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# Exploring Teacher Perceptions of Blended Learning

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# Walden University

COLLEGE OF EDUCATION

This is to certify that the doctoral study by

Jill Sorbie

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2015

Abstract

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Although research supports the blended learning methodology as a way to personalize and engage students, research also documents the widespread hesitation among educators when it comes to embracing technology.  District leaders believe that such is the case in an upper Midwest school district where all high school students are provided devices, yet these leaders note that few teachers are fully exploiting the tools. Framed by the connectivism and social constructivism theories, this qualitative case study focused on teachers' views of blended learning, its influence on their teaching practices, and how they see it helping students to learn.  The guiding research questions addressed the successes and challenges of blended learning, including how Moodle was used for formative e-assessment. Data were collected from 12 purposefully selected high school teachers by a questionnaire, 3 different observations in each of their classrooms, computer screenshots provided by participants, and 3 semi-structured interviews per teacher.  Open coding produced common themes during the data analysis.  Findings show that these teachers believe that blended learning promotes individualization, collaboration, organization, engagement, real-world relevance, and student-centered learning.  While they agreed that blended learning supported their practice, challenges were cited such as students disengaging in the learning process, device and infrastructure concerns, and the time to integrate technology effectively. Based upon these findings, professional learning communities were designed to improve teacher pedagogy for using blended learning.  This study may serve as a model for staff from other schools who are integrating higher levels of technologies as they try to level the playing field and prepare students to be global citizens with the necessary 21$^{st}$ century skills.

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Dedication

This doctoral study is dedicated to my husband, Mark.  Your love, understanding, and encouragement has been unwavering.  Your words of support throughout this entire journey have meant more to me than I can express.  I will forever be in your debt.

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Section 1: The Problem

**Introduction**

Some students in a district in the upper Midwest states may be slighted in that

their teachers do not adapt quickly to the new instructional approach involving the

integration of technology (D.R., personal communication, December 27, 2014; D.Z.,

personal communication, December 19, 2014; T.C., personal communication, January 11,

2015 & March 4, 2015). The goals listed by district staff are to personalize education,

prepare students for the future, and offer an educational program where students can

perform in an ever-changing global society highlight the importance of technology

(Minnesota School District, 2012). Furthermore, the district leaders' goals are to

personalize and enhance the learning experiences, increase student engagement along

with students' 21$^{st}$ century skills, and use data to inform decisions (Minnesota School

District, 2012). To accomplish this vision, the district leadership adjusted the district's

instructional approach from teacher centered to student-centered blended learning by

providing all students with iPads allowing for an equitable learning experience for all. In

addition, staff uses a learning management system (LMS) to manage and deliver

educational material. Throughout the implementation of the one-to-one devices and the

use of the LMS, instructional staff have been provided ongoing professional development

(PD) (T.C., personal communication, March 4, 2015). However, some high school

students may not be receiving a personalized educational experience or increased 21$^{st}$

century skills because some teachers may not be using or may be underusing the

technologies and the LMS (D.R., personal communication, December 27, 2014; D.Z.,
personal communication, December 19, 2014; T.C., personal communication, January 11,
2015).

The purpose of this qualitative project study was to explore how teachers who use
blended learning perceive that it influences their teaching practices and assists students in
the learning process.  As a part of this research purpose, I explored teachers' perceptions
about the successes and challenges of blended learning, including how Moodle was used
as a tool for formative e-assessment.  Moodle is one type of LMS that allows teachers to
upload lessons, quizzes, and assignments.  The results of this study identify the specific
components of Moodle and various technology tools that assist teachers in addressing
student learning outcomes.

Researchers have indicated that blended learning environments can enhance
student learning and improve teacher pedagogy (Delialioglu, 2012; Wang 2011). Since
the federal government's No Child Left Behind ([NCLB], 2001) Act, there have been
numerous initiatives that mirror the challenge for teachers to provide meaningful learning
for all students (Darling-Hammond, Wilhoit, & Pittenger, 2014).  However, the time
commitment and understanding of ever-advancing technologies can be exhausting for the
teacher (Gedik, Kiraz, & Ozden, 2012).  In addition, the site state enacted the Education
Act of 2013 also known as the World's Best Workforce initiative, which is said to ensure
that every district addresses the racial and economic achievement gaps between students,
that students are ready for college and careers, and that all students graduate from high
school (Minnesota Department of Education, 2014d). Researchers have emphasized that

students need deeper learning that fosters critical thinking, problem solving, collaboration, communication, use of technology, and an aptitude to be life-long learners (Darling-Hammond et al., 2014). With the emerging paradigm of blended learning, K to 12 institutions are responding by providing access to technologies and the tools needed for authentic learning (Christensen, Horn, & Staker, 2013; Pahomov, 2014).

Over a decade ago, researchers like Windschitl (2000) illuminated the potential of the World Wide Web (WWW) for teaching and learning. However, the nation's classrooms have struggled to develop the pedagogy and curriculum needed to implement quality-learning experiences (Windschitl, 2000). As Web access has expanded, the complexity of the WWW has transformed. Society moved from being users of Web 1.0, where most users browsed for information, to Web 2.0 (DePietro, 2013). This new version, dubbed in 2004, allows users to read, write, and produce (DePietro, 2013; Greenhow, Robelia, & Hughes, 2009). Today, Web 2.0 allows for collaboration using Wikis or Google tools, communication through social networks like Facebook or MySpace, and creative works such as podcasts or blogs, to name only a few. These technologies are redefining the teaching and learning within a classroom (DePietro, 2013; Tu, Sujo-Montes, Yen, Chan, & Blocher, 2012).

The following section frames the dilemma of how this midwestern district strives to implement blended learning as an improved method of teaching and learning. Evidence of this issue at the local level may be reflected in a flat graduation rate along with a pronounced racial and economic achievement gap. Research is cited to reflect how blended learning holds real promise in the larger educational environment. Important

terms associated with the problem are defined, and also defined is how this study is significant for both the local district but also all K to 12 institutes. The guiding research question is framed around the conceptual framework and reflects the intent to explore teacher perceptions of blended learning. Furthermore, a thorough review of the literature illustrates how blended learning enhances communication, collaboration, and engages the learner, as well as provides opportunities for self-regulation and individualization. Finally, the potential implications of the findings of this study are discussed followed by a summary.

### Definition of the Problem

The district leaders would like to personalize education, prepare students for the future, and offer an educational program where students can perform in an ever-changing global society (Minnesota School District, 2012). Staff from the target public school, located in the midwestern part of the United States, has developed a student-centered vision for teaching and learning enhanced through technology. In order to accomplish this vision, the district has, over the past 2 years, provided students K to 12 with iPads, particularly one-to-one iPads in Grades 4 to 12, with the final phase in the fall of 2014 with the distribution of iPads to Grades 11 and 12 (Minnesota School District, 2012). In addition, the district administrators have provided a LMS as a tool for instruction and student work. A LMS is a software platform designed to manage and deliver educational material (Psycharis, Chalatzoglidis, & Kalogiannakis, 2013).

Throughout the implementation of the one-to-one devices and the use of the LMS, the staff has been provided ongoing PD (T.C., personal communication, March 4, 2015).

Staff members lead the PD; in addition, teacher leaders serve as learning support mentors as the faculty implements the one-to-one computer program (T.C., personal communication, March 4, 2015).  District funds are used to pay teachers to participate in summer technology courses, which are taught by the district's technology specialists (D.R., personal communication, December 27, 2014).  The ongoing PD has encompassed Moodle, integrating iPads, and using various technology tools with the hope to garner the biggest impact on student achievement (T.C., personal communication, March 4, 2015). The district funds have also provided one-to-one devices and ongoing PD to the staff with anticipation of improving teaching and learning.  Even with these district and teacher supports and training, some high school students may not be receiving a personalized educational experience or increased 21st century skills because teachers may not be using or may be underusing the technologies and the LMS (D. R., personal communication, December 27, 2014; D.Z., personal communication, December 19, 2014; T.C., personal communication, January 11, 2015 & March 4, 2105).

With the advancements of the WWW, Internet, and computer accessibility, along with education's need to advance teaching and learning, the rise of blended learning has emerged.  While technology is expensive and schools are faced with bleak budgets and greater class sizes, public education is turning to technology (Fassbender, Lucier, & Fink, 2014; Horn & Staker, 2011) because it has the power to entice passive listeners to active participants (Jacobs, 2010).  Blended learning has the potential to allow technology to do what it does best–engage the learner (Delialioglu, 2012; Francis, 2012).

Shifting the burden from teacher-centered to student-centered instruction, blended learning delivers opportunities for educators to engage all learners while instructing students in small groups to concentrate on individual needs (Chubb, 2012; Kliger & Pfeiffer, 2011). However, as with any approach to teaching, there are some disadvantages. Blended learning requires a financial commitment by the institution to acquire the technological needs and resources. Moreover, faculty must be willing and dedicated to learning the new technology and use it in their practice (Capo & Orellana, 2012; Kliger & Pfeiffer, 2011). The ability for teachers to adopt this new pedagogy has become more important as studies reveal it increases student engagement and achievement (Al-Ani, 2013; Anwar, 2011; Delialioglu, 2012; Downing, Spears, & Holtz, 2014; Williams & Chinn, 2009). Because of the positive impact blended learning has shown on student learning (Köse, 2010; Yapici & Akbayin, 2012) and the difficulty teachers have implementing blended learning (Aslan, Huh, Lee, & Reigeluth, 2011; Comas-Quinn, 2011; Kliger & Pfeiffer, 2011), understanding teachers' perceptions about blended learning and LMSs was the emphasis of this study.

The use of LMSs is a convenient way to provide access to content, assess students' knowledge, provide feedback, and promote collaboration and communication (Porter, 2013); furthermore, LMS is supported by research to be an effective tool for teaching and learning (Sánchez & Hueros, 2010; Ssekakubo, Suleman, & Marsden, 2013). In recent years, K to 12 institutes are following the lead of institutes of higher education and delving into this new 21$^{st}$ century pedagogy (Kotzer & Elran, 2012). LMSs, such as Moodle, have emerged as one of the leading products in the open source

LMS market with over 60 million users (Porter, 2013).  With the effort in technical support along with the needed teacher and student expertise, many institutions are continually reevaluating their decision to adopt and support LMSs.  Furthermore, limited qualitative research has been done to explore teachers' perceptions of using Moodle to engage students in the learning process and how Moodle can be used as a formative assessment tool to promote self-efficiency and inform teacher practice (Al-Busaidi & Al-Shihi, 2012).  This study was designed to explore teachers' perceptions about the practice of using blended learning to assist students in the learning process.

## Rationale

### Evidence of the Problem at the Local Level

The district leaders aligned their goals based on Minnesota's Education Act of 2013 (Minnesota Department of Education, 2014b; Minnesota School District, 2012). The Education Act of 2013 is also known as the World's Best Work Force initiative. This initiative ensures that every district in the state is addressing five goals (Minnesota Department of Education, 2014d). As stated earlier, the goals are that all racial and economic achievement gaps between students are closed and all students graduate from high school as well as students are ready for college and careers (Minnesota Department of Education, 2014b; Minnesota School District, 2012).  While the district is making progress towards accomplishing these goals, there is still progress to be made.

Overall, the district is continuing to make growth in these three areas.  The Multiple Measurement Rating and the Focus Rating, which measure the achievement gap and graduation rate, show a result of 82.4% of students are scoring proficient or better,

and 95.4% graduated in 2014 (Minnesota Department of Education, 2014c). This

graduation rate is up from a fairly flat trend over the past 5 years, which wavered

between 89 to 92%, and in fact, the high school did not make Annual Yearly Progress

according to the federal standards of NCLB for 2 of the 5 years based on the graduation

rate (Minnesota Department of Education, 2014c). While the school continues to make

progress on the achievement gap, only 50% of African Americans were "on track" for

success in 2014 (Minnesota Department of Education, 2014c). In fact, more than 50% of

African Americans only partially met or did not meet the 2014 student achievement

levels in both math and science and 40% in reading (Minnesota Department of Education,

2014c). Similar results are seen in the economically disadvantaged students (Minnesota

Department of Education, 2014c). Overall, the vision for enhanced learning through

technology offered by district publications is to address the achievement and economic

gap by offering a personalized educational approach and increasing student engagement.

However, according to several leaders within the district, the high school teachers

struggle to effectively implement the blended learning approach questioning whether

students will be engaged in the learning process, which leads to improved achievement

(D.R., personal communications, December 27, 2014; D.Z., personal communication,

December 19, 2014; T.C., personal communication, January 11, 2015 & March 4, 2015).

**Evidence of the Problem from the Professional Literature**

Researchers have indicated that blended learning environments hold real promise

to enhance student learning and improve teacher pedagogy (Delialioglu, 2012; Wang

2011). However, many researchers contend that much more could be done to understand

how a LMS influences teaching and learning (Klobas & McGill, 2010; Ssekakubo et al., 2013). Delialioglu (2012) revealed that students were more engaged in meaningful learning with blended learning but believed further research is needed to investigate instructor practices with technology and the impact on student engagement, teachers' daily tasks, and teaching practices in general. Similar conclusions were reached by Al-Ani (2013), in attempting to research effective teacher use of the learning management system Moodle. Furthermore, Al-Busaidi and Al-Shihi (2012) investigated instructor satisfaction using a LMS, but clearly believed that more research is needed to understand the outcomes of using a LMS for the instructors and what are the factors for instructional satisfaction. Blanco and Ginovart (2012) recommended further research should be completed on using an LMS as an e-assessment tool. Blanco and Ginovart and Wang (2011) provided evidence that e-assessments serve as a positive method for formative assessment, but Blanco and Ginovart argued that continued work with e-assessment tools across various disciplines would deem useful.

Overall, researchers such as Al-Ani (2013), Blanco and Ginovart (2012), and Delialioglu (2012) believed the integration of technologies into teacher pedagogy directly impacts student learning. These same researchers conceded the need for further research into teacher practice and satisfaction, which will directly address the Minnesota district's problem of underutilization or lack of utilization of technologies and LMSs (Al-Ani, 2013; Blanco & Ginovart, 2012; Delialioglu, 2012). In conclusion, understanding what influences an instructor to assimilate technologies into his or her practice can serve as a model for greater Information and Communication Technologies (ICT) integration.

**Definitions**

*Authentic learning:* Also known as meaningful learning, these are the skills needed for college and career readiness. These skills include cognitive skills-like communication, collaboration, research, and problem solving; content skills–knowledge of various disciplines; learning skills–capable of ownership of learning; and transitional knowledge and skills–ability to understand and manage context, personal, financial, and cultural decisions (Darling-Hammond et al., 2014).

*Blended learning:* Blended learning occurs when students learn at least part of the time in a brick and mortar environment using online technologies with the student having control over the pace, path, and methods used (Horn & Staker, 2011).

*E-assessment:* Electronic tools that support formative assessment (Daly, Pachler, Mor, & Mellar, 2010).

*Engagement:* Engagement occurs by students when activities are meaningful, and students are actively involved with the acquisition of knowledge (Alrushiedat & Olfman, 2013; Delialioglu, 2012).

*Formative assessment:* An activity that centers on a learner or group of learners who provide information and receive feedback allowing for the modifications of teaching and learning by both the learner and the instructor (Daly et al., 2010).

*Information and Communication Technologies (ICT):* The application of computers and communication networks including the Internet (Webb, Gibson, & Forkosh-Baruch, 2013).

*Learning Management System (LMS):* This software platform is designed to manage and deliver educational material. It offers institutional, student, and faculty support, teaching and learning processes, along with course development, evaluations and assessments (Psycharis et al., 2013).

*Learning style:* Learning is a cognitive activity that differs from learner to learner. E-learning or electronic learning involves four learning styles: active and reflexive learning, sensitive and intuitive learning, visual and verbal learning, and sequential and global learning (Despotović-Zrakić, Marković, Bogdanović, Barać, & Krčo, 2012).

*Moodle:* The term Moodle stands for Modular Object-Oriented Dynamic Learning Environment (Tiantong &Teemuangsai, 2013). It is an open source, free learning platform that allows teachers to create or upload lessons, quizzes, assignments, or discussion forums, which are all linked to a grade book (Ursache, Herman, Poka, & Vaju, 2012). Moodle allows the integration of various resources, including HTML documents, multimedia resources such as graphics, videos, or audios to be uploaded and shared (Brandl, 2005).

*NCLB:* No Child Left Behind (NCLB) is a law enacted by the United States during the Bush administration articulating a commitment to pursuing more equitable education outcomes and a pledge to provide well-qualified teachers for all children (Darling-Hammond et al., 2014).

*Self-regulated learning:* Self-regulated learning denotes that learners work towards managing and directing their learning and learning activities to obtain deeper knowledge (Wang, 2011).

*Technology integration:* The concept of merging face-to-face lecture with online technologies to produce learning through a variety of approaches (Al-Ani, 2013).

*Web 2.0:* Technologies that encourage learners to creatively design, collaborate, and share their personal learning (Tu et al., 2012). Web 2.0 includes social networks, creative works like podcasts or video casts, blogs, and the expansion of knowledge through wikis or webpages (Greenhow et al., 2009).

*WebCT:* A widely used LMS that has similar capabilities as Moodle (Sanchez & Hueros, 2010).

## Significance

District leaders have adopted a student-centered vision for teaching and learning enhanced through technology. The integration of one-to-one technology is just been recently dispersed to students K to 12, especially most recently to the high school students. Teachers have been provided ongoing PD on using the iPads, integrating software, and Moodle (T.C., personal communication, March 4, 2015). However, Moodle and the technology, in general, is still not consistently used or used to its fullest potential by all content area teachers at the high school level (D.R., personal communications, December 27, 2014; D.Z., personal communication, December 19, 2014; T.C., personal communication, January 11, 2015 & March 4, 2015). Selecting teachers who already use ICT, I was able to understand what challenges teachers currently face or have confronted in the past, and how they perceived blended learning impacts teaching and learning, as well as how the LMS was used for formative e-assessment. The information garnered from this study will allow district decision-makers to understand how to move forward

and discover how much time, and what kind of support or PD is needed for successful implementation.

In addition, with class sizes continuing to grow and federal mandates on students making yearly progress, teachers are now held accountable for student learning (Darling-Hammond et al., 2014). This new paradigm of accountability encourages continuous improvement and districts to provide meaningful learning (Darling-Hammond et al., 2014). Blended learning, especially LMSs, can change teaching and learning (Haythornwaite & Andrews, 2007; Horn & Staker, 2011; Klobas & McGill, 2010). The use of blended learning and LMSs can foster students to communicate and collaborate, allow for individualized teaching and learning, and provide 21st century technology skills (Aslan et al., 2011; Blanco & Ginovart, 2012; Delialioglu, 2012; García-Valcárcel, Basilotta, & López, 2014; Tiantong & Teemuangsai, 2013). Furthermore, as more K to 12 schools move toward blended learning and LMSs, it is important to understand how to assist the teacher in delivering authentic learning (Web et al., 2013). Policymakers and educational leaders have an obligation to adopt policies where blended learning truly personalizes learning and bolsters teaching and learning (Horn & Staker, 2011).

