inefficiencies, and lowered morale. As technology evolves, market options continue to expand. The rise of

application program interfaces (APIs) and plug-ins are enabling customization at more affordable costs and thereby advancing integration of disparate systems. "The hope in the field is that adoption of interoperability standards...will one day make it easier for schools to integrate data from multiple online learning programs with their learning management systems" (Means et al., 2014, p. 118). With this progression, it is critical for schools and districts to be equipped with the technical expertise to choose software carefully and with the full picture in mind.

Equity in digital access has yet to be achieved creating challenges for schools to implement and benefit from blended learning. The way technology is integrated and used varies from district to district, school to school, and classroom to classroom. Within schools and the homes of students, there are vast differences between the availability of equipment and support, providing obstacles to classroom teachers. Moreover, accessibility to technology has grown more nuanced to involve bandwidth capabilities, availability of software, among other factors (Dolan, 2015). For teachers to incorporate technology into their lesson design, they need to navigate the accessibility to and availability of appropriate technology for each student while coordinating with technology support staff in order to make use of what is available within the school. Ultimately, teachers in school systems with inadequate funding and technology staff will face severe limitations to implementing blended learning.

Training

The evolution of the teacher's role when placed in the blended learning environment creates a demand for training that will address the need for pedagogical shifts and the closing of technological training gaps. Teachers specify lack of training as one of the three major barriers to implementing blended learning (Tshabalala, Ndeya-Ndereya, & Van der Merwe, 2014; Werth et al., 2013). Professional development must be provided to teachers to support their learning of how to develop blended instruction and facilitate student learning more efficiently and confidently. It must identify and include pedagogical strategies that are specific to blended learning and that addresses the need for a paradigm shift in how teachers perceive their role (Werth et al., 2013). Professional development can also aid in dispelling prohibitive perceptions surrounding the implementation of blended learning such as fear of failure or fear of technology (Tshabalala et al., 2014). Conversely, because "individuals who use IT must regularly evaluate their skills and determine which new skills they need" (Ezziane, 2007, p. 179), trainings must be differentiated based on varying levels of teachers' technical expertise. While professional development also requires teacher time, including releases from class or attendance at summer trainings, it promises to provide teachers with tools and knowledge to better instruct in a blended format that may reduce overall time spent on creating online activities.

Professional development must focus on teacher effectiveness across a spectrum of characteristics necessary for teachers to succeed in the blended learning environment. Powell et al. (2014) address the new role of teachers and the demands of new and evolving pedagogies. They propose a teacher competency framework which is not a rigidly defined set of guidelines, but rather a starting point from which to develop the teacher. The framework is organized into four main domains: mindsets, qualities, adaptive skills, and technical skills (Powell et al.) that highlight the proficiencies needed in this ever changing and dynamic system of blended teaching and learning.

Training that develops *mindsets* for blended learning must focus on teachers shifting from teacher centric to student centered learning models, valuing collaboration, flexibility,

growth mindsets, innovation, embracing change, and encouraging self direction (Powell et al., 2014). Professional development should help to foster *qualities* like perseverance and the ability to demonstrate persistence to others, being open and transparent while remaining objective, and a willingness to work, learn from, and share expertise with others (Powell et al., 2014). The *adaptive skills* that need to be addressed in training are reflective practices aimed at what does and does not work, pursuing feedback in order to improve practices, continually improving practices through problem solving and innovation, and communication (Powell et al., 2014). *Technical skills* relate to the management of data to assess student progress and to evaluate the effectiveness of online instructional tools, the instructional strategies and resources used, assessments, managing the blended learning classroom to provide students opportunities to work asynchronously and synchronously in multiple modalities, modeling appropriate and effective online behavior, troubleshooting, and learning how to appropriately use the learning management system and other online tools to facilitate learning (Powell et al., 2014). Teachers must be shown how to use the tools that their schools adopt so as to extend the learning of their students and aid them in modifying their own practice. Without this, teachers will revert to implementing their old design in a different format. In fact, many "new investments are underutilized, not used at all, or used in a way that mimics an old process" (Johnson et al., 2013 p. 9). In addition to teacher training, another consideration might be training for administrators so that they can better understand the barriers of implementing blended learning and provide support to teachers throughout the process.