## Guiding/Research Question

As more K to 12 schools turn to blended learning, the use of LMSs has become more prevalent as a tool to manage and deliver educational material (Psycharis et al., 2013). While research at the university level appears more widespread, very little research has been conducted at the high school level. The research that has been conducted at this level suggests additional research should be conducted to determine

how teachers use an LMS, what challenges they face, and what impact an LMS has on teaching and learning (Delialioglu, 2012; Klobas & McGill, 2010; Ssekakubo et al., 2013). By understanding the challenges and successes of high school teachers who are ICT users, this study could assist the district to understand why some teachers are not using or may be underusing the technologies and their LMS. Based on my review of the literature, my theoretical framework, and my purpose, I collected and analyzed data to answer the following question.

1. What are the teachers' perceptions of how blended learning influences teaching and learning?

To further explore this central research question, the following subquestions were explored:

1. How do teachers use blended learning to assist students in the learning process?

2. What do teachers perceive as the successes of using blended learning for teaching and learning?

3. What do teachers perceive as the challenges of using blended learning for teaching and learning?

4. To what extent do teachers use Moodle as a tool for formative assessment? If teacher do not use Moodle, why is that?

5. How do Web 2.0 tools assist teachers with blended learning?

**Review of the Literature**

Blended learning, a cross between face-to-face learning and the integration of technology, is framed in connectivism and social constructivism learning theories (Al-Ani, 2013; Kliger & Pfeiffer, 2011; Kop & Hill, 2008). Blended learning occurs when students learn at least part of the time in a brick and mortar environment using online technologies with the student having control over the pace, path, and methods used (Horn & Staker, 2011). LMSs can manage and deliver individualized instruction based on pace, path, and methods (Despotović-Zrakić et al., 2012). Furthermore, the latest version of the web, Web 2.0, allows teachers and students to create and share their learning. Web 2.0 is defined as technologies that encourage learners to design creatively, collaborate, and share their personal learning (Tu et al., 2012). This section shows the research indicating that blended learning encourages engagement, collaboration, communication, self-regulation, and individualization (Blanco & Ginovart, 2012; Delialioglu, 2012; García-Valcárcel et al., 2014; Tiantong & Teemuangsai, 2013). In addition to highlighting the advantages, this literature review includes information about the challenges and barriers related to integrating blended learning into teaching and learning as well as disadvantages of using such systems.

**Theoretical Framework**

This study was grounded in the connectivism and social constructivism theories. Connectivism and socioconstructivism have been touted as the learning theories for the digital age (Al-Ani, 2013; Kop & Hill, 2008). As the new epistemology, connectivism indicates that learning occurs when knowledge is shared, stored, and manipulated to

create new knowledge (Del Moral, Cernea, & Villalustre, 2013; Dunaway, 2011; Jenzen, Perry, & Edwards, 2012). The integration of ICT has caused a shift from classical epistemology to a new epistemology based on active learning and a shared creation of knowledge (Dede, 2008; Mattar, 2010; November, 2010). Social constructivism is where teachers and students work together to explore and create knowledge (Paily, 2013). For this reason, it is not surprising that the newest version, Web 2.0, is redefining teaching and learning (Lata, 2013; Paily, 2013).

Siemens and Downes (as cited in Kop & Hill, 2008) initiated the focus on this new epistemology in their blogosphere in 2005 by discussing the idea of shared knowledge. Siemens (2005, 2008) postulated since learning occurs without teaching and people can teach themselves, knowledge is centered on connecting various information sources to the learner. Recent reports advocate that the skills needed for college and career readiness concentrate on problem-solving, research, communication, and collaboration to make learning a meaningful experience (Darling-Hammond et al., 2014). Technology can function as a tool to respond to these skills; for this reason, it is judicious of educators to embrace technology to generate active learners. However, a simple transfer from offline to online teaching does not equate to good pedagogy; instead, teachers must learn to blend their practices (Francis, 2012; Garrison, 2011; Haythornwaite & Andrews, 2007).

After Chickering and Gamson (1987) laid out the Seven Principles of Good Practice for Undergraduate Education, ICTs have become a resource for teaching and learning (Chickering & Ehrmann, 1996). These seven principles stipulate active learning

occurs through collaboration, communication, engagement, effective feedback, and diversity in teaching and learning (Chickering & Gamson, 1987). To meet these needs, Siemens (2008) and Dede (2008) predicated that educators must adopt the tools and new approaches to teaching and learning to echo the behaviors of these digital natives. Tools like blogs, wikis, social networking, podcasts, video, and programming, along with a great deal many more, are all part of the rapid growth of ICTs.

**Current Literature**

As online learning sweeps across the United States, K to 12 schools look for ways to use technology to offer a more personalized approach to teaching and learning. Advancements in technology have created a surge in blended learning. In addition, institutions are employing LMSs to manage and deliver educational material (Psycharis et al., 2013).

Current research shows that blended learning enhances communication and collaboration and engages the learner (Aslan et al., 2011). While blended learning and LMSs have shown to have many advantages, researchers have also revealed there are challenges or barriers to integrating blended learning into teaching and learning (Comas-Quinn, 2011). Researchers also indicated that LMSs, like Moodle, allow teachers to impart individualized instruction, deliver e-assessments, and provide feedback allowing for self-regulation (Blanco & Ginovart, 2012).

**Learning management systems and Moodle.** LMSs are a web-based learning platform that manage and deliver educational material. They offer institution, student, and faculty support, teaching and learning processes, along with course development,

evaluations, and assessments (Psycharis et al., 2013).  LMSs or virtual learning

environments also allow students to participate in asynchronous discussion threads,

synchronous chat rooms, and other methods of communicating learning (Ssekakubo et

al., 2013).  There is a variety of LMSs available, including ATutor, WebCT, LotfiVCL,

and Moodle (Lotfi, Nasaruddin, Sahran, & Mukhtar, 2013).

Moodle, a management system created by Martín Dougiamas, a WebCT

administrator, is based on cooperative learning allowing the teacher to create a student-

focused environment (Sanchez & Hueros, 2010).  Moodle is based on the constructivist

and social constructivist approach to learning where learners are encouraged to create

their knowledge (Janzen et al., 2012; Ursache et al., 2012).  This open source platform

has a many great features.  Moodle allows a teacher to create or upload lessons, quizzes,

assignments, or discussion forums, which are all linked to a grade book (Ursache et al.,

2012).  Items can be time restricted, password controlled, along with restriction of

completion times (Brandl, 2005).  In addition, Moodle allows the integration of various

resources, including HTML documents, multimedia resources such as graphics, videos,

or audios to be uploaded and shared (Brandl, 2005).  Based on its ease of use, this system

is used in over more than 200 countries and 80 languages (Tiantong &Teemuangsai,

2013).

Tiantong and Teemuangsai (2013) examined how student team achievement

divisions used Moodle to determine if enhanced student achievement occurred.  The

authors justified the study believing that teaching and learning needed to serve diverse

groups of students, involve problem-solving skills, incorporate 21st century technology,

and collaboration (Tiantong & Teemuangsai, 2013). Working in four to five member groups, the students collaborated to accomplish a learning goal and then participated on individual quizzes to determine the degree of performance. The authors concluded that Moodle was an engaging tool that allowed for the development and organization of collaborative learning activities (Tiantong & Teemuangsai, 2013).

A similar study was directed by Despotović-Zrakić et al. (2012). In their study, the researchers wanted to use Moodle to create an adaptive course and compared it to the effectiveness of a nonadaptive course (Despotović-Zrakić et al., 2012). The results revealed that teachers were able to adapt the course by adjusting teaching materials and activities without the programming knowledge (Despotović-Zrakić et al., 2012). Adaptivity, which considers a student's learning style, allows for individualization of a course. Ninety-five percent of the students favored this approach, as well as it allowed them to achieve better results and higher grades (Despotović-Zrakić et al., 2012).

The Moodle quiz tool enables teachers to provide automatic feedback to diagnosis student learning (Brandl, 2005). For feedback to be effective, it must appear while the student is thinking about the concepts to provide results for improvement (Brookhart, 2012). Moodle's quiz modules allow for fill-in the blanks, multiple choice, true-false, matching, and short answer (Brandl, 2005). Blanco and Ginovart (2012) conducted a study to explore how Moodle quizzes contribute to formative e-assessment. Undergraduate students completed a series of online e-assessments to assess their understanding of concepts within two first-year courses in math. Results showed that Moodle quizzes are an appropriate tool to inform students of their performance because it

provides immediate feedback without burdening the instructor (Blanco & Ginovart, 2012). The authors remarked that future research in other disciplines, besides math, could contribute to our knowledge of how the Moodle quiz module is an effective tool (Blanco & Ginovart, 2012).

**E-assessments and self-regulation.** Formative assessment has long been touted as an important practice, which enables educators to modify their practice and students to self-regulate his or her learning (Black & William, 2009). Self-regulation has become important because of its relationship to learning effectiveness (Wang, 2011). Self-regulated learning permits learners to work towards managing and directing his or her learning and learning activities (Wang, 2011).

According to Black and William (2009), formative assessment consists of five key strategies:

1. A tool to clarify and share learning objectives;

2. Classroom discussions and other means that create evidence of student understanding;

3. A tool to provide feedback to progress the learner forward;

4. A tool to enable students to assist one another; and

5. A tool to activate students to self-regulate.

The types of activities that a teacher offers should enact these strategies. In addition, other researchers (Brookhart, 2011; Hattie, 2012; Hattie & Timperley, 2007) have discussed the importance of timely, focused feedback. ICTs have the potential to serve as an effective formative assessment tool because feedback can be immediate allowing

students to self-regulate (Gullen & Zimmerman, 2013; Wang, 2011). Heritage (2010) indicated in her report to the Council of Chief State School Officers that formative assessment can be used as a test, but more importantly, it should be a tool that yields timely information about students' learning status relative to a "gap" of knowledge (p. 15).

Wang (2011) used an experimental design method to understand if a web-assisted formative assessment would increase self-regulation and learner effectiveness. In four junior high school classes, students obtained the same e-learning materials, but half the group received a Web-based formative assessment prior to conducting the normal Web-based test (Wang, 2011). Results revealed students who used the Web-based formative assessment tool had better self-regulated learning behaviors and improved learning motivation (Wang, 2011). For this reason, formative e-assessments can supply learners with effective feedback enabling self-regulation and engagement in the learning process.

**Engagement and collaboration in a blended learning environment.** School districts are employing technologies with the goal of creating a student-centered meaningful learning environment. Researchers have argued that good practices encourage active learning and that various Web 2.0 tools offer students a chance to engage in the learning process (Anwar, 2011; Chickering & Ehrmann, 1996; Williams & Chinn, 2009). Technology permits students to be active learners in ways that are unlike traditional education by promoting new and effective ways to communicate and collaborate, which occur in a blended learning environment (DePietro, 2013; García-Valcárcel et al., 2014).

Delialioglu (2012) investigated student engagement in blended learning project-based environments versus a lecture based learning environment. Blended learning unites face-to-face learning with the use of technology (Kliger & Pfeiffer, 2011). Multiple surveys were distributed to determine motivational aspects, and Delialioglu reported that students had a significantly higher engagement in project-based blended learning environment than traditional classroom learning. Delialioglu warranted that future research should be completed to investigate instructor practices in blended learning environments and their impact on student engagement along with how blended learning impacts teachers' daily tasks and practices.

Köse (2010) surveyed high school students' opinions about blended learning. Both teachers and students used blogs and podcasts, which are voice recordings, to present suggestions, information, or learning. A blog is a website that logs entries in reverse chronological order (Köse, 2010). The blogs, podcasts, and social networking allowed students and teachers to share information, communicate, and collaborate (Köse, 2010; Turban, Liang, & Wu, 2011). In addition, blogs have shown to be an effective tool for formative assessment (Joshi & Babacan, 2012). Köse revealed that these Web 2.0 tools played an important role in student engagement and their belief in their achievement.

Downing et al. (2014) studied the use of student-generated videos in a blended learning environment. University students reported a better understanding of the course material and a greater engagement with the use of technologies (Downing et al., 2014).

In addition, students conveyed an increase opportunity to examine real-world problems that required collaboration and critical thinking (Downing et al., 2014).

Blended learning has shown to be beneficial for students (García-Valcárcel et al., 2014; Gedik et al., 2012; Klobas & McGill, 2010; Tu et al., 2012).  Gedik et al. (2012) and García-Valcárcel et al. (2014) revealed that blended learning students were more engaged and motivated to learn, especially when the activity had real-world relevance as well as personalize pedagogy and served as a tool to provide effective feedback (Francis, 2012; Horn & Staker, 2011; Kliger & Pfeiffer, 2011).  In addition, students conveyed flexibility and cooperation in learning, including synchronous and asynchronous opportunities, along with the opportunity for individualization (García-Valcárcel et al., 2014; Gedik et al., 2012).  Similar results are conveyed by Tu et al. (2012) with an emphasis on students' ability to share and connect information to create an authentic learning community.  Blended learning follows the principles of Chickering and Gamson (1987), which stipulate active learning occurs through collaboration, communication, engagement, effective feedback, and diversity in teaching and learning.  While blended learning has shown to be beneficial, it also has its challenges.

**Challenges of blended learning.**  Several issues have been raised with blended learning.  Both students and teachers have complained about the time commitment to gain an understanding of the technology (García-Valcárcel et al., 2014; Gedik et al., 2012; Sanchez & Hueros, 2010).  Users of ICT need technical support and need to understand the perceived usefulness of the technology for attitudes to be affected (Capo & Orellana, 2012; Gedik et al., 2012; Sanchez & Hueros, 2010).  In addition, teachers are

concerned about students becoming too dependent on being told what to do or how to do it; therefore, they are unable to manage their learning (García-Valcárcel et al., 2014; Tu et al., 2012). Similarly, LaRoche and Flanigan (2013) determined, after surveying 200 undergraduates to assess if technology enhances engagement, that students were disengaging in class activities by going on Facebook or checking their emails. LaRoche and Flanigan did not dispute that engagement can occur in a blended learning environment; instead, they stated that when the instructor comes prepared and presents opportunities for real-world problem-solving using technology, students do not disengage.

Comas-Quinn (2011) explored teachers' experiences using blended learning. The mixed methods study involved both participant observations and a survey followed by three semistructured interviews. Comas-Quinn identified three reoccurring themes–technical issues, the lack of online tools to integrate courses activities or assessments, and shortage of time as the main factors in some of the teachers' abilities to effectively integrate technologies into the curriculum. The researcher suggested an increased understanding of the issues facing teachers to develop more effective training programs (Comas-Quinn, 2011).

Lin, Wang, and Lin (2012) reported similar results. A multiple case study using three Chinese language arts teachers employing observations and interviews showed how a pedagogy technology model worked. The study revealed that teachers' ICT integration was affected by many factors including ICT equipment, support, curriculum, culture, teaching load, leadership, and most importantly teacher buy-in (Lin et al., 2012). Lin et

al. suggested further research to corroborate the evidence be conducted and to understand teachers' personal attributes of ICT integration.

**Conclusion**

Blended learning and LMSs have the potential to personalize pedagogy, engage the learners, and serve as a tool for e-assessments to provide effective feedback under the right circumstances (Francis, 2012; Horn & Staker, 2011; Kliger & Pfeiffer, 2011). Researchers have suggested that LMSs allow students to engage in collaboration, allow teachers to individualize teaching, and provide effective feedback when using Moodle's quiz module, which enables self-regulation (Blanco & Ginovart, 2012; Despotović-Zrakić et al., 2012; Tiantong & Teemuangsai, 2013; Wang, 2011). In addition, blended learning encourages engagement and collaboration, which is essential for good teaching practices, according to Chickering and Ehrmann (1996). Researchers (Delialioglu, 2012; Downing et al., 2014; Köse, 2010) indicated that student engagement and collaboration increased when students worked together to examine real-world problems.

While there are plenty of advantages, there are also challenges to blended learning. Blended learning requires teachers and students to be trained on the technologies (Gedik et al., 2012; Sanchez & Hueros, 2010). In addition, time can be a restraint to using technology effectively (Comas-Quinn, 2011). Teachers need technical support to employ technology effectively (Gedik et al., 2012; Sanchez & Hueros, 2010). However, teachers must understand that learning is more than gaining knowledge about certain content that true erudition occurs when students effectively collaborate, communicate, and engage in the process (Tu et al., 2012). Therefore, continued research

is vital to explore how teachers who use blended learning perceive that it influences their teaching practices and assists students in the learning process. Educators in the field may deem it important to understand the successes and challenges of blended learning, how Moodle is used as a tool for formative assessment, as well as what components of Moodle assist teachers with their learning outcomes.

**Implications**

The use of a LMS like Moodle can aid students in the active learning process, all while improving teachers ability to manage and deliver 21$^{st}$ century educational material (Aslan et al., 2011; Blanco & Ginovart, 2012; Delialioglu, 2012; García-Valcárcel et al., 2014; Tiantong & Teemuangsai, 2013). This study provides insights into how high school teachers are using blended learning to engage learners, and whether teachers use Moodle as a tool for formative assessment to provide effective feedback allowing for regulation of learning. In addition, teacher participants revealed their perception of how technology impacts individualization of teaching and learning. Moreover, teachers indicated the successes and challenges in blended learning allowing the district to understand if further PD is needed to assist teachers in consistently using technology and Moodle to its full range of use. This information on blended learning could also prove useful to the district in the decision to renew this LMS. Overall, this study allows other K to 12 institutes an understanding of how blended learning can engage learners and provide for collaboration, communication, self-regulation, and individualization.

**Summary**

Advancements in technology have created an increase in districts moving towards blended learning. Researchers have indicated that blended learning environments hold real promise to enhance student learning and improve teacher pedagogy (Delialioglu, 2012; Wang, 2011). Current research indicates that LMSs allow teachers to impart individualized instruction, deliver e-assessments, and provide feedback allowing for self-regulation (Blanco & Ginovart, 2012). In addition, research has shown that blended learning enhances communication, collaboration, and engages the learner (Aslan et al., 2011). While blended learning and LMSs have shown to have many advantages, researchers have also revealed there are challenges to integrating blended learning into teaching and learning such as time, support, and costs (Comas-Quinn, 2011).

These advantages and challenges can be noted in the case of a Minnesota K to 12 public school. While this district's staff wants to personalize and enhance the learning experiences and shift instructional approaches to student-centered blended learning, some students may not be receiving a personalized educational experience or increased 21st century skills because their school teachers may not be using or may be underusing the technologies and the LMS (D.R., personal communication, December 27, 2014; D.Z., personal communication, December 19, 2014; T.C., personal communication, January 11, 2015 & March 4, 2015). Based on the foundations of the connectivism and social constructivism learning theories, in this study I explored how teachers who use blended learning perceive that it influenced their teaching practices and assisted students in the learning process. As part of the research process, I explored the teachers' perceptions of

the successes and challenges of blended learning and how Moodle was used as a tool for formative e-assessment, as well as how Web 2.0 tools assist teachers with blended learning.

In the next section, I present and describe how the qualitative case study was conducted to understand teachers' experiences and perceptions, along with why this design was suitable based on the research questions. The study's location is described and criteria for selecting the participants. In addition, procedures for working with participants are postulated.  Furthermore, the data collection processes are revealed to include four different forms of data and how analysis occurred simultaneously.  The analysis processes are disclosed as well as the findings.  The study's limitations and the real potential for positive social change in education are also discussed.

Section 2: The Methodology

**Introduction**

The purpose of this study was to explore how teachers who use blended learning perceive that it influences their teaching practices and assists students in the learning process. As part of the research purpose, I explored teacher perceptions of the successes and challenges of blended learning, including how Moodle was used as a tool for formative e-assessment. The results of this study identified the specific components of Moodle that assist teachers in addressing student learning outcomes.

To understand this phenomenon, I conducted a doctoral project study. A doctoral project study is different from a traditional dissertation. A project study involves the investigation of a local problem to promote positive social change. Furthermore, a project study includes a project outcome component that is designed to assist the local district with the problem. To investigate the problem, this project study is comprised of a qualitative case study, which enabled me to develop a relationship with the participants to develop a deep understanding of the phenomenon.

Twelve teacher participants, employed in a Minnesota high school, were purposefully selected based on their frequent use of Web 2.0 technologies and Moodle. I do not work for the district and have no preestablished relationship with any of the educators; therefore, a gatekeeper assisted in selecting potential participants. Participants were ensured their rights via a written consent form. Any and all information generated from the study is being safeguarded and will be appropriately destroyed after 5 years.

Data were collected using a questionnaire, three observations, and documents in the form of teacher screenshots, along with subsequent interviews. All data were collected and analyzed simultaneously to generate potential themes using an online computer-assisted qualitative data analysis software called Dedoose. The four different types of data ensured validity and reliability through triangulation, by seeking discrepant cases, and through member checks. However, qualitative case studies have their limitations. To contend with these limitations, a descriptive narrative was written enabling the readers to identify with the study's phenomenon and results. This project study has a real potential to bring social change to education through understanding how blended learning influences teaching and learning.

## Overall Design Method

A qualitative case study was conducted to understand the teachers' experiences and perspectives of using information and communication technologies to improve teaching and learning. Qualitative research explores a problem to understand a phenomenon. The relevant literature justified the problem exists within other institutions (Creswell, 2012; Merriam, 2009). The literature review and theoretical framework reflect that learning occurs when knowledge is shared and constructed together (Paily, 2013; Siemens, 2008). Chickering and Gamson (1987) believed ICT is a good resource in providing for active learning, which includes collaboration, communication, engagement, self-regulation, and individualization. Current researchers have revealed technology can improve student learning, but further research is needed to investigate teacher pedagogy and satisfaction (Al-Ani, 2013; Delialioglu, 2012).

In qualitative studies, the researcher is the primary instrument for collecting the data from a limited number of participants (Creswell, 2012; Merriam, 2009). Data were collected through a questionnaire, interviews, observations, and documentation allowing me to construct how the participants' feel and behave towards using technology and the LMS. The data were analyzed to identify overarching themes to develop a meaningful portrayal of the study (Creswell, 2012). These themes and findings related to the existing research.

For this particular research, a qualitative case study was used to explore one particular program in a unique system (Creswell, 2012; Merriam, 2009; Yin, 2014). Particularly, this project study meets the requirements for an instrumental case study because I examined a particular case, namely teacher perceptions about blended learning. Instrumental case studies elucidate a particular issue, and, in general, allow the researcher to develop a relationship with the participants allowing for a deep understanding to be developed (Creswell, 2012; Merriam, 2009).

Comparatively, there are many research designs that are not suitable. Quantitative designs, like an experimental design, try to explain the impact of an intervention, correlational designs show relationships, and survey designs take a sample of a large population. In this study, I am not introducing an intervention, as in Wang's study (2011), and I am not showing a relationship between two or more variables explained in a correlation study nor conducting a survey study, visible in Köse (2010) and Delialioglu (2012). Furthermore, a survey might only reveal what the teachers think versus what they practice (Creswell, 2012), which Delialioglu calls for as future research.

In addition, surveys do not allow participants flexibility in their answers, which allows the researcher to garner a deep understanding of the phenomenon.

Other types of qualitative studies are not suitable. A narrative analysis only allows people's stories to be studied through text, and a ground theory design assists in building or modifying a theory and involves a core category or one in which all categories are related (Creswell, 2012; Merriam, 2009). Therefore, the aforementioned designs would not fit with the data collection or analysis to understand how the data answers the research question about teachers' perceptions of how blended learning influences teaching and learning. I used an instrumental case study to explore the central research question along with the following subquestions: How do teachers use blended learning to assist students in the learning process? What do teachers perceive as the successes of using blended learning for teaching and learning? What do teachers perceive as the challenges of using blended learning for teaching and learning? To what extent do teachers use Moodle as a tool for formative assessment? If teacher do not use Moodle, why is that? How do Web 2.0 tools assist teachers with blended learning?

In summary, an instrumental case study provided particular insight into this site's particular phenomenon. Data were collected through a questionnaire, interviews, observations, and documents allowing me to construct how the participants' feel and behave towards using technology and LMSs. I developed a positive, open, and honest relationship with the participants allowing for a deep understanding to be developed (Merriam, 2009).

**Location and Participants**

The study's site is located at one of 220 high schools within the state of

Minnesota (Minnesota Department of Education, 2014b).  The high school has

approximately 3,300 students and about 176 teachers with 72% of the faculty having a

master's degree or above (Minnesota Department of Education, 2014c).  Additionally,

more than 61% of the high school faculty has over 10 years of experience, and 36% have

3 to 10 years' experience (Minnesota Department of Education, 2014c). The day is

scheduled in four block periods with each class lasting 86 minutes in length.  There are

four terms in a year, and each course offers one credit per term.  The school offers 26

advanced placement courses and requires students to complete 60 credits to graduate.

The study involved a purposeful sample of 12 participants.  Participants were

intentionally selected based on their use of Web 2.0 technologies and Moodle.  A

gatekeeper provided an initial list of the potential participants (Creswell, 2012).  To be

considered a potential participant, the gatekeeper used the following criteria: (a) The

content area teacher must use the district's LMS and other Web 2.0 tools, and (b) the

content area teacher must use the blended learning approach at least 3 times per week.

Teaching faculty who reflect the greatest use of blended learning as an instructional

methodology and widely use technologies like Web 2.0 tools and Moodle were selected

as potential participants. The gatekeeper for this study was the high school's technology

integration specialist, which the district employs three, one at each of the division levels.

The gatekeeper understands the faculty's integration of technology and can provide

advice on which staff members would be willing to be participants.  After I received a list

of names, I contacted the potential participants via email and provided them details surrounding the study as well as their requirements (see Appendix B).

**Protection of Human Participants**

I do not work at the study's site or supervise any of the members and have no established relationship with any of the individuals. The gatekeeper only provided a list of potential participants. Upon receiving a list of potential teacher participants, I contacted the individuals via email (see Appendix B) as well as sent them the consent form. The individuals were provided the purpose of the study, detailed description of the procedures and time commitment, and the promise of confidentiality along with a pledge to disturb or disrupt as little as possible. I also guaranteed anonymity by assigning each participant a pseudonym. In addition, participants were told they are volunteering for this study and could chose to withdraw or refrain from answering at any time in the process.

If an individual agreed to be a participant, he or she returned the written consent form. This consent form outlined their rights, including confidentiality, and guaranteed protection from harm, therefore causing no impact on the evaluation or employment of the individual (Creswell, 2012; Yin, 2014). These forms along with any relevant papers are stored in a locked cabinet in my home. Furthermore, all data collected electronically are secured using password protection. All data will be destroyed after 5 years of completing the study by shredding or completely erasing the evidence from the computer including the deleting the cookies.

**Data Sources and Collection Procedures**

I collected data using a questionnaire, observations, interviews, and documents in the form of computer screenshots.  According to Yin (2014), having multiple sources of evidence adds to a study's construct validity.  Construct validity is "the accuracy with which a case study's measures reflect the concepts being studied" (Yin, 2014, p. 238). Since each data source has strengths and weakness, I used multiple sources to corroborate and augment the other sources adding further strength and validity.  Furthermore, I made inferences from one data source that I explored using the next data source.

The participants were contacted via email to initiate the collection of data.  They were sent the initial contact email again (see Appendix B) reminding them of the role of the researcher, the purpose of the study, detailed description of the procedures and time commitment, and the promise of confidentiality along with a pledge to disturb or disrupt as little as possible.  Future appointments and questionnaires were established via emails, and follow-up confirmations were sent both 1 week prior and again 1 day beforehand.

**Questionnaire**

The questionnaire (see Appendix C) was the first data source.  The questionnaire was delivered via email as an attachment.  Participants were sent an initial email announcing the questionnaire would be sent to them within the week. After 1 week, I send the participants an email with the six open-ended questions.  It required the participant to include his or her name, which was kept confidential by assigning the participant a pseudonym.  The answers to these questions provided insight into

formulating the interview questions.  A follow-up email was sent out 1 week after the

questionnaire to any participants who had yet to complete it.

The questionnaire consists of open-ended questions.  Each question allowed the

participants to explain their answer.  The questionnaire provided general information

about how the participant uses blended learning and technology. The questionnaire was

short, with only six researcher-created questions to not overburden the participant.  This

information was used to support the previous theories reflected in the literature as well as

guide subsequent observations and interviews (Creswell, 2012).

**Observations**

As the questionnaire was being completed by each of the participants, the first

two of three observations were scheduled and conducted with each of the participants.

Each observation lasted 1 hour in duration.  Observations provided evidence on how the

participant used blended learning in his or her teaching practice along with the successes

and challenges of such.  Field notes were carefully taken using an observation sheet (see

Appendix D), which I generated.  The observation sheet included the name, date, start

and finish times, grade level and content area, along with the number of students in

attendance.  The observation sheet provided an area to describe the setting, along with a

two-sided chart to describe the activities and behaviors of the participant along with the

reactions and my initial interpretations.  During the observations, I looked for how the

teachers' lesson used technology and the LMS to engage the students and allowed for

collaboration and individualization of learning.  I also observed if the teacher used

technology and the LMS as a tool for formative e-assessment to provide feedback -

allowing students to self-regulate.

**Documents**

During an observation, a teacher's computer monitor or LCD projector may have

been displaying or using a particular Web 2.0 tool. To record the computer monitor's

display, I logged the information on the Protocol for Computer Screenshots form (see

Appendix E). The self-created protocol required the teacher's computer monitor to

display the Web 2.0 tool being used for e-assessment, collaboration, and communication

among students, or providing some feedback to the student. These screenshots assisted in

documenting the phenomenon or exposing the use of blended learning or the use of the

LMS. During the interview, if applicable based on the protocol, a request was made for

the teacher to provide computer screenshots. To protect the students', teachers', and

district's information, I ensured all personal information was blackened out.

Afterward, documents were organized in an electronic folder. All documents

were either sent via email or scanned into my personal computer and saved as a jpeg

image. All jpeg images were organized according to the content that it displays–that is,

assessment, collaboration, communication among students, or providing some feedback

to the student. The screenshots were also organized according to the participant.

**Interviews**

An individual semistructured interview occurred after the second observation but

before the third observation. The interview took place in a quiet location free from

distractions. Each interview followed a data recording protocol (see Appendix F) and lasted 30 to 45 minutes in length.

The protocol outlined the purpose of the study, how the information has been kept confidential, how long the interview lasted, and the interview questions. The protocol, shown in Appendix F, includes sample questions, but these were adjusted after initial analysis of the questionnaire and conducting two observations. The participants were asked open-ended, researcher-created questions followed by probes. The interview questions, which were broad in nature, asked questions that allowed the participants to elaborate on their questionnaire and observations. The interview questions addressed the research questions to explore the use of blended learning and the use of technology for teaching and learning. Follow-up probes were used enabling the participant to clarify and provide more details about their perceptions of what I observed along with how the students interacted with technology.

I took notes during the interviews; however, all interviews were recorded with permission from the interviewee and then transcribed. The recordings permitted me to focus on the interview and the participant's nonverbal cues, and it allowed for more accuracy by transcribing words verbatim (Merriam, 2009). I used my computer as the recording device. All recordings are saved on the computer and an external hard drive. All data will remain confidential and be destroyed after 5 years of completing the study.

This information garnered from the data collection was carefully organized as it was collected. The data were organized according to the participant and then cross-referenced by the four different types of data (Creswell, 2012). Furthermore, duplicate

paper copies of all forms of data were stored before analysis began with each set of data.

In addition, I captured my reflections and initial notions in a field journal, which was

organized according to the major topic. I gathered and analyzed the data providing for a

deeper understanding of the research problem.

### Data Analysis Procedures

All data were analyzed and reviewed for emerging themes as it was collected.

Notes were taken in the field journal as tentative themes or hunches emerged. New data

were compared with existing data to substantiate themes. As I collected each piece of

data, I logged it my field journal adding credibility to my study. Details of how the data

were collected, how themes or categories are derived, and how I made decisions were

recorded throughout the data collection and analysis process.

To assist in analyzing the data, computer-assisted qualitative data analysis

software was utilized. Dedoose, an inexpensive online tool, is a cross-platform

application that allows qualitative data to be organized and categorized. The text was

uploaded, which was divided into meaningful, logical segments. I then coded and sorted

the data according to the emerging categories, themes, and by research question. The

established theoretical and conceptual framework founded in the literature review shaped

the analysis.

As categories emerge, new data were compared, and themes or categories were

refined. During analysis, categories must address the research questions, "be mutually

exclusive," and "conceptually congruent" (Merriam, 2009, p. 186). By this, a particular

piece of data should only fit in the one category (Merriam, 2009). Categories were

reduced in number to emerging themes, which were then included in my descriptive narrative.

The study's results are internally valid based on the triangulation of data (Merriam, 2009; Yin, 2014). By supporting the findings through multiple sources of evidence, I have observed the evidence converge (Yin 2014). The convergence of evidence and member check ensures the participant's perspective was understood and interpreted accurately. Furthermore, it was important that each instrument and piece of data collected was valid and reliable.

**Questionnaire**

The answers provided on the open-ended questionnaire provided an initial understanding. To analyze the data, I asked myself "What did that mean?" and coded according to emerging themes as well as aggregate the frequencies by the patterns that are revealed (Stake, 1995). Important implications were derived from multiple appearances. The participant's answers were referenced during the interview allowing for member checking, as well as, provided an opportunity for participants to crystallize their thinking. The use of multiple sources of information should reflect consistency allowing for the validity of the data. The information provided on the questionnaire and subsequent data collections added to the thick description.

**Observations**

Observations were conducted to triangulate the emerging findings and provide evidence that the behavior was occurring. It was important to establish a rapport with

each of the participants to make them feel at ease during the actual observation. This

connection started via email but was furthered by introductions prior to the observations.

During observations, I recorded highly descriptive field notes along with

reflective comments on the observation protocol form (see Appendix D). Subsequent

observations allowed for patterns to be established and generalizations to form (Stake,

1995). Generalizations were coded and organized according to emerging themes. Not

only did observations allow me to observe the behavior necessary to validate the

statements on the questionnaire, but also the observations allowed me to look for data

that challenged the emerging findings. Looking for variation or direct rivals throughout

the data collection process allowed more confidence in the findings. An example of

variation would be investigator bias, or when the participant behaves differently, which is

also known as experimenter effect. To combat this effect, I tried to remain unobtrusive

and tried to refrain from making any comments throughout the observations. However,

while some participants' shared information during the observation, their behaviors were

consistent at each of the observations.

**Documents**

The computer screenshots further validated the behaviors and findings. Computer

screenshots were requested of the teacher's Moodle page if it was being used to show an

e-assessment, collaboration, or communication among students, or if it displayed

feedback to the students. The protocol, shown in Appendix E, for screenshots, ensured

the images endorsed the research questions and added reliability to the case study. After

all the documents were collected, documents were coded with the terms e-assessment,

collaboration, communication or feedback and further validated emerging themes. Participants also validated the purpose of the document when the request was made at the interview.

**Interviews**

Interviews allowed me to ensure the previously collected data made sense and were consistent with each other. During the interview, the participants corroborated their answers from the questionnaire. Each participant also substantiated what occurred during the observation. To triangulate the information, I referred to the questionnaire and observation during the interview. Participants provided clarification or added more depth to their response. I also looked for variation that could support alternative explanations. If answers were different, I asked follow-up probes to seek clarification. Through the time spent collecting the four different types of data, I purposefully looked for variation adding to my credibility as a researcher.

All interviews were recorded and carefully transcribed. Using Dedoose, transcriptions were compared allowing for categories and themes to emerge. Since the transcriptions are fairly long, I did not ask the interviewees to review the transcripts; however, complete transcriptions were available to participants upon request. Instead, I asked the interviewee to verify the emerging themes from his or her data (Merriam, 2009). Using member checks, I guaranteed that the information was reliable and valid by referring to each data piece specifically as themes emerge (Merriam, 2009; Yin, 2014).

In summary, using four types of data allowed me to triangulate the data. Adequate engagement in the data permitted me to look for discrepant cases. I used a

field journal to record the data collection and analysis process. Data were analyzed and coded using Dedoose, a computer-assisted qualitative data analysis software. Participants had an opportunity to elaborate or clarify the findings using member checks. All of these strategies promoted validity and reliability to the study.

## Limitations

Limitations of this study are based on its design. Since this case study focused on a specific high school setting, generalizability to the broader educational system is limited. Instead, readers can learn vicariously by examining the rich narrative. In addition, case studies have a small, purposeful sampling, which limits the researcher's ability to make broad statements based on the phenomenon. Qualitative studies are also limited based on the researcher being the primary instrument for data collection and analysis. The data were collected and analyzed only by me; therefore, bias can naturally occur. Furthermore, data obtained from the participants are contingent on truthfulness.

## Findings

The findings revealed participants shared strong beliefs that blended learning facilitates individualization, collaboration, increased organization and engagement, provide real-world relevance, and student-centered learning. Moodle was only one tool that some teachers used for formative assessment allowing students to self-regulate. The challenges they discussed were students disengaging in the learning process, device and infrastructure concerns, as well as the time to integrate technology effectively.

The data collection consisted of a questionnaire, three observations per participant, an interview with each participant, and the collection of screen shots. I

collected data for 3 weeks during May of 2015.  Carefully evaluating all the sources of

data allowed me to obtain a convergence of data as well as seek discrepant cases (Yin,

2004). A couple of discrepant cases were uncovered and were included in the findings.