Conclusion

Blended learning has the potential to meet the needs of diverse learners throughout K-12 and higher education institutions. Teachers recognize the immense benefits of blended learning, but time, technology, and training still prove to be barriers to successful implementation. Educational institutions can help to alleviate teacher time by creating efficiencies that make it easier to learn and manage the technology, create or modify content, and facilitate student-teacher interactions. Teachers must be provided with ongoing professional development that reflects the mindsets, qualities, adaptive skills, and technical skills that are necessary. It is essential that professional development emphasize the need for continuous improvement as the ever-changing technological landscape evolves.

Although the literature on blended learning provides insight regarding the causes of these barriers, it offers little in the way of how to proactively address time, technology, and training issues in a unified and systematic manner. Given that many districts are financially strained and the inherent costs associated with implementing training and technology, educational stakeholders must open their minds to even the most drastic changes. Perhaps, for instance, a hybrid solution for struggling school districts might involve a three- or four-day face-to-face environment that transitions the remaining school time online—a move that arguably sustains brick and mortar schools while reducing costs and ensuring teachers have more built-in time to manage blended learning. Further exploration is needed to better understand the effectiveness of more significant shifts in school design. Moreover, research also needs to be done regarding how to streamline the implementation process from the start so that teachers feel prepared to handle the shift in pedagogy and skills needed as well as feel supported throughout the process. However, now that we have a base of research that points to these barriers, school districts and higher education institutions can focus on making efficient use of the teacher time necessary for implementation, building adequate technological infrastructure to support blended

learning, and providing ongoing training and support to teachers throughout implementation to ensure the success of blended learning programs.

References

Betts, K. & Heaston, A. (2014). Build it but will they teach?: Strategies for increasing faculty participation & retention in online & blended education. *Online Journal of Distance Learning Administration, 17*. Retrieved from

http://www.westga.edu/~distance/ojdla/summer172/betts_heaston172.html

Christensen, C., Horn, M., & Staker, H. (2013). Is k-12 blended learning disruptive? An introduction to the theory of hybrids. Clayton Christensen Institute for Disruptive Innovation. Retrieved from http://www.christenseninstitute.org/wp-content/uploads/2014/06/Is-K-12-blended-learning-disruptive.pdf

DiPietro, M., Ferdig, R., Black, G., & Preston, M. (2010). Best practices in teaching K-12 online: Lessons learned from Michigan virtual school teachers. *Journal of Interactive Online Learning, 9*(3), 10-35.

Dolan, J. E. (2015). Splicing the divide: A review of research on the evolving digital divide among K-12 students. *Journal of Research on Technology in Education, 0*(0), 1-22.

Dweck, C. (2006). *Mindset: The new psychology of success.* New York: Random House.

Ertrmer, P. & Ottenbreit-Leftwich, A. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42,* 255-284.

Ertmer, P., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59,* 423-435.

Ezziane, Z. (2007). Information technology literacy: Implications on teaching and learning. *Educational Technology & Society, 10(3)*, 175-191.

Farrington, C. A. (2013). Academic mindsets as a critical component of deeper learning. *University of Chicago: Consortium on Chicago School Research*. Retrieved from http://www.howyouthlearn.org/pdf/White_Paper_Academic_Mindsets_as_a_Critical_Component_of_Deeper_Learning_Camille_Farrington_April_20_2013.pdf

Friesen, N. (2012). Report: Defining blended learning. Retrieved from http://learningspaces.org/papers/Defining_Blended_Learning_NF.pdf

Gebre, E., Saroyan, A., & Bracewell, R. (2014). Students' engagement in technology rich classrooms and its relationship to professors' conceptions of effective teaching. *British Journal of Educational Technology, 45(1),* 83-96. doi:10.1111/bjet.12001

Gonzalez, C. (2012). The relationship between approaches to teaching, approaches to e-teaching and perceptions of the teaching situation in relation to e-learning among higher education teachers. *Instructional Science, 40,* 975-998.