To validate the data, members were emailed with themes allowing the members to

solidify the findings. Data focused on how the teachers perceived blended learning

influenced teaching and learning, how the teachers used technology, and how the students

responded to the blended learning approach.  Throughout the data collection, all

information-including the questionnaire responses, observational notes, transcribed

interviews, and screenshots-were stored electronically as well as printed and stored in

corresponding participant folders.

**Participant Portraiture**

In order to provide a context for understanding the results and in order to develop

a rich narrative about these findings, I will introduce each of the participants by providing

a brief profile of each teacher (Stake, 1995).  A pseudonym has been used to maintain the

anonymity of each participant.  The participants, who consented to be part of the study,

were five females and seven males.  Each of the 12 participants taught various high

school content areas like English, literature, math, Spanish, special education, science, or

a computer tech class.

The first two high school teachers were Molly and Deirdre. Molly welcomed her

students at the start of each class with a friendly hello and some upbeat music playing.

She appreciated problem solving and served as a resource for students. She stated,

Um, one of the rules in my classroom and this is not 100% true, but one of

my rules is that I do not answer questions. So if a student comes up and

asks something, I try to be a resource, and I try to facilitate their figuring

out the right answer.

Deirdre, who worked in the same department as Molly, was fairly new to teaching but

had her first career in Retail Management where she told me she attended many

technology conferences to understand point of sale equipment and technology. In a visit

to her classroom, I noticed Deirdre was a soft-spoken teacher who provided individual

attention to each student. Deirdre was a "traveling teacher" and provided instruction in

three different classrooms but all within the same high school.

Lynn and Malcolm worked in the same department. During the observation,

students seemed to enjoy Lynn as a teacher for they were sharing personal information

with her as well as spending time outside of class just hanging out. Her personality along

with the novel she selected for discussion fostered open and difficult conversations like

suicide or rape among students. She and her students had lengthy conversations about

what is right and wrong in society. Malcolm had years of experience both in the business

world and in education. He stated he valued face-to-face teaching but recognized the

importance of integrating technology because our society is part of the global world;

therefore, students must use the tools that facilitate this globalization. He had the

students generate an iMovie where they collaborated and used technology to create a

documentary.

In a different department, Bob demanded all students participate; however, he valued anonymity.  During the interview, he verbalized this philosophy to me by stating, "You are going to participate in my class.  No one needs to know that you participate in my class, but you have to participate because I am going to wait for you."  He motivated students to be actively involved in the lesson by using technology to poll his students.

John, who worked in the same department as Bob, managed a well-structured, organized classroom.  During the observations, he transitioned from activity to activity fluently as he utilized various computer software packages.  During the interview, he shared that he used web-conferencing as a tool to reach students outside the school day.

Jimmy and Jacob both worked in the same department.  Jimmy, a seasoned teacher, remarked that he loves to add funny but relevant animations, music, or videos, which captured the attention of his students.  While Jimmy could be considered more 'old school' in his teaching approach because he likes to rely on paper copies stored in a file cabinet, he has written and published an iBook that he has his students use.  On the other hand, Jacob was a young teacher who has a background in information technology.  Jacob stated, "You know all these students have grown up using technology, so I actually enjoy when they can incorporate that," revealing he recognized the importance of using technology.

Brandon worked at integrating technology into his lessons; however, fully admitted that he was underusing technology.  He stated, "And maybe I am just not good enough, and I'm not skilled enough with using the iPad outside of just simply using it for notes, email me assignments, that kind of thing." Brandon further remarked, "I see the

benefits. I see the distractions. I think for me it is a 50/50 at this point in terms of my opinion." Brandon saw both the successes and the challenges to using the blended approach.

In contrast, Thomas integrated the one-to-one approach by utilizing the technology to access the course text and other resources. He said he learned a lot on his own through what he calls "self-exploration." Thomas has led several PD courses both for the district and even for school staff outside the district.

The last two participants both worked for the same department. Georgia was similar to Brandon and felt she has a lot more to learn, but she stated that she loved the iPads and Moodle. She had the students create a collaborative slide presentation where they interpreted the lyrics to a Spanish song, which the groups presented every Monday throughout the semester. She had the motto "I do the best I can with the time, energy, and resources that I have." Kathy heavily integrated the iPads into her instruction by using a flipped classroom approach. A flipped classroom is one in which the teacher has recorded all of her presentations and shared them on her Moodle page for students to receive instruction from these recorded presentations prior to class time. This flipped classroom approach allowed Kathy to use her class time to answer questions and work with students individually. The next section presents the perceptions of these 12 high school teachers regarding blended learning.

**Perceptions of Blended Learning**

Teachers' perceptions of blended learning varied and included the value of such for individualization of student learning, enhancement of organization, increased

engagement, communication, and collaboration. In addition, teachers thought blended

learning allowed students to self-regulate in a student-centered environment while

offering real-world relevance. Teachers elaborated on how technology integration can

allow for the individualization of student learning. Individualization of student learning

was seen as enrichment, providing choices and personal assistance, as well as

encouraging student research. Deirdre, the soft-spoken teacher who traveled from class

to class, indicated, "I would say for a large percentage of students their performance has

increased because they have more ways of doing things and more ways of representing

their learning." Blended learning was viewed as a way to offer choices but also fostered

organization.

Many of the teachers also felt technology impacted both their organization as well

as their students. John, the teacher who ran a structured class commented,

> I think it is a great organizational piece, especially with the remedial kids.
>
> You don't have the issue of "I don't remember what the homework was."
>
> All that is at the tip of a finger. So organizational-wise, they know where
>
> all their homework is. They know what the pages are, and they have the
>
> problems in front of them. So we've definitely combated that, but I think
>
> the ease of obtaining that is pretty nice.

John was one of a four of the participants who had all of his lessons, notes, and book

pages organized on his Moodle page allowing for easy access for the students.

Many teachers also felt blended learning fostered real-world relevance to the

students' learning and their teaching. Deirdre wrote in her questionnaire, "I find that

incorporating technology can aid students in seeing the relevancy of what we are learning to the world outside of school." More than half of the participants agreed with Deirdre's sentiments and how the integration of technology will affect life after high school either in college or one's careers.

Additionally, teachers felt that blended learning assisted students in collaborating and communicating with others. Malcolm's students worked in small groups collaborating to create an iMovie. To complete this project, students emailed staff members as well as communicated with each other using Google Docs and Gmail. Malcolm confessed,

> I am asking the kids before they interview to email the people and to try and set up the interviews that way. That is the way to do it. You might know these people, but the right way is to give them the opportunity let them schedule the time. I had another student to take it upon herself to send the questions. She emailed the questions beforehand. It is something that I had not thought of, but it is a nice common courtesy. So, I think it whether it's emailing people to set it up, whether it is the videotape portion, whether it is recording their voice and editing this all together. I think there are so many things about this project that will be able to use as they move on. To put together, whether it is a video project for college or if it is a video resume. I don't know. I see so many things changing–a project like this addresses so many issues that it can't help but being beneficial to them as they move ahead.

This project required students to use real-world skills, such as, collaborating and communicating to create a documentary.

Similarly, a few of the teachers used Moodle or other web tools for formative assessment. These teachers felt students were more engaged in the learning process and were able to self-regulate and develop a better understanding of the concepts. Bob, the teacher who requires all students to participate, remarked, "I can get more formative assessments from the kids without putting them on the spot. You've seen that; I've shown you that. I collect more grades. All the kids are engaged now. I make them engaged now." Teachers, who used technology for formative assessment, recognized how the tools can provide immediate feedback for the students and themselves.

At the same time, the teachers had many concerns regarding blended learning. They shared their concerns over student disengagement, technical issues, and time. Deirdre addressed disengagement by stating, "There is definitely a pocket of students where the technology has inhibited their ability to focus and has been a distraction for them." Many of the teachers felt students could easily become disengaged from their learning due to things that do not pertain to the class like using their device to engage in gaming and social media.

There were also several technical issues expressed as challenges for the teachers. These issues focused on infrastructure, home Internet access, the device itself, and charging. Since Kathy relied heavily on the Internet to conduct her flipped classroom, she revealed her concerns with infrastructure. It seems that the high velocity of students connecting to the Internet at the same time has created some problems. She commented,

The beginning of the school year like the first week was a nightmare, and

that was our first year that we had 3,300 kids on iPads. So you have no

idea what is going to happen in the building until you fire up with teachers

and everything almost 4,000 iPads and computers.

In addition to Kathy, many others shared the connectivity concerns too. Teachers

believed things have improved since the beginning of the year, but it was still not without

flaws.

The device itself appeared to be a concern for many. Many students had broken,

or cracked screens on their device and the students refused to do without or get a loaner

because the repair process would take a lot of time. Thomas stated,

The other thing is the damage returns timeframe is a struggle. And it is

great that the devices are being fixed, and it's great we have loaners. But

the kids know their device is going to be gone for that long, so they don't

want to do it because of that. And that is a significant hurdle, I think,

when they now value their device and now their device needs to go away

for 2 or 3 weeks to be prepared and that they are using broken devices

because they need to use the loaners for so long.

Thomas remarked that damaged devices and waiting for the iPad to get repaired

impacted his teaching and student's learning.

Besides cracked screens or extensive wait period for the iPads to get back from

being repaired, teachers shared their frustration about the students not having their

devices charged and the lack of charging capabilities for students. Lynn, the teacher who

fostered class conversations, labeled these students "'Wall Huggers' because I have so many kids that just want to sit against the wall so they can charge." While there were many challenges, teachers confirmed the numerous benefits of conducting research, the sharing of documents, note taking, and conducting Web-based projects as well as using the iPads for formative assessment outweighed the challenges.

In summary, the teachers articulated a great many benefits and challenges in using technology to implement the blended learning approach. Many teachers found they were able to individualize their teaching and engage students in the learning process. Also, most teachers felt students were able to collaborate more effectively. Technology also assisted many teachers with formative assessment allowing students to self-regulate. However, teachers also experienced many challenges like students disengaging in the learning process, device and infrastructure concerns, as well as the time to integrate technology effectively. Each of these ideas is further discussed in the next section as findings are aligned with the research questions.

**Influences and Successes of Blended Learning**

Many themes emerged in regards to teachers' perceptions of how blended learning influences teaching and learning. These themes spanned individualization and student engagement to increased communication, collaboration, and organization. In addition, teachers articulated students were able to self-regulate in a student-centered environment allowing for real-world relevance. Table 1 reflects the themes for how blended learning influences teaching and learning, which are similar to the teachers'

perceptions of the successes of blended learning. This table also reflects the challenges of using blended learning, which is discussed later.

Table 1

*Synopsis of Teacher's Perceptions of Blended Learning*

| How influences teaching and learning | Successes of using blended learning | Challenges of using blended learning |
|---|---|---|
| Individualization | Individualization | |
| Student engagement | Student engagement | Disengagement |
| Real-world relevance | Real-world relevance | Technical issues |
| Self-regulation | Self-regulation | Time |
| Communication | Communication | |
| Collaboration | Collaboration | |
| Student centered | Student centered | |
| Organization and convenience | Organization and convenience | |
| | Formative assessment | |

The teachers said that blended learning allowed them to individualize their teaching. Individualization of student learning was seen as enrichment, providing choices and personal assistance, as well as encouraging student research. Enriching the students in their learning was important to Lynn. She stated,

Sometimes students will be like "Hey have did you see that video that has to do with XYZ?" and I'll be like "No, pull it up; Airplay it. Let's take a look at it." Which sometimes is awful and sometimes it isn't, so having those opportunities for enriching learning and teaching has been very beneficial to me.

Lynn was observed using these educational moments as a way to add to her student's knowledge.

Using technology to provide choices for students to represent their learning was also important to some participants. Kathy, the teacher who has flipped her class, wrote, "I try to provide different learning opportunities for similar learning targets." Deirdre also referenced individualization. On her questionnaire, she wrote, "Blended learning provides choice for students and me, daily." These teachers used technology as a tool to provide students choices in their learning.

Thomas also felt blended learning permitted the teacher to personalize his teaching. He wrote, "Blended learning has greatly allowed for the personalization of learning in my classes. I provide them the open-ended assignments allowing them to choose the technology they prefer." Overall, all 12 participants felt the integration of technology has positively influenced how they individualized teaching.

A common feeling shared by the participants was that technology could increase student engagement. A couple of teachers affirmed the importance of running a structured class where students do not have the time to disengage and use their device to play games or visit social media sites. Bob responded, "They are more engaged. To put a hard number on it is hard. But they are more engaged." These participants acknowledged that technology engages students in the learning process.

Lynn discussed how she had the students complete a previous project using their iPads, and it was the first time in 6 years that she had every student engaged. "Every single kid was doing something that they were supposed to be doing. So, I haven't seen

that before." She feels "these iPads have been quite amazing." While technology engaged the learner, blended learning also encouraged organization.

Georgia, the teacher who loved the iPads and Moodle, discussed how blended learning was more student centered as well as how it was convenient and easily organizes the materials for both her and her students. She believes that it puts the responsibility of learning on them.

> Where I post most of, well all of, everything we do in class is pretty much
>
> on Moodle. I have Moodle divided by – there is a resource section, there
>
> is an activity section, there's practice for our summative assessments. . . .
>
> There is a quizzing section specific to our vocabulary. . . . But the kids
>
> always have access to that. So, I think everything is at their fingertips;
>
> they don't have to wait for me to come over if they have a question in
>
> class. If they are at home, they don't have to necessary wait till the next
>
> day. Oh, I lost my vocab. sheet; I can't do this because I don't know all
>
> the vocabulary. It's there; they can go get that information. It puts the
>
> responsibility of learning [on them]. I have the responsibility of providing
>
> them with the opportunity; they have the responsibility of you know, um,
>
> taking advantage of those opportunities. So, I think they are more in
>
> control of the learning process.

Kathy also felt those same sentiments. She remarked, "I think some kids would say they hate iPads, . . . but it is because they are held accountable on a daily basis where they

cannot hide behind anything." Both to Kathy and Deidre saw technology assists with organization and student accountability.

Deirdre held her students accountable by "embed[ding] a Google calendar onto our course Moodle site. This calendar displays daily work assignments and summative assessment dates." Technology allowed students to access class materials from the teacher's Moodle page and be responsible for their learning whether they were in class for the day, or if they missed it due to sports, illness, or vacation.

Many teachers used the blended learning approach to help students receive immediate feedback, thus, allowing students to self-regulate. Using technology as a tool for formative assessment was quite common in the math and Spanish classes. Jacob used various tools to provide students instant feedback. He stated, "They get immediate feedback on what their score was and that gives me the chance, usually for those shorter ones, I'll just go over every single question." E-assessments also allowed him to understand his teaching and students' learning. He remarked, "It tells me if only 10% of students got the question right, well now I know that I either need to have to better cover that in the future or maybe it was a bad question." Overall, there were a handful of teachers that were passionate about using technology as a tool for students to self-regulate and for them to be provided a quick and easy snapshot of students' understandings.

Using technology for collaboration influenced teaching and learning. I observed students working collaboratively in both Georgia's and Malcolm's classrooms. In

Georgia's class, one group presented their "Proyecto de canciones" or Songs Project.

Figure 1 reflects the group's requirements.



**Proyecto de canciones**

Vas a tomar parte en una presentación de una canción a la clase. La profe va a darte un género y tienes que escoger una canción original (no puede ser una canción de otra clase de español), interesante, apropiada, etc. que representa bien el género. Usa *itunes latino* y *google* para buscar la información que tienes que presentar a la clase. Usamos Moodle y Google Docs para seleccionar y documentar la información de las canciones.

- **CD with song**
  - Block
  - Name of song
  - Name of artista/group
  - Names of students
  
  } Use a Sharpie pen to label

- **Student Lyrics Copy:** Lyrics in Spanish with key words missing (email to [name of teacher] as an attachment and have a hard copy to submit in class as well)

  - Search Google for lyrics
  - Title this as follows: Bloque # + Song Title + Artist(s) → example: Bloque 1 "Mi Primer Millón" Basilos
  - Cut and paste into a Microsoft Word document
  - Clear formatting at the top left of Microsoft Word
  - Put into Times New Roman, 12 point font
  - Put into 2 columns
  - Number the lines by 5s
  - There should be enough missing words (1 per line or every other) to make the activity last a week and be challenging to the students in class but not impossible; consider vocab, grammar, theme, imagery, etc.) 5 of the missing words need to be imagery/symbols of the theme; highlight these words on the master copy
  - Label the chorus (*coro*), instrumental bridges (*instrumental*) and any repeat lines (*bis #*)
  - If you have questions, reference the songs that have been modeled in class

*Figure 1.* Georgia's collaborative class project. This group project is an example of blended learning. It required students to work collaboratively using various technology tools to connect the outside world into their learning.

The groups researched Spanish music genre, download the song, found the lyrics in both Spanish and English, as well as created a group PowerPoint with various elements like five relevant facts, popular song or album of an artist in that genre, instruments played, to name only a few. This project required the students to work together using

various technology tools, like Moodle, Google docs, and PowerPoint to create and share a relevant project.

Molly commented about how she used technology as a tool for collaboration, "for group work (communication, working in Google Docs), using the tech itself (writing blogs posts, making movies), and as a direct resource from me to them." Molly felt technology was useful and helped students control their behaviors.

Both of the Spanish teachers along with the one English teacher, a literature teacher, and the computer tech teacher commented about real-world relevance. Kathy said, "We use technology to make connections to the Spanish-speaking world." During one observation, students were using Pinterest to research ten Spanish speaking countries to find attractions, hotels, music, art, et cetera. The students used this information to write a narrative paper in Spanish. The students seemed to enjoy the exercise and were sharing where they would like to travel.

Using the device to organize and manage materials was important to many of the participants. John commented about how technology assists the remedial students he teaches in helping them stay organized. Deirdre agreed with John and said, "I think that for students who struggle with organization, the technology piece can be really helpful for them." Students using technology to stay organized also impacted teacher organization.

Jacob felt that students using technology as a tool for organization also assisted him in using his class time better. He posed,

The biggest thing is saving time. I mean, honestly, in just thinking about

it; it saves so much time. Not passing stuff out. Not collecting it. Any of

that is…much, much quicker for them to download notes and be ready to

go. Um, I would say that is one of the biggest positives. It's nice too

because their work can be a lot cleaner and everything. If they want to

erase something on technology it erases perfectly. Um, that is probably

not one of the biggest benefits, but I would say the biggest thing is it is a

time saver.

However, Lynn commented about how confusing turning in papers electronically can be.

She discussed the multiple ways students turn in their work to her and how it can be

challenging for her to track them down.

A lot of them email them to me. So that is a bit little annoying too,

because you have the kids that are emailing it, the kids that are going

through eBackback, the kids who have paper copies. So you have track

down. "Okay. Did you turn this in? Did you turn it paper copy, on your

iPad, or through your email?"

Lynn has figured out how to stay organized by communicating with her students.

eBackpack is an app that works with iPads allowing teachers and students to share

documents, turn in assignments, write comments, and provide audio or video feedback to

name a few.

In summary, the teachers expressed many benefits for using the blended learning

approach. Teachers said technology allowed them to individualize their teaching by

providing choices while simultaneously engaging the learner.  It was also articulated that students were more organized enabling them to find their assignments easily.  Blended learning fostered a student-centered environment where the responsibility shifts to the learner.  Furthermore, using technology for e-assessments empowered students to self-regulate.  Increased communication and collaboration were also viewed as a positive effect of the blended learning approach.  While technology has its many positives, it also has its downsides, which will be described in the next subsection.

**Challenges With Using Blended Learning**

Teachers identified many challenges to using blended learning for teaching and learning.  These challenges were previously compared with the successes in Table 1.  The most recognized by the participants was student disengagement and problems with the devices.  Brandon was very passionate about how students are using the device to disengage in his class.  He stated,

> In no way, shape, or form am I more entertaining than what they can do on
>
> an iPad.  And so the iPad is a distraction.  I am always going to lose
>
> because if at any second, and I mean by the second, if at any second I am
>
> not entertaining enough for them, or if I am not informative enough for
>
> them, they can tune me out and go to the iPad and be entertained or
>
> informed that a way.  Usually they are not using it to acquire knowledge
>
> or enrich their learning it's to distract themselves.  It is to entertain them.

During Brandon's first observation, there were approximately 12 students in his class, and he had to convince them to engage in the learning.  Brandon had the students

completing what he said was a daily task. He set a timer and moved around the room to motivate and assist students; however, one student did nothing for the entire time. Later on during the observation, the students were encouraged to use their iPads to work on a writing assignment. However, during the work time, students engaged in various personal conversations, complained about the assignment, and a couple of them sat idle. Again, students did not appear to be motivated to complete the task, and the teacher encouraged them to use their time wisely. In general, using technology did not engage or motivate the students to complete the task at hand.

In the second observation, which was a different course from the first observation, the students were working on a type of self-study. They were to use the computers and complete various tasks for each unit. Students were observed texting, listening to music, or playing games with only three of the nine students working at their online coursework. One student was disengaged the entire 50 minutes; instead, he went on to social media and played games. Brandon had little interaction with the students, nor did he correct the students for using their devices for noneducational purposes. When asked about the student's behaviors, Brandon indicated that it was a self-paced online class, and they needed to be motivated to complete the course.

Jacob was similar to Brandon in that he was frustrated with students using their iPads for accessing game sites versus a tool for learning. When I asked him what he would like to see changed, he adamantly responded saying the school needed to

Block games! Just block every single game. . . . You know what, if they

have a Smartphone, they can play games on there. But the thing is when

are taking notes or in class, if they have their phone out, I can assume they
are doing something wrong.  When they have their iPad out, I have to
assume that they are making the right choice and taking notes.  I can't
constantly be walking around monitoring, and even when I do, it takes
them literally 2 seconds to switch back to notes.  So, I would say the
biggest thing…just go ahead and block all games.

When I observed Jacob, I saw one student do exactly that.  A student swiped over from
the game and went back to his class notes without Jacob understanding the student was
off task.  This switch took about one-tenth of a second.

On the other hand, Malcolm and Thomas saw what others called distractions, like
gaming, as something the students needed to have almost like a mini break. Malcolm
stated,

I mentioned the distractions; just making sure the kids are on task.  Over
time, I have also gotten use to understanding that sometimes they need
something of a distraction at some point or a little of a way to kind of let
off steam or what the right word is.  But it's something that they are not
intently focused all the time.

Overall, students were seen using their device for gaming during many of my
observations.  Sometimes students only used them before the start of class, but most of
the time, students were using their device to disengage during direct teacher instruction or
class work time.

Besides disengagement, teachers also remarked on how about various technical issues. These technical issues covered issues like having cracked iPad screens or not having their device due to servicing, students not having them charged for the day, and students being locked out of their device because of inappropriate downloading. Malcolm and Lynn commented about how students were downloading inappropriate apps creates more work for them. Malcolm explained why this occurred when he said,

There is an issue that I have had with kids being locked out because they

have prohibitive apps on there. And so then they have to take them off,

and they don't always have the either the time or the desire to do that.

When students do not have access to the classes' resources, the teachers must find the time to make paper copies of the material.

Many of the teachers complained about the time it takes students to get their iPads serviced because the iPad became broken or cracked. However, Thomas revealed that the district has a daily checkout, loaner program for students. According to Thomas, this program is not widely known. Jacob voiced this concern about students missing their iPad when he said,

The biggest thing is that every single semester I have had a student with a

broken iPad, and they will go over 3 months without having it. It is the

biggest pain in the world when they tell us, "Use the iPads, use the iPads,

use the iPads." And they expect us to have everything incorporated for the

iPads, but it takes the student 3 months to get it back.

Jacob's frustration was similar to Lynn's and Malcolm's because now he must take the time to make paper copies.

Almost all of the teachers expressed their frustration about how students do not come with their devices fully charged for the day, and the school does not supply charging stations or a class set of chargers. Lynn was fully aware of this problem and was working with others to brainstorm for possible solutions for the district. She stated,

I think the classes need to be more conducive to having all this

technology. Especially when it comes to charging stations or having some

place for the kids can just go and charge their iPads on a daily basis. And

kids are just not responsible; they lose their chargers all the time. Their

needs to be like a class set of chargers in the room that don't go anywhere.

They just like in a cart, and you can charge it here or something. And the

cords need to be longer than the 3 feet. They need to be like 10-foot

cords.

During my observations, there were many students who would move to the back of the room to charge their device. On several occasions, students asked a fellow classmate to borrow their charging cord. Overall, the students did not disrupt the class, and they immediately reengaged in the learning activity. Another challenge many teachers perceived concerned the school's Wi-Fi infrastructure.

Several teachers expressed concern about the building's infrastructure or hotspots; however, participants articulated the infrastructure had vastly improved from the

beginning of the year.  Bob, who relied on using technology to poll his students, expressed his frustration about how he gets "kicked out."

> I wish we could figure out why some kids get kicked out more than others.
> It is because of Wi-Fi.  You know the way it was explained to me, for
> every Wi-Fi you have so many parking spots that can be occupied by
> devices.  So, when they do this, "Hey we are going to vote for student
> council during homeroom" and 3,000 students are trying to sign on to the
> same site, well then it just goes bonkers and crashes.  So, they need to work
> through those bugs.

Lynn had similar concerns.

> Lynn stated, "They need more hotspots in the building. Um, I find it a little
ridiculous that they have AppleTV, and I have access to stream movies from it, but our
servers are too slow."  Not having enough access points was only one concern.

> Depending on technology to be available and accessible during your class time
can also be challenging.  One day when I was observing, Moodle and eBackpack were
down.  Teachers had to devise another plan or find an alternative for disseminating the
information.  Kathy, who used Moodle to flip her classroom, commented,

> Well, two days ago everything went down.  Moodle was down; eBackpack
> was down.  So you unless you have a prep first block [which she did], so I
> could quick go grab all the files that I needed and then emailed them to the
> kids so they could access. . . . So you have to be able to punt and make
> some quick decisions on ways to make it work otherwise.  You know, so

you quick make photocopies, you put something under the document

camera, you know what I mean…you kind of go old school with some of

the stuff and just be able to work around it.

Having consistent Wi-Fi access at school was a frustration for many, but only Thomas

brought up home Internet access for students. Since his course was Web-based, he

surveyed his students each semester to understand who might not have access at home.

He understood the disadvantage those students might have, so he (like Lynn) thinks of

solutions. During our interview, he suggested the district think about adding Wi-Fi to the

buses. While he recognized the expense, he believed "it is a great opportunity to have

them utilize their device more effectively on the bus." These challenges are addressed,

whether broken devices or Wi-Fi issues, by teachers investing additional time to devise

alternatives.

Integrating technology takes time, and time was seen as an issue for most of the

participants. When I asked Jimmy his biggest challenge, he responded with

That is an easy one, the time component. Just finding the time to get your

head around learning the technology, but just also in a very thoughtful

manner of figuring out how this is going to be a benefit in your classroom

and how to seamlessly incorporate that into your day. And not just for

incorporating for incorporation sake but to have it actually have it enhance

learning.

Brandon felt that sometimes he was scrambling to stay one-step in front of the students.

He confessed,

I have to make sure that I am on top of updating Moodle and sometimes

that is a daunting task. A lot of times on Monday I am scrambling. "Like,

oh my God. How many things do I have to put on Moodle yet?" So, it

challenges me a little bit to stay on top of things.

John viewed time as an issue in general for teachers, whether they are integrating

technology or not. He stated, "Time is always an issue. . . . The time piece of

frontloading is something that people don't want to go through, and at times I don't want

to go through." Most of the participants saw blended learning required frontloading or

planning ahead. Overall, some participants perceived that using technology saves time

while others saw it consuming more of their time.

In summation, teachers expressed many challenges with the blended learning

approach. Student disengagement, as well as problems with the device, was recognized

as challenges. Students were frequently seen visiting game sites versus engaged in the

lesson. However, some teachers articulated disengagement was not a problem because

how they managed their class. Teachers revealed a variety of problems with the device

such as breakage and charging; however, it was revealed the district has a loaner program

allowing students always to have a device and students were frequently seen charging

throughout class instruction. In addition, teachers expressed frustration with the

building's Wi-Fi infrastructure; however, they fully admitted that this has vastly

improved since the beginning of the year. Finally, some teachers saw time to implement

the blended learning approach effectively as a constraint. Overall, the participants viewed

time to integrate technology into their teaching had the greatest impact on using the

blended learning approach.

**Moodle as a Tool for Formative Assessment**

To what extent do teachers use Moodle as a tool for formative assessment? If the

participants do not use Moodle as a tool for formative assessment, why is that? For this

study, formative assessment only included electronic quizzes where immediate feedback

would be provided to the students. I found that only a few of the teachers, Bob, John,

Thomas, Kathy, and Georgia used Moodle as a tool for formative assessment. John used

Moodle quizzes during each unit. Figure 2 displays a copy of John's Unit 8 Moodle

page.

*Figure 2*. John's Moodle page. This shows how he uses it as a resource for his students but also to provide formative assessments.
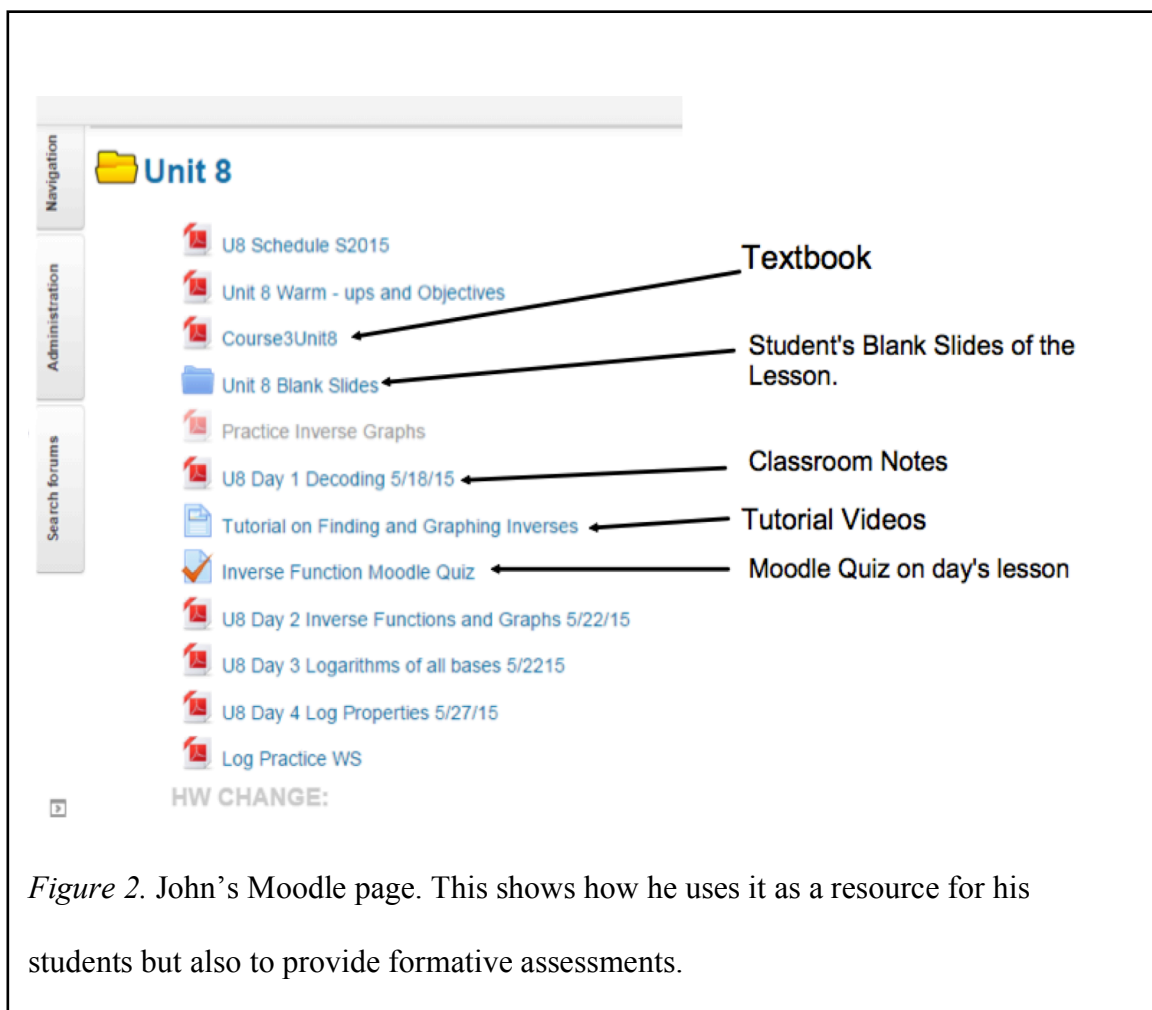
This figure depicts how John used his Moodle page as a resource for providing access to the textbook, class notes, tutorial video, and the quiz. During the interview, I asked John about how he used the Moodle quizzes to inform his instruction. The Moodle quiz was required to be completed the night after the lesson but before students began their homework allowing for them to self-regulate and refresh themselves on the day's

lesson. In addition, John had videos, shown in Figure 3, that he had created that went over the more challenging concepts.



## Tutorial on Finding and Graphing Inverses

Video should be watch after #6 in the investigation.

Creating and Graphing Inverses

e. if n(x) = 2X+1 / 3X-1
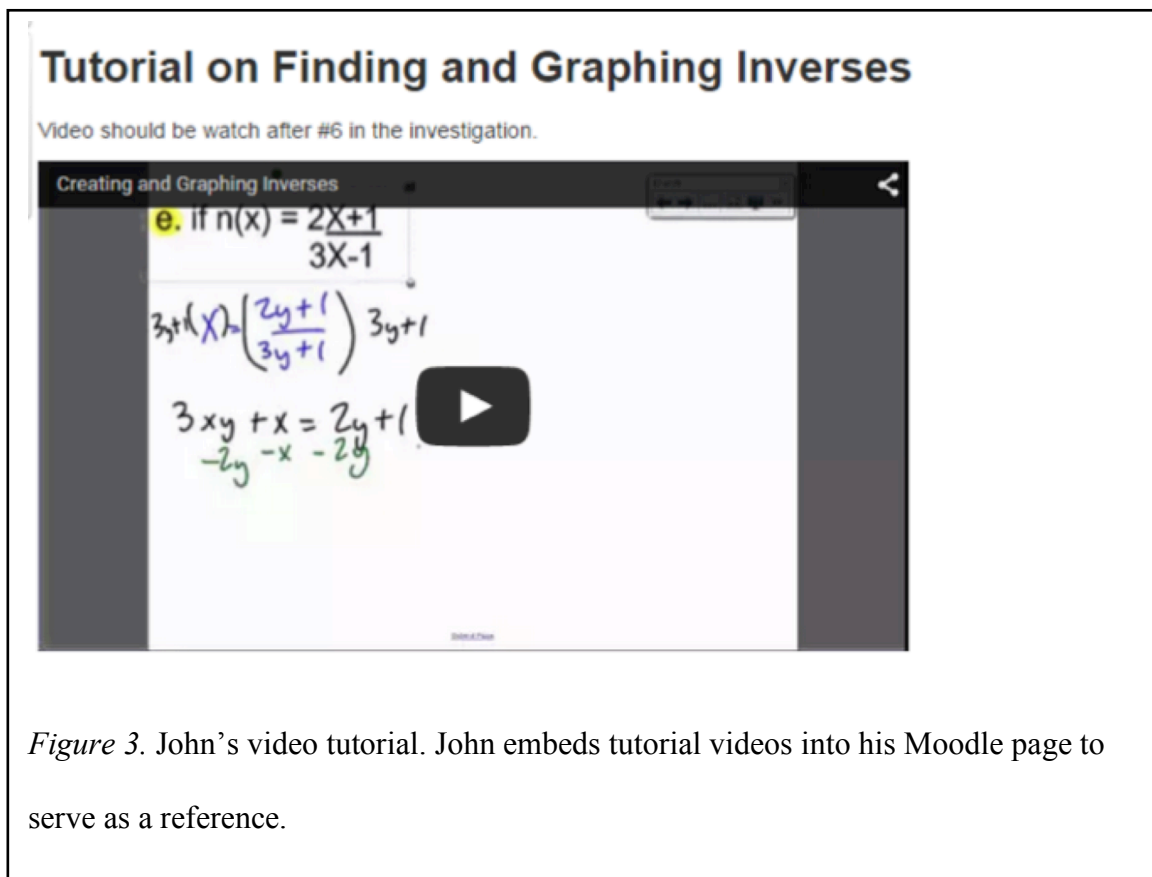
*Figure 3.* John's video tutorial. John embeds tutorial videos into his Moodle page to serve as a reference.

John embedded these videos into his Moodle page allowing students to reference the information and prepare for upcoming assessments. He believed in making his videos because the students know the video fits with the exact concept covered in class and "then the students don't have to search YouTube and have questionable ads pop up." John commented about how he used the Moodle quizzes and the videos.

> If there was a bad quiz one, it might necessitate another video or lecture,
>
> something they can reference. Our homework system is a little odd

because we assign 2 days out. So they get it that night, practice it, ask

questions on the next day, and turn it in. Whereas, the Moodle quiz will

be 1 night. So it is a little more forced, to say we learned this today. This

is what you need to know by tomorrow. . . . So for the daily stuff helps for

the Moodle quizzes, just one or two questions, and the homework goes a

lot easier. Rather than, back loading it I guess, getting all these

assignments on top of each other.