Hawkins, A., Graham, C., & Barbour, M. (2012). "Everybody is their own island": Teacher disconnection in a virtual school. *International review of research in open distributed learning, 13.* Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/967/2143

Horn, M. & Staker, H. (2011). The rise of k-12 blended learning. Innosight Institute. Retrieved from http://www.innosightinstitute.org/innosight/wp-content/uploads/2011/01/The-Rise-of-Blended-Learning.pdf

International Association for K-12 Online Learning [iNACOL]. (October 2013). Fast Facts About Online Learning. Retrieved from http://www.inacol.org/wp-content/uploads/2015/02/fun-facts about-online-learning.pdf

Jeffrey, L., M., Milne, J., & Suddaby, G. (2014). Blended learning: How teachers balance the blend of online and classroom components. *Journal of Information Technology Education,13,* 121-140.

Jeffrey, L. M., Milne, J., Suddaby, G., & Higgins, A. (2009). *Strategies for engaging learners in a blended environment.* Wellington: Ako Aotearoa.

Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2013). NMC Horizon report: 2013 K–12 edition.

Kaleta, R., Skibba, K., & Joosten, T. Discovering, designing and delivering hybrid courses (pp. 111-143). In Picciano, A. & Dzjuban, C. Eds. (2007). *Blended learning research perspectives.* Needham, MA: Sloan Consortium.

Kellerer, P., Kellerer, E., Werth, E., Werth, L., Montgomery, D., Clyde, R., Creach, L., Hibbard, L., LaFrance, J., rupp, N., Walker, N., Carter, T., & Kennedy, K. (2014). *Transforming K-12 Rural Education through Blended Learning:Teacher Perspectives*. International Association for K-12 Online Learning. Retrieved from http://eric.ed.gov/?q=how+to+support+teachers+implementing+blended+learning&id=ED561327

Kim, M., Kim, S., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *Internet and Higher Education, 22,* 37-50.

Means, B., Bakia, M., & Murphy, R. (2014). *Learning online: What research tells us about whether, when and how*. Routledge.

Meier, D. (2016). Situational leadership theory as a foundation for a blended learning framework. *Journal of Education and Practice, 7,* 25-30.

Owens, T. (2012). Hitting the nail on the head: The importance of specific staff development for effective blended learning. *Innovations in Education & Teaching International, 49,* 389-400.

P21. (2016). *Framework for 21st century learning.* Washington, D.C.: Partnership for 21st Century Learning. Retrieved from http://www.p21.org/our-work/p21-framework

Powell, A., Rabbitt, B., & Kennedy, K. (2014). *iNACOL Blended Learning Teacher Competency Framework*. International Association for K-12 Online Learning. Retrieved from http://eric.ed.gov/?q=how+to+support+teachers+implementing+blended+learning&id=ED561318

Ryle, A. & Cumming, K. (2007). Reflections on engagement in online learning communities. *International Journal of Pedagogies and Learning 3*(3)*,* 35-46.

TCDSB 21C (2015, Feb. 18). *What blended learning looks like in the classroom.* [Video file]. Retrieved from

https://www.youtube.com/watch?v=NPvreKWaKjY

Tshabalala, M., Ndeya-Ndereya, C., & van der Merwe, T. (2014). Implementing Blended Learning at a Developing University: Obstacles in the Way. *Electronic Journal of e-Learning*, *12*(1), 101-110.

U.S. Department of Education [USDOE] (2010). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies. Retrieved from https://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdfhttps://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf

Vaughan, N. (2007). Perspectives on blended learning in higher education. *International Journal on E-Learning, 6*(1), 81-94.

Vatanartiran, S. & Karadeniz, S. (2015). A needs analysis for technology integration plan: Challenges and needs of teachers. *Contemporary Educational Technology, 6,* 206-220.

Wanner, T. & Palmer, E. (2015). Personalising learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Computers & Education, 88,* 354-369.

Werth, E., Werth, L., & Kellerer, E. (2013). *Transforming K-12 Rural Education through Blended Learning: Barriers and Promising Practices*. International Association for K-12 Online Learning. Retrieved from http://eric.ed.gov/?id=ED561276