This screen shot of John's Moodle page depicted how a course can be organized on

Moodle. His comments expound on how he used Moodle quizzes for students to self-

regulate but also for him to understand what direction his instruction should take the next

day.

Thomas disclosed that he had the students complete most of the assessments

online, both formative and summative; however, he used other software besides Moodle

to gather data on student understanding. Figure 4 represents a Moodle quiz designed by

Thomas. Online software that he and several others used for formative assessment was

Kahoot, which is a competitive, game-based learning platform that allows teachers to

create their timed questions. He stated, "I do a lot of formative assessments with Kahoot.

We do a couple with Moodle." When it came to summative assessments, he remarked, "I

have to have the summative assessment on Moodle to align with the A+ certification for

the course."
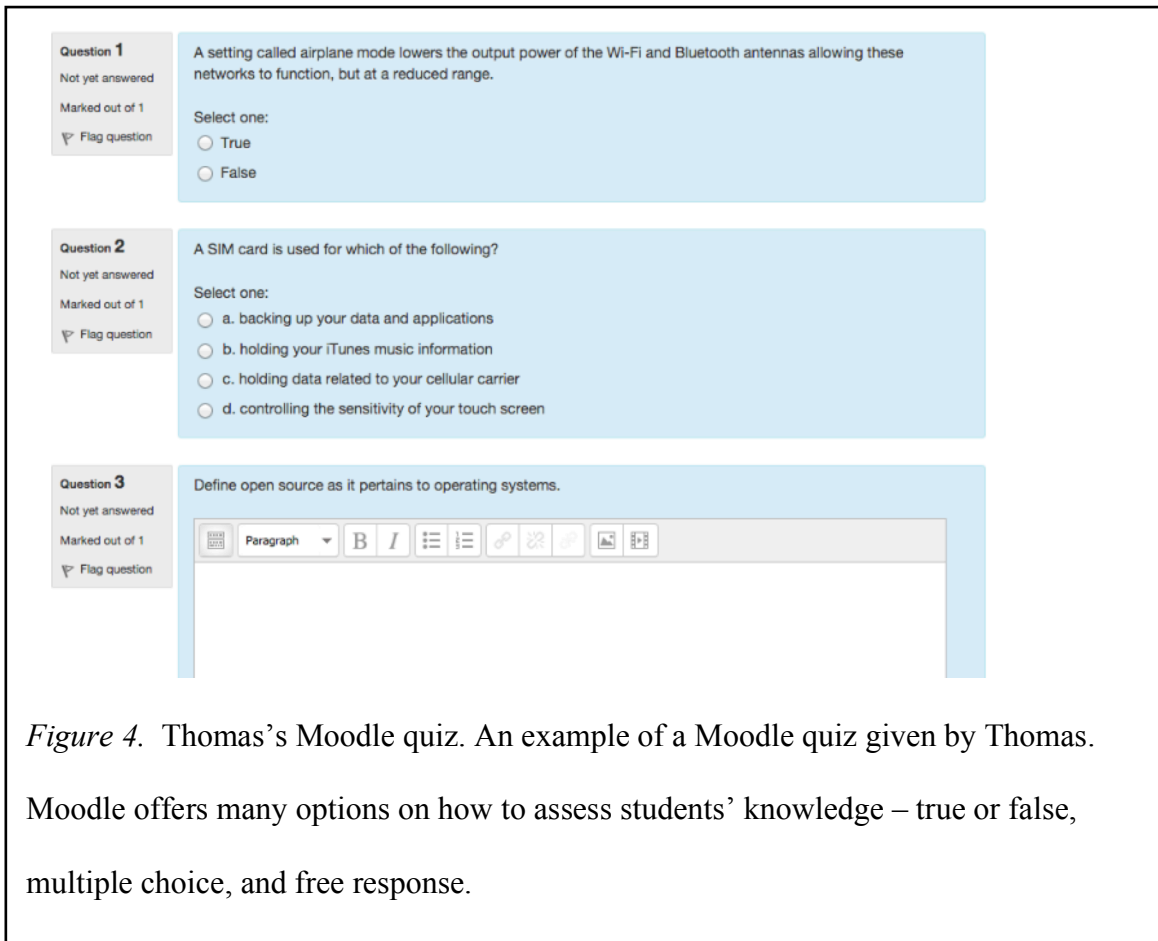
*Figure 4.* Thomas's Moodle quiz. An example of a Moodle quiz given by Thomas. Moodle offers many options on how to assess students' knowledge – true or false, multiple choice, and free response.

Similar to Thomas, Deirdre used Moodle to generate and store quizzes, but she also used Kahoot. Deirdre, a teacher who said she valued providing individual attention, used Moodle quizzes as shown in Figure 5; however, she fully admitted that her Moodle page serves more a resource for the students. The practice quizzes found on her Moodle page allow the students to self-regulate and prepare for upcoming summative assessments.

*Figure 5.* Deirdre's Moodle page. This served as a place to for students to access

resources as well as announcements and practice quizzes.

Similar to Deirdre, Molly used Moodle to store her class resources, but she hasn't

ever used Moodle's assessment functions. She understood the numerous features on how

Moodle's assessment features could be helpful. She admitted,

I did training on it [Moodle], and I really want to use it because I think the

feature that I like the most about it is that it really helps for the kids that

take a quiz or a test late, not on a date that you really want them to. You

can punch in let's say you have a quiz you want to give with ten questions

> on it. . . . You can put 20 questions in and ask Moodle to randomly pick
>
> ten. . . . It might not ask every single kid the same exact questions, which
>
> helps with cheating.

While Molly has the intention of using Moodle for formative assessments, she was observed using the software Kahoot, another web-based formative assessment tool, to prepare students for an upcoming unit test.

Kathy, the teacher who had a flipped classroom, utilized Moodle along with a variety of other tools for formative assessment. In fact, Kathy relied heavily on technology for her assessments. During the interview, she discussed what tools she used and how she kept track of the various students' scores in her electronic gradebook.

> Formative assessment - so, Moodle quizzes are the quick one, and I use
>
> [them] for vocab and quick grammar check-ins. Um, I use Quizlet for
>
> you know; that is another grammar thing. I use a lot of eBackpack for
>
> quick writing samples or audio samples as well. Um, those are probably
>
> my main ones. In my gradebook, I have everything labeled by M for
>
> Moodle or eB for eBackpack, so they know where it comes from or where
>
> to find it.

Kathy felt the district had provided and paid for many e-assessment tools as well as provided excellent PD. These have allowed her to use a variety of tools to assess student understanding.

Several of the teachers commented how they do not use Moodle for assessment purposes. Malcolm did not use technology for assessment purposes because he did not

quiz or test his students; instead, he believed in project-based learning. Lynn did not use Moodle at all. She commented, "Moodle is not user-friendly. It is too clunky and outdated." Similar to Lynn, Jimmy did not use Moodle frequently.

Jimmy, the seasoned teacher, did not use Moodle for assessment purposes. In fact, he did not use Moodle regularly. On his questionnaire, he wrote,

I do not use Moodle too much. I use it like a filing cabinet that students can access as a repository for handouts that were given out in class. I do have answer keys for each unit's review packet on Moodle. I also have a few extra credit assignments and a virtual learning day assignment posted to my Moodle site, but most students do not need to access my Moodle site very often.

His underuse of the Moodle was not because of the lack of PD. According to Jimmy, the district has offered a tremendous amount of opportunities. Jimmy remarked in the questionnaire that

We have excellent professional development (PD) opportunities in the area of using technology in the classroom. Colleagues who use a certain technology in their classrooms are encouraged to teach a PD course. Our technology staff at the high school is knowledgeable and helpful. Strong support is the main factor in why our district has had success in implementing technology in the classroom.

So why did Jimmy not use Moodle or other technology tools for assessment purposes? He confessed that he used his SMART board to present his questions, but he had the

students engage in small group discussions to flush out the answers.  In the interview, he stated, "They talk in pairs or groups of three or something like that, and then we talk as a class then of what the answer is and why.  And, I find that they are really engaged in those conversations." Like Jimmy, Brandon pointed out the training sessions offered by the district.

Brandon, the teacher who struggled to integrate technology, commented about the summer workshops that the district offers.  "We do a Summer Tech Institute in [name of district], and I've attended a few of those sessions, mostly when the iPad was firstly rolling out.  I wanted to learn how to use Explain Everything and Notability."  Everyone agreed the district had offered a variety of different PD courses with an emphasis on integrating technology the past few years.

Malcolm also shared these same sentiments about the Summer Tech Institute. During the interview, he shared more about the details on the classes, when they were offered, and how the teachers were notified.

> There are so many opportunities for classes.  They do 2 weeks in the
> summer.  One right after school ends at least they used to and one right
> before school starts in August.  Um, it's just ongoing.  We get emails
> about classes that have been added, whether they are in the media center
> or at a different school.

He has attended many summer sessions and loves the amount of sharing that occurs.

> And the nice things about the summer classes, I guess all of them, but the
> summer [sessions] are more heavily attended.  You'll have co-workers in

there that you can sit next to and compare notes and talk about similar

things you are going through.  They are really good at, not only instructing

you but also giving you work time afterward.  So you get coaching one-

on-one time, and we get credit for those hours.  So, it is fantastic.

All the participants shared this sentiment of adequate PD.  The summer classes

introduced new software at various levels – beginning, intermediate, and advanced along

with one-on-one assistance to apply the skills to their content area.  When I asked Bob if

the district offered enough PD, he professed,

Absolutely.  This district does a nice job at rolling out [professional

development].  "Hey, we are going to have an eBackpack lesson" or "Hey,

in one of our professional development lessons we are going to roll

assessment into a lesson plan.  So bring a lesson plan that you can work on

to try and roll out a different way to assess students with a different

software."

Overall, each of the participants felt the district does a phenomenal job at providing PD

classes along with providing support to the teachers.  However, Lynn commented, "It is

up to them to take it," referring to the various PD sessions the district offers.

Support during the day was also seen as exceptional.  Georgia, along with many

others, revealed how helpful the media specialists are in the building.  She stated,

She'll offer one-on-one during our preps.  Sometimes I just do a drive-by.

Do you have 5 minutes?  Can I ask you about this? I think there is a lot of

support.  That is something else I want the district to know - is the tech

support is essential.

I asked her if the support was there for all of the teachers, and she said that it was always there and to "keep maintaining those opportunities" for the staff.

While the PD opportunities and tech support were recognized as exceptional, the participants confessed they did not know what other departments were doing to implement technology.  When I asked Jacob if he felt there was enough teacher sharing and how he integrated technology into the curriculum, he responded, "As far as department to department, I could probably name five teachers outside of the science department."  Jimmy had a similar answer and revealed the science department is one of the biggest, and "We don't even get together as a department."  Kathy shared her understandings on interdepartmental communication.  While she loved working for the district because of highly educated teachers who are working to assist students, she professed that sharing occurred more informally in casual conversations or at the summer workshops.

In synopsis, five of the 12 teachers used Moodle as a tool for formative assessment; however, nine of the teachers used other Web tools for e-assessments.  These tools provided immediate feedback and allowed students to self-regulate.  Teachers also communicated that the district offered a tremendous amount of PD, but the teachers did little to no sharing or collaboration across departments.  Furthermore, it was observed that each department used different technology tools to assist students in their learning.

**Using Blended Learning to Assist Students**

How did teachers use blended learning to assist students in the learning process? One major theme that emerged from the data were that technology serves as an easy tool for formative assessment and providing feedback. Another focused on how blended learning also promoted sharing, research, project-based learning, and the ease of taking notes without losing them.

In addition to the tools that were discussed earlier, some teachers utilized software called Turning Point, which was also known as Responseware by the faculty to promote self-regulation. It was a simple polling interface that provides both the teacher and the students an ID code for entering the session. During Bob's observations, he had the students regularly using this technology. He asked the students questions where he provided choices. For example: 1 for yes, 2 for no, or 3 for I do not know. He also used the tool for students to enter their homework answers or scores freely. When I inquired about this tool during our interview, he responded by saying,

> I never have to ask a question that requires a kid to raise their hand in my
>
> class anymore. I want all my kids to participate. Um, I can ask questions
>
> on the fly. I can be more creative. "Hey answer this." I'll just whip up
>
> my answers. "So, what is this? What does it mean to take the absolute
>
> value of [a number]?"

Turning Point software allowed all of the students to participate actively in a nonjudgmental, anonymous manner, but it also allowed the teacher to ask questions impulsively when he or she may question students' understanding.

Students conducting research using their device can also receive immediate information. Jimmy discussed how things had changed for him now that the students have the iPads. He said,

> The kids are inclined to do that type of research. . . . There were many
> times in the past, before this year, um, where a kid would ask me some
> really advanced question, way beyond the scope of the course. And, I
> would have to be okay with saying, "Yea, I don't know. I will see if I can
> find out for you. Why don't you see if you can find out too?" This year,
> now they all have iPads, and I can say that immediately and within 90
> seconds they will have the answer because they can get immediate
> answers or feedback to their questions.

Using their device to research or share was important to all of the participants. Lynn commented how "blended learning assists me in increasing the intrinsic motivational factor for students by giving them outside motivators. Students are more comfortable and willing to share their answers/work. Technology gives them the motivation to do well, and it keeps them engaged." Lynn's response was similar to Molly's.

Molly had similar thoughts on the importance of using their device for research. She commented, "that students are learning for themselves" when they are researching. Teachers felt having quick access to information allows for deeper, more relevant discussions that are student-centered.

Jimmy has also found the iPad's camera assisted in the learning process. During the interview with Jimmy, he revealed how he has the students used the iPads' cameras to add photographic evidence in their lab reports.

For example, my students in the lab always did a lab notebook, and they would draw pictures and put words underneath. But now with technology, they can take their high 'res' cameras that they have on the iPads and take pictures and make the same kind of lab reports. But, the technology piece is really a hook, I think. Kids like using it. They're good at using it. They pick it up very quickly, and they can put together lab report with this technology that just looks phenomenal. So, the finished product is better.

Jimmy had the students use their iPads to take photos during their labs to provide evidence of what occurred during the experiment. Figure 6 provides an example of a student report. The student must include photos and written descriptions of what occurred in the lab report.

**Procedure:**

1. Measure out 4.00 g $NaOH_{(s)}$ and 200.0 mL tap water. Put one coffee cup inside the other for insulation. Measure the initial temperature of the water.

2. Rxn 1: $NaOH_{(s)} \rightarrow Na^+_{(aq)} + Cl^-_{(aq)}$
Add 4.00 g $NaOH_{(s)}$ to 200.0 mL of tap water. Swirl periodically.

3. Record the highest reported temperature. Check to make sure all of the $NaOH_{(s)}$ has dissolved.

4. Wash out the cups. Measure out 4.00 g of $NaOH_{(s)}$ and 200.0 mL of 0.500 mol $HCl$. Take the initial temperature of the $HCl_{(aq)}$.

*Figure 6.* Example of a lab report completed by Jimmy's student. Jimmy required students to use their digitial camera to provide photographic evidence of various steps in a lab report.

In the majority of the observations, teachers were asking students to take a resource or document from their Moodle page or eBackpack and download it into Notability. Students handled this maneuver with ease, and not once did I observe students having any problems with this procedure. When I asked Thomas about this skill set of maneuvering from tool to tool, he discussed how the students experience

…exposure to multiple different platforms, multiple different apps. It kind of ties in with the multi-tasking piece that I was trying to get at, but they are using a variety of different tools. And they are super comfortable in

jumping from Moodle to Google. You know, and then they go to LabSim,

and they use an app like ThingLink. There is no hesitation there. They

are so used to doing it, and they will have their phones out. Um, I think

that is a valuable skill for them.

The simplicity of students using multiple platforms was important to several participants. They felt this was a life skill that will help students in their futures.

To recap, blended learning assisted the students by providing immediate feedback via e-assessments and promoted project-based learning. In addition, the tool was considered an informative tool for researching and enriching learning as well as fostering collaboration and sharing. Besides using Web 2.0 tools to assist the students in their learning, various software tools assisted teachers in their instruction.

**Web 2.0 Tools That Assist Teachers**

The faculty shared a vast variety of Web 2.0 tools that they found beneficial to teaching and learning. Table 2 reflects some of the software or Web 2.0 tools the 12 participants used during the observations, communicated in the questionnaire, or shared during the interview. This list is in no particular order, but these platforms were recognized as important or user-friendly tools to integrate technology. However, participants appear or did not comment about tools that could be used to communicate or collaborate online, such as a blog or wiki. Furthermore, the teachers seemingly focused on their use of Notability and eBackpack during their interviews, making it appear that there is not a lot of diversity in their use of other tools.

Table 2

*Software or Web 2.0 Tools Used by Participants*

| | |
|---|---|
| Moodle | iMovies |
| Notability | Pinterest |
| Google Tools | eBackpack |
| Turnitin | Turning Point |
| Apple TV | YouTube |
| Twitter | Ted Talks |
| Haiku Deck | Readability |
| Flipnote | Skype |
| Web Conferencing | iBooks |
| Kahoot | Geogebra |
| SMART | Prezi |
| Explain Everything | VoiceThread |
| Test Out LabSim | Vimeo |
| ThingLink | Sony Soloist |
| Socrative | |

In reference to Research Question 5, 'How do these Web 2.0 tools assist teachers with blended learning?' the questionnaire data indicated that the most commonly viewed Web tools being used were Moodle, eBackpack, and Notability.  Lynn reported on the questionnaire, "I use eBackpack and Notability daily in my teaching practice.  Students will often have worksheets they need to pull from eBackpack into Notability to complete on their iPads."  Jacob believed this method of sharing via Moodle or eBackpack into Notability cut down on his prep time significantly because he no longer needed to make paper copies of all his students' assignments.

Deirdre used Moodle, eBackpack, Turnitin, and Google Tools as her primary technology tools.  On her questionnaire, she documented how she uses these tools.

> eBackpack and Turnitin provide me with the opportunity to collect
> student work, provide feedback, and return work to students electronically.
> Additionally, these features allow me continuous access to previous
> student work. In other words, once I have provided feedback using these
> tools, both the students and I have access to their work. These technology
> applications further save me time. I do not need to give students graded
> assignments during class time. Instead, students simply log into their
> accounts and read the provided feedback.

Deirdre also commented on a feature of eBackpack that she loved.  "I love it because it links to Skyward.  So, anytime I enter a grade then I can import any of that to Skyward."  Skyward was their grading system.  This link saved the teachers from completing an extra step, which saves them time.

Jimmy also liked eBackpack but for different reasons. Jimmy shared during the interview how he used the microphone function making his job easier and more personalized.

> That microphone function in eBackpack is genius too. I use that a lot. And doesn't save me any time; I thought that it would. But the feedback that the kid gets back from the teacher is so much, so much better than just typing out a response. Because you know as a teacher, when you read 50 lab reports in a sitting, and they all are doing significant figures wrong, you start out going, if you are typing it, you realize okay so your three significant numbers in your measurement means that you are in the hundreds place, that also means that your uncertainty in your guess place in your uncertainty also needs to be hundreds place. You type that out 10 to 15 times, then all of a sudden after you type that out 30 times, it just becomes 'sig. figs'! . . . . And it is much better feedback, even though it takes about the same amount of time. So, the microphone function is something that I use a lot in responses to their lab reports.

The microphone feature of eBackpack allowed teachers to record whatever type of feedback they wanted to provide for each student. However, the teacher was unable to determine if the student ever listened to the message. Jimmy felt that it was a feature that he relies upon as the instructor.

Kahoot was another Web tool that allowed teachers and students to check for understanding. Jacob explained why he loved Kahoot.

I love Kahoot for multiple reasons.  One, students like when you turn

anything into a game.  So again, it is incorporating their interests with the

learning aspect of it.  Um, it really helps get students engaged.

Kahoot was seen being implemented by several teachers.  In an English class, Deirdre

and Molly used it to review prior to a test.  While most of the students used their iPads;

two students did not have theirs, so they were used their phones to access the site.

Students signed into the session and typed their player name.  Each question was limited

in time, 20 seconds, as there was fun music playing.  For each question, students were

provided several options with only one being the correct answer.  Students were

thoroughly engaged in the activity.  After time was up, and each question was closed, the

software provided the number of students who answered the question accurately as well

as the number who got it wrong.  In addition, Kahoot kept track of student performance

by awarding points to students based on accuracy and time. A running record of the

leader board was displayed after each answer.  The teacher went over the correct

response by asking the students to explain why the others were not acceptable choices.

Generally, I understood why students would be engaged and enjoy this activity.  It was

competitive, quick, and plays fun music.

Overall, the 12 participants perceived blended learning engaged students in a fun,

yet thought-provoking, approach to teaching and learning.  Various technology tools

allowed for teaching to be individualized, student-centered, and provide real-world

relevance.  It assisted both the teacher and student with organization and was a useful tool

for formative assessment, which delivered immediate feedback and can evoke self-

regulation.  Still, teachers seemed focused on particular tools, like Notability and eBackpack, making it appear that there is not a lot of diversity in their use of other tools.

While there were a great many perceived successes, the teachers also acknowledged the challenges to the blended learning approach.  Students used the device to disengage in the learning process, and the device itself appeared to be challenging. Teachers noted issues like cracked screens, charging, and downloading of inappropriate apps impacted teaching and learning.  Furthermore, concerns about the building's infrastructure, while showing improvements, were acknowledged.  The participants recognized and appreciated the various PD sessions the district offers along with the superior tech support.  However, the participants admitted there was not an established learning community where a culture of sharing was occurring from department to department to improve teacher pedagogy.

## Summary of Findings and Conclusions

Through the examination of the data, teachers revealed that blended learning shifts the instructional approach from teacher-centered to student-centered allowing students to engage and collaborate in the learning process.  This approach also permitted teachers to individualize student learning and provide real-world relevance.  While the participants revealed that only five of them used Moodle for e-assessments, nine of the teachers used other Web tools for e-assessments.  The teachers conveyed how e-assessments provided immediate feedback and assisted students in self-regulation.  There were a great many Web tools that were revealed to assist students and teachers.  These

tools helped with organization, engagement, and individualization.  While the teachers articulated many benefits, they disclosed many challenges as well.

There were several challenges that were revealed.  Teachers were frustrated that students used their device to disengage because they were visiting game sites versus engaged in the lesson.  Teachers also commented about problems with the device such as breakage and charging.  In addition, teachers expressed frustration with the building's Wi-Fi infrastructure. Finally, some teachers saw time to implement the blended learning approach effectively as a constraint. Overall, the participants viewed time to integrate technology into their teaching had the greatest impact on using the blended learning approach.

Teachers also revealed that there is not a formal opportunity for sharing how they integrate technology or utilize various Web tools.  Blended learning requires a commitment of time for faculty to collaborate and share.  For teachers to be successful, they must be afforded the time to collaborate, practice and learn, as well as reflect on how technology impacts teaching and student learning (Buckenmeyer, 2010; Prytula & Weiman, 2012).  The major theme discovered that would support teachers as they make this shift to 21st century teaching is time for teachers to collaborate and learn from each other.  Several of the teachers, like Jimmy and Brandon, wanted to incorporate more technology into their teaching, but they struggle to use it thoughtfully or to stay one step ahead.  Furthermore, while all agreed the district did a superb job at offering PD, there was not a system in place for on-the-job sharing, especially across departments.  The lack of on-the-job sharing was further supported in the data, which showed departments using

or underusing various Web 2.0 tools, like formative e-assessments. Some teachers

remarked about the need for time to collaborate and share ideas to successfully execute

the technology integration into their lesson plans.

In closing, teachers perceived that the blended learning approach influenced

teaching and learning by assisting students in 21st century communication and

collaboration, as well as engaging the learners to promote real-world relevance. The use

of technology also allowed teachers to individualize their instruction and create a student-

centered environment. Teachers used a variety of e-assessments, including Moodle,

allowing students to self-regulate after receiving immediate feedback. Furthermore,

teachers found the LMS promoted organization and served as a useful tool to deliver

information. However, several challenges emerged as well. Students were seen

disengaging in the learning process as they visited gaming sites. In addition, teachers

commented on the challenges of broken devices, the need for students to charge their

device, and the occasional infrastructure problem with intermittent Wi-Fi. Finally,

teachers revealed that while the district offers a lot of PD, the district does not afford the

time for cross-divisional teachers to collaborate and share on how they integrate the

device into their daily practice and lesson plans. Teachers responded they would like time

to collaborate and share. To promote the widespread use of the device, teachers can

share how they use the device for individualization, such as project-based learning, a tool

for e-assessment, as well as how to create a more student-centered environment.

A professional learning community (PLC) would foster adult collaboration and

sharing to improve instructional practices. A PLC would also promote the widespread

integration of technology and encourage the utilization of various Web tools.

Furthermore, a PLC could address the district's problem of students may not be receiving

a personalized educational experience or increased 21$^{st}$ century skills because some

teachers may not be using of may be underusing the technologies and the LMS.

## Conclusion

This study explored how teachers, who were the early adopters of the blended

learning approach, perceived it influenced their teaching practices and assisted students in

the learning process. As a part of this research purpose, this project study explored

teacher perceptions about the successes and challenges of blended learning, including

how Moodle was used as a tool for formative e-assessment. The study also investigated

how Web 2.0 tools assisted teachers with blended learning. To accomplish this study, a

qualitative case study was conducted.

At a Minnesota high school, 12 teacher participants were intentionally selected

based on their use of Web 2.0 technologies and Moodle. Since I do not work for the

district and have no pre-established relationship with any of the educators, a gatekeeper

was used. The gatekeeper assisted in selecting potential participants. Participants were

ensured their rights via a written consent form. Any and all information generated from

the study was securely stored in a password protected computer or a locked cabinet.

Data were collected using a questionnaire, observations, and documents in the

form of teacher screenshots, along with subsequent interviews. All data were collected

and analyzed simultaneously to generate potential themes. Using the four different types

of data, I established validity and reliability through triangulation, by seeking discrepant cases, and through member checks.

The findings revealed by the 12 participants are that blended learning engages students in the learning process and that various Web 2.0 tools allow for teaching to be individualized, student-centered as well as provide real-world relevance. Technology assisted both the teacher and student with organization and was a useful tool for formative assessment, which delivered immediate feedback fostering self-regulation. While there are numerous apparent successes, the teachers also acknowledged the challenges to the blended learning approach. Students used their iPads to disengage in the learning process, and the device itself appeared to be challenging. Teachers mentioned issues like cracked screens, charging, and downloading of inappropriate apps impacted teaching and learning. Furthermore, concerns about the building's infrastructure were acknowledged; however, the district, teachers, or students have been working on addressing all those issues. The participants recognized and appreciated the various PD sessions the district offers, but the participants admitted there is not interdepartmental sharing. The findings disclosed that with time and meaningful collaborative learning teachers would be more inclined to implement the blended learning approach.

Section 3: The Project

**Introduction**

Based on further exploration of recent literature, the results of the study, and district leader's desire to personalize education as well as prepare students for the ever-changing global society, plans for a yearlong PLC was created allowing for teachers to collaborate, share, and support one another. In this section, I reveal the purpose for the PLC, which is to improve teachers' technology integration and instructional practices. In addition, the goal for the PLC is disclosed, indicating that all high school courses will implement various technology tools, which encourages e-assessments, project-based learning, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year. To meet this goal, four specific performance objectives were designed. The rationale for selecting a PLC is disclosed and followed by a second literature review. In this section, I present the suggested implementation of the project consisting of monthly small group sessions. These sessions are designed to increase the knowledge of the high school teachers so they more effectively implement the blended learning approach using tools like e-assessments, project-based learning, and communication tools such as blogs. Resources, necessary supports, potential barriers, and solutions are presented. Subsequently, the project evaluation plan, which is both formative and summative, is explained, and the project's implications are discussed. To understand the implications of the PLC, specific, measurable goals are outlined and described.

**Description and Goals**

This study's findings suggested that to assist teachers in using the blended learning approach as well as assimilating higher levels of technology integration, teachers would benefit from a PLC. The specific goal for the PLC is that all high school courses will implement various technology tools, which encourages e-assessments, project-based learning, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year. After reviewing the data, teachers revealed that the integration of technology created a student-centered environment that encouraged 21$^{st}$ century skills like enhanced communication, collaboration, and organizational skills as well as promoted real-world skills for college or careers. Furthermore, Web tools allowed teachers to provide immediate feedback through e-assessments and engaged students in their learning. However, teachers revealed several challenges like disengagement, device concerns of charging and breakage, along with intermittent Wi-Fi. Moreover, teachers remarked how the district offers a lot of PD, but teachers are still struggling with making the integration of technology relevant to their lessons as well as using a variety of Web tools to effectively integrate the device into their daily practice and curriculum.

One proposed way to increase teacher knowledge and the utilization of technology is to create a PLC to enhance teacher and school capacity. PLCs can promote the widespread integration of technology allowing for more students to benefit from the blended learning approach (Hilliard & Newsome, 2013; Kenney, Banerjee, & Newcombe, 2010). A PLC enables teachers to feel more comfortable in the utilization of

various Web tools. Overall, the purpose for the PLC is to improve technology integration and instructional practices, which leads to improved student achievement (Saritepeci & Çakir, 2015). The specific goal for the PLC is that all high school courses will implement various technology tools, which encourages e-assessments, project-based learning, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year. To meet this goal, specific performance objectives were designed. Objective 1: In the fall of 2016, all teachers will assemble monthly in their PLC group to work interdepartmentally on integrating technology; Objective 2: Each month, teachers will collaborate, share, and apply various Web tools into their curriculum that encourage individualization, communication, collaboration, and creativity; Objective 3: After each PLC meeting, teachers will complete a short survey to evaluate the effectiveness of their PLC; Objective 4: In the fall of 2016 and the spring of 2017, the district will distribute a technology integration survey to faculty to determine how the integration of technology has impacted teaching and learning including the potential change in practice.

The findings and conclusions of Section 2 support this goal and objectives. Web tools allow for teaching to be individualized, student-centered as well as provide real-world relevance. Technology assisted both the teachers and students with organization and was a useful tool for e-assessment, which delivered immediate feedback fostering self-regulation. However, even with the PD the district has offered, some teachers struggle to implement technology into their daily practice. Therefore, a PLC can allocate

the time as well as foster meaningful collaborative learning so teachers are more inclined

to implement the blended learning approach.

### Rationale

The project outcome, in the form of a PLC plan, was chosen based upon the

findings of how teachers perceived technology influenced teaching and learning as well

as what current literature revealed about the benefits of blended learning. During the data

collection, teachers applauded the district's offerings of PD; however, they admitted there

are no formal opportunities where teachers share technology innovations from

department to department. Therefore, the literature will corroborate the study's findings

for the need of a PLC to provide opportunities for sharing, collaborating, and

implementing higher levels of technology integration.

The literature supported this study's findings of the benefits and challenges to the

blended learning approach. Researchers have shown that the implementation of

technology in education encourages individualization and organization and is convenient

and engaging for learners (Handy & Braley, 2012; Poon, 2013). Institutions that

implement the blended learning approach promote the necessary ICT skills for their

students' futures. Moreover, integrating technology directly impacts student learning and

influences student preparedness for the 21st century workforce (Saritepeci & Çakir, 2015;

Van Dam, 2012). Nevertheless, technology is not the answer; it is what teachers do with

it (Roblyer & Doering, 2010). Roblyer and Doering (2010) claimed that "the application

of technology influences performance, not as a delivery system, but as instruction that

works under certain circumstances" (p. 13). Therefore, large school districts, like Los

Angles, New York City, and Oakland, to name a few, are spending millions on implementing the blended learning approach; however, teachers must understand how to leverage technology to personalize the educational experience for students (Douglas & Klein, 2012; iZone, n.d.). The Rogers Family Foundation, who sponsors the Oakland Unified School District, sees their future resources being used to support teachers with training (Douglas & Klein, 2013).

Similarly, this study's district has delivered the hardware to implement the one-to-one approach and the bandwidth to support it as well as offered a multitude of PD opportunities. However, teachers are just growing accustomed to the idea of blended learning, and many see the challenges that go along with these successes. DuFour and Fullan (2013) indicated that connecting educators to create a "shared mindset" could be established through campus-based PLC (p. 23). A PLC can promote the widespread integration of technology, encourage the utilization of various Web tools, and improve instructional practices, which researchers have stated will lead to improved student achievement (Saritepeci & Çakir, 2015). However, teachers need time to learn and share ideas about how to effectively implement these technologies (Buckenmeyer, 2010). Kenney et al. (2010) and Hilliard and Newsome (2013) asserted that PLCs are fundamental for educators to advance their knowledge and skills and, therefore, integrating higher levels of ICT.

Overall, the participants understand the district's goals for using technology; however, the district needs to cultivate a systemic change focused on integrating technology to enhance student learning. Therefore, affording the time for teachers to

collaborate, practice, and learn, as well as reflect on how technology impacts teaching and student learning needs to be advanced.  The results of this project study may provide the framework for developing PLCs to encourage teachers to higher levels of tech integration as well as personalizing learning and enhancing students' 21$^{st}$ century technology skills.

## Review of the Literature

Based on the findings of Section 2, in this second literature review, I further explore recently published literature related to the project outcome of this study.  In this review, I further identify how the literature is compared to the findings to reveal how technology influences teaching and learning, assists students in the learning process, and what challenges teachers face when integrating ICT.  Moreover, the literature revealed how to enhance the capacity of teachers as well as the organization through the creation of PLCs (Cifuentes, Maxwell, & Bulu, 2011; DuFour & Fullan, 2013). To complete the literature review, a search of scholarly, peer-reviewed articles was completed using the Internet and the following databases:  ERIC, EBSCO, ProQuest Central, Education Research Complete, and Thoreau.  The following keywords were used*:  iPads or tablets, blended learning, education, benefits, challenges, charging or batteries, individualized or personalized, paperless, digital literacy, formative assessment or e-assessment, organization, professional learning community, technology integration, teacher change, professional development, staff development,* and *learning communities.*

This literature review is organized according to the findings and relevant research. It is grounded in the social constructivist theory where adults acquire knowledge, skills,

and strategies when working together (Jackson, 2009). The review included the successes and influences of blended learning including student-centered environment, individualization, engagement, and real-world relevance, followed by how technology can be a useful tool for organization. Literature also showed that technology can increase communication and collaboration as well as serve as a useful tool for providing immediate feedback using e-assessments.

The findings of this project study research also revealed challenges with the blended learning approach. Students and teachers saw social media and gaming as a distraction. Also, broken devices, the need for students to charge their device throughout the school day, and the occasional infrastructure problem with intermittent Wi-Fi was viewed as a concern. Finally, teachers confessed that they would like more time to collaborate on how they can effectively integrate the device into their daily practice and curriculum. These findings, as well as the literature, revealed the need for the development of a PLC that focuses on enhancing teacher integration and use of the iPads.

Expanding teachers' pedagogy to advance teaching and learning that embraces technology requires educators to transform their approach from teacher centered to student centered. Based on social constructivism, teachers must work together to explore and create the three frames of knowledge–content knowledge, pedagogy knowledge, and technology knowledge (Koehler, Mishra, & Cain, 2013; Paily, 2013). Integrating technology into teaching is challenging because it requires educators to grow continually in the three frames of knowledge (Koehler et al., 2013). One proposed way to increase teacher knowledge and the utilization of technology was to develop a PLC plan to

enhance teacher and school capacity. PLCs can transform schools from teacher centered

to student-centered organizations by building and sharing knowledge (DuFour, 2012).

Researchers stated that student-centered teaching encourages active learning and that

various Web 2.0 tools offer students a chance to engage in the learning process (Anwar,

2011; Chickering & Ehrmann, 1996; Williams & Chinn, 2009). ICT encourage students

to be active learners by promoting new and effective ways to communicate and

collaborate (DePietro, 2013; García-Valcárcel et al., 2014). To understand the

importance of establishing a PLC, one must understand andragogy or adult learning.

**Theoretical Framework**

Adult learning is framed in the social constructivist theory. Adults learn better

when they are part of a collaborative culture (Killion & Roy, 2009). Andragogy, or adult

learning, arises when schools instill a culture of collaboration and collegiality (Semadeni,

2010). Researchers have indicated that collaboration stimulates the brain allowing for

deeper individual and group learning (Achterman & Loertscher, 2008). According to

Killion & Roy (2009) and Reason (2010), teachers who engage in frequent and

continuous conversations about teaching and learning will create a motivated culture of

shared practice as well as build stronger self-efficacy in the mindset of the teacher.

Collaboration empowers individuals creating a shared purpose and accountability

(Reason, 2010). Furthermore, Reason concluded that collaboration can challenge

inconsistencies, test values, establish accountability, build memories that instill trust, and

reduces isolationism. Therefore, educators should work together to "plan, design,

research, evaluate, and prepare teaching materials together" (Killion & Roy, 2009, p. 39).

With a shared purpose, educators will be motivated as well as have more ownership allowing for the agreed changes to be more accepted and implemented (Waddell & Lee, 2008). For that reason, leaders should create a stimulating environment where teacher can engage in the professional learning process either in small groups or whole group while collaborating with others both inside and outside the classroom (Killion & Roy, 2009). To accomplish a shared purpose, adults must understand why the blended learning approach is important (Guskey, 2014; Knowles, Holton, & Swanson, 2005).

**Influences and Successes of Blended Learning**

The research on blended learning as well as the findings of this study revealed a multitude of ways the blended learning approach positively impacts teaching and learning. In this study, the findings indicated that using technology fostered a student-centered environment that encouraged individualization, increased organization and usefulness, and provided real-world relevance. Teachers also believed it impacted engagement, collaboration, and communication as well as promoted self-regulation and feedback through e-assessments. Teachers used a variety of e-assessments, including Moodle, allowing students to self-regulate after receiving immediate feedback. Technology promotes a student-centered approach that fosters individualization. These findings will be corroborated by the relevant, current literature.

**Student-centered environment and individualization.** Using technology in the K to 12 environment allows teachers to support each student in the learning process (Headden, 2013). Karsenti and Fievez (2013) and Poon (2013) reported that the blended learning approach provided flexibility for students letting them work at their pace.

Students with various learning styles also benefitted from the blended learning approach (Poon, 2013). Headden (2013) wrote how technology can replace the tedious task of grading assessments, allowing teachers to spend more time on guiding, inspiring, and individualizing the curriculum. Kathy, who stated how she used technology "to provide different learning opportunities for similar learning targets," also expressed this sentiment. Additionally, Headden stated that when students are working on a device, they may work on their task, and teachers and students can monitor their progress. The concept of individualization and self-regulation was revealed in this researcher's findings. Kathy commented how she posted assignments and quizzes for students to complete at their pace. She was observed assisting students in their learning versus leading the class. Furthermore, she believed that e-assessments allowed students to self-regulate.

Teachers, like Georgia, also perceived that blended learning moved from a teacher centered to a student-centered approach. Georgia felt that technology allowed her to put the responsibility of learning on her students. Similar results were found in a study conducted by Ignatova, Dagienė, and Kubilinskienė (2015) where they interviewed 105 Lithuanian teachers to explore their perceptions about technology-based teaching and learning. It was determined that the teachers' role shifts from teacher-centered to student-centered allowing teachers to facilitate the learning process (Ignatova et al., 2015). The student-centered approach allowed for the personalization of teaching and learning (Ignatova et al., 2015). All 12 participants in my study expressed that the blended learning approach was conducive for individualization. Thomas remarked,

"Blended learning has greatly allowed for the personalization of learning in my classes. I provide them the open-ended assignments allowing them to choose the technology they prefer." However, Ignatova et al. purported that teachers must be motivated to create this type of learning environment.

**Engagement and real-world relevance.** Participants shared that technology can engage students in the learning process. Saritepeci and Çakir (2015) conducted an experimental study to analyze the effects of blended learning on middle school student's engagement and achievement. The data analyzed academic achievement tests as well as used an engagement scale with the 107 participants (Saritepeci & Çakir, 2015). The blended learning experimental group used a mobile device along with the LMS Moodle for 6 weeks in a 7th-grade social studies course (Saritepeci & Çakir, 2015). In a pretest, posttest comparison, the results showed the experimental group's results were significantly higher for achievement than the control group; however, there appeared to be no significant increase in engagement (Saritepeci & Çakir, 2015). While this researcher's study did not examine achievement results, teachers believed student engagement increased. Moreover, the district has moved towards the blended learning approach to increase student achievement. Therefore, according to this research, with the proper integration of the blended learning approach into a quality curriculum, positive effects on learning can occur (Saritepeci & Çakir, 2015).

Researchers Handy and Braley's (2012) revealed that teachers' viewed the blended approach affected teaching and learning by engaging the learners in a more individualized skill-based research that is necessary for college. However, these

researchers (Handy & Braley, 2012) commented about the complexities of implementing this approach and recognized the importance of teachers working collegially with others to integrate. This idea again corroborates this study's findings. Teachers, like Jimmy and Brandon, wanted to incorporate more technology, but procuring the time to share and use it in a thoughtful manner appeared to be a challenge.

The literature showed the importance of developing the necessary ICT skills to succeed in postgraduate careers. Hall, Nix, and Baker (2013) conducted a mixed methods study to determine the various effects digital literacy has on future employment. Over 90% of the participants viewed ICT skills as necessary in the job market (Hall, Nix, & Baker, 2013). These researchers suggested that educational institutes develop these digital skills in the context of subject matter because of motivational factors, and it provides equality for the disadvantaged demographic students (Hall et al., 2013). Likewise, Shailaja and Sridaran (2015) remarked about the importance of computational thinking of the K to12 students commenting about how these digital skills play a role in shaping their career. Similarly, having 21$^{st}$ century was important to this study's leaders and its teachers. Malcolm, Kathy, Georgia, Thomas, and Deirdre specifically recognized the importance of integrating technology because of students' future careers and the globalization of the world.

The globalization of the Internet along with affordable, portable devices has brought forth an era in education where learning is no longer passive (Delialioglu, 2012; Jacobs, 2010). Students are actively involved in what and how they learn (Bassendowski & Petrucka, 2013). Supported by the constructivist and connectivism theories,

technology allows students to explore new ideas and transform their learning using 21st century Web tools (Bassendowski & Petrucka, 2013). Van Dam (2012) discussed how emerging technologies are shaping the way people learn. Van Dam cited that 90% of on-the-job learning occurred from social learning, on-demand learning, like podcasts and webinars, as well as career learning. Web tools are delivering this learning. Also, Web tools are assisting districts to move toward a paperless classroom, which supports students in their organizational skills.

**Organization and usefulness.** The findings of my study also revealed that technology assisted students in their organization and the general of being semipaperless. Lynn, Jacob, and Deirdre discussed how various Web tools cut down on their time because assignments were passed out and turned in electronically. In a study by Wang and College (2010), being paperless was highly motivating for students and allowed them to study whenever and wherever. De Bonis and De Bonis (2011) found that an LMS could greatly facilitate the delivery and managing a paperless environment. Paperless classrooms, according to De Bonis and De Bonis, improved the efficiency of teaching and provided the skills for postgraduate careers.

In a study conducted by Emelyanova and Voronina (2014), these researchers determined a LMS was perceived to be useful and convenient by half of the student and teacher participants. Participants found the LMS was useful as a storage area for course materials (Emelyanova & Voronina, 2014). Emelyanova and Voronina believed that the commitment of teachers to engage in the e-learning mindset could impact students'

appreciation and use of a LMS.  Besides enhancing organizational skills, Web tools foster communication and collaboration.

**Communication and collaboration.**  Various Web tools also allow students to communicate and collaborate.  A study was conducted by Gecer (2013) to determine students' opinions about the communication process in a blended learning environment.  While students had more positive feelings about communicating in this type of environment, they conveyed the importance of face-to-face instruction and communication (Gecer, 2013).  However, overall students were quite satisfied with the blended learning environment (Gecer, 2013).  Likewise, a study led by Florian and Zimmerman (2015) determined that for students to be prepared for global competitiveness, secondary schools need to incorporate the 4 C's in their curriculum–"communication, collaboration, creativity, and ability to connect one learning opportunity to another" (p. 103).  This sentiment was cited in my study showing web tools fostered collaboration.

Grounded in the research by Florian and Zimmerman (2015) as well as Downing et al. (2014), teachers in my study disclosed they utilized a variety of Web tools, which they perceived assisted students in the learning process.  In Malcolm's class, students were seen collaborating to create an iMovie documentary.  This project-based learning required students to communicate effectively with staff members and collaborate each other.  Furthermore, Klovalik et al. (2014) reported how students were excited and motivated to create JING videos.  While different software was used, Klovalik et al.'s research as well as this study, students were required to write and record audio

commentaries; moreover, both studies found students having the most challenge with editing the video to align the audio recordings. Students had to work together to overcome these challenges, which is similar to how students use e-assessments to self-regulate and defeat any misconceptions.

**Formative e-assessment and self-regulation.** Web tools were also seen as highly effective in engaging the learner and serving as a useful tool for formative assessment. As districts move towards using classroom performance data to address the achievement gap, teachers are turning to technology to provide e-assessments and immediate, frequent feedback (Nolan, Preston, & Finkelstein, 2012). Sainsbury and Benton (2011) conducted a study to understand how teachers used e-assessments for teaching and learning. The results indicated that the natural place for e-assessments is within the planning stages of teaching (Sainsbury & Benton, 2011). Using technology in the planning stages of teaching was how Bob utilized e-assessments in this study. He polled his students to determine their understandings and know if he needed to further review or if he could move on.

Ferrão (2010) conducted a correlation study to determine if an e-assessment could garner similar results to an open-ended, paper and pencil assessment. The results showed remarkable consistency between the two types of assessments (Ferrão, 2010). Furthermore, students indicated they would prefer the use of more e-assessments across all disciplines (Ferrão, 2010). While the research showed formative e-assessment to be a useful strategy, several of the participants in this study did not use the device for e-assessment. Working together to understand how to incorporate an e-assessment into the

curriculum could prove useful to both teachers and students at this study's district. Collaboration could also assist in teachers overcoming some of the challenges revealed in this study.

**Challenges of Blended Learning**

The teachers revealed several challenges as well, which corresponded to the recent literature. Teachers commented about students disengaging in the learning process as they visited gaming sites. Also, teachers noted the challenges of broken devices, the need for students to charge their device throughout the school day, and the occasional infrastructure problem with intermittent Wi-Fi. Finally, teachers confessed that while the district offers a lot of PD, there is little time to collaborate on how they effectively integrate the device into their daily practice and curriculum especially inter-departmentally. These findings are similar to the research. Research by Karsenti and Fievez (2013) discussed how students used their device to disengage from class instruction.

**Disengagement.** Disengagement was seen as a problem both in this study as well as the research. Karsenti and Fievez (2013) surveyed 6,057 students and of those 6,055 reported that iPads can be distracting. Likewise, 301 teachers out of the 302 surveyed remarked that iPads are a major source of distraction (Karsenti & Fievez, 2013). Students reported distractions included social media and playing games (Karsenti & Fievez, 2013). Karsenti and Fievez recommended that leaders, teachers, and students work collaboratively to devise a program that promotes accountability and responsible use of the device.

Chou, Block, and Jesness (2014) also reported distraction as a challenge in their study. Students revealed they found it easy to disengage because of the multitude of apps as well as the ease of access to the Web (Chou, Block, & Jesness, 2014). Furthermore, Chou et al. stated that it was difficult for teachers to manage the iPad use because the ease to which students moved between pages. These researchers (Chou et al., 2014) recommended that teachers devise well-prepared lessons to keep students on task. However, teachers need time to learn and share ideas about how to effectively implement technologies (Buckenmeyer, 2010).

**Device and infrastructure concerns.** There were several concerns revealed about the device in this study. Participants commented about devices being broken, problems with the device maintaining a charge throughout the day, and occasional problems with intermittent Wi-Fi access. In a recent bulletin titled *Making 1:1 Work* (2014), several IT directors reported similar concerns. The Chief Information Officer from Tippecanoe School District in Indiana reported that both hardware and software, as well as student repairs and maintenance, has been their biggest challenge in going one-to-one (Making 1:1 Work, 2014). In that report (Making 1:1 Work, 2014), Director of IT in New Berlin, Wisconsin stated his district needed to increase the bandwidth and connectivity to provide continued access to the Internet.

Crichton, Pegler, and White (2012) documented that districts must find a method to sync, power, maintain, and manage personal devices in public settings. These researchers (Crichton, Pegler, & White, 2012) recommended a digital commons or a central location where students can maintain their device. However, they recognized the

responsibility of the digital commons would fall on the teachers (Crichton et al., 2012). Overall, Crichton et al. recommended districts work together to support the device whether that is through increasing the infrastructure, creating a digital commons, or creating acceptable use guidelines.

**Time for collaboration.** For technology to be effectively integrated, districts must provide time for teachers to collaborate. Teachers must work collaboratively to discuss, model, and share openly about best practices for change to be sustainable (Killion & Roy, 2009; Waddell & Lee, 2008). Knowledge is acquired when teachers share (Rismark & Sølvberg, 2011). In a study conducted by Rismark and Sølvberg (2011), teachers reported positive attitudes regarding erudition if they were provided opportunities to share. Through shared experiences, teachers were able to grow and learn (Rismark & Sølvberg, 2011).

According to Davies (2011), to build technology literacy, teachers must be exposed to various technologies and engage in activities to help them become more familiar. With guidance and practice, teachers can move to the highest level of technology integration (Davies, 2011). Kenney et al. (2010), as well as Hilliard and Newsome (2013), purported learning communities are essential for educators to continue the technology integration practice. PLCs offer teachers the opportunity to collaborate, practice, and share experiences.

Jones and Dexter (2014) reported rapport between teachers increased due to PLCs. Providing the time for teachers to share assists in building relationships. One teacher testified to feeling "in the dark" because she had a schedule change and was

unable to attend the groups PLC time (Jones & Dexter, 2014). Time and support were also viewed as an essential element for technology integration in the study completed by Buckenmeyer (2010). Teachers need time to learn the new technologies and support on how to effectively implement those technologies (Buckenmeyer, 2010). PLCs can provide the support allowing teachers to improve their craft.

Prytula and Weiman (2012) identified three ways PLC's impacted a teacher's craft. The craft of teaching is a set of displayed skills that can be learned and improved through sharing (Prytula & Weiman, 2012). PLCs supply teachers with new ideas and approaches as well as moved teachers from being self-learners to social-learners (Prytula & Weiman, 2012). Finally, the craft of teaching supports teachers to display best practices and increases teacher confidence (Prytula & Weiman, 2012).

**Professional Learning Communities**

Teachers revealed that while the district offers a lot of PD, the district does not afford the time for cross-divisional meetings to collaborate and share on how they integrate various Web tools into their daily practice. To promote the widespread use of the device, teachers can share how they use the device for individualization, such as project-based learning, a tool for e-assessment, as well as how to create a more student-centered environment. A PLC can foster adult collaboration and sharing to improve instructional practices (DuFour & Fullan, 2015). A PLC would also promote the widespread integration of technology and encourage the utilization of various Web tools (Cifuentes et al, 2011). Furthermore, a PLC could address the district's problem of students may not be receiving a personalized educational experience or increased 21$^{st}$

century skills because some teachers may not be using of may be underusing the technologies and the LMS.

**Establishing a PLC**.  Collegial learning and improving teachers' craft requires collective participation.  Owen's (2014) study revealed that PLCs created an environment where collegial learning occurred, and teachers felt safe and supported in their learning.  Teachers also felt they were able to be creative.

Owen (2014) as well as Scott, Clarkson, and McDonough (2011) revealed that teachers recognized PLCs necessitate a shared mission, vision, and goals.  Owen conducted a case study to explore the experiences of teachers involved in a PLC.  The study, conducted at three "innovative schools" in Australia, documented how these characteristics were evident in the schools' PLCs (Owen, 2014, p. 61).

Similarly, Scott et al. (2011) presented their findings on the elements of effective PLCs.  The focus groups disclosed that PLCs encourage and function more effectively when there are shared values and vision (Scott, Clarkson, & McDonough, 2011).  Shared values and vision institute a collective commitment (Kohler-Evans, Webster-Smith, & Albritton, 2013).  Collective commitments, supported by PLCs, promote school improvement.

Intanam, Wongwanich, and Lawthong (2012) wanted to develop a model for building a PLC.  They surveyed 185 primary schools in Thailand to determine the key indicators of a PLC, which the results indicated the importance of shared norms and values (Intanam, Wongwanich, & Lawthong, 2012).  Shared values occur when

stakeholders' work together with shared responsibility (Lindsey, Jungwirth, Pahl, &

Lindsey, 2009).

PLCs grounded in these shared beliefs have distributed leadership (Scott et al.,

2011). Widespread leadership moves the culture from "my student" or "my classroom"

to "our students" and "our school" (DuFour & Fullan, 2013, p. 24). Creating a coalition

of teacher leaders builds enthusiasm and teacher buy-in (DuFour, 2012; Schlechty, 2009).

Learning communities offer opportunities for faculty to collaborate and establish shared

responsibility.

**Conclusion.** The literature corroborated the findings by stating that the blended

learning approach has many benefits but also poses several challenges. Integrating

technology into teaching allows flexibility for students and encourages individualization

in teaching and learning. While research varies on its impact on student engagement,

Saritepeci and Çakir (2015) found that teaching with technology directly impacts student

achievement. In addition, research reflected that an increase in digital literacy influenced

student preparedness for careers and college (Van Dam, 2012), as well as the use of a

LMS served as a useful tool for organization (Emelyanova & Voronina, 2014). Likewise,

Florian and Zimmerman (2015) and Downing et al. (2014) revealed that using various

Web tools increased collaboration, communication, and creativity. Finally, technology

has showed to be useful in providing immediate feedback on e-assessments (Ferrão,

2010; Sainsbury & Benton, 2011). However, researchers acknowledge that using Web

tools for the benefit of teaching and learning requires time for teachers to collaborate and

share (Buckenmeyer, 2010; Prytula & Weiman, 2012).

The participants in this study, as well as the literature, disclosed a few challenges to the integration of technology. Educators must find ways to manage distractions like social media and gaming (Karsenti & Fievez, 2013). Chou et al. (2014) recommended that teachers devise well-prepared lessons to keep students on task; however, teachers need time to learn and share ideas about how to effectively implement these technologies (Buckenmeyer, 2010). Furthermore, Crichton et al. (2012) documented that districts must find a method to sync, power, maintain, and manage personal devices by creating a digital commons or a central location where students can maintain their device. Finally, time to collaborate and share how to integrate technology effectively was disclosed as a challenge. Grounded in the framework of social constructivism, adults learn and change their practice when schools instill a culture of collaboration and collegiality (Semadeni, 2010). PLCs supply teachers with new ideas and approaches as well as move teachers from being self-learners to social-learners (Prytula & Weiman, 2012). Moreover, research has showed that PLCs can establish a collective commitment, which promotes school improvement (Kohler-Evans et al., 2013). Overall, this research supports the PLC's purpose, goal, and objectives, which is to improve technology integration and instructional practices, create a culture of sharing, and increase student achievement.

**Implementation of PLCs**

Research has showed that teaching with technology prepares students for college and adult life as well as provides a variety of benefits for teaching and learning; therefore, based on adult learning theory, adults must work together to acquire knowledge as well as the necessary skills and strategies for integrating technology into their teaching

(Downing et al., 2014; Florian & Zimmerman, 2015; Jackson, 2009; Van Dam, 2012). According to the participants, the district has provided the teachers ample PD; however, they admitted there are no formal opportunities for teachers to share technology innovations from department to department. Therefore, this project outcome necessitates the design of an interdepartmental PLC where teachers can increase their performance of technology as well as the utilization of various Web 2.0 tools through a collaborative approach.

The purpose for the PLC was to improve technology integration and instructional practices, which leads to improved student achievement (Saritepeci & Çakir, 2015). Each monthly session was designed to increase the knowledge of the high school teachers, so they more effectively implement the blended learning approach using tools like e-assessments, project-based learning, and communication tools such as blogs. The specific goal for the PLC was that all high school courses implement various technology tools, which encourages e-assessments, project-based learning, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year. To meet this goal, specific performance objectives were designed. Objective 1: In the fall of 2016, all teachers will assemble monthly in their PLC group to work interdepartmentally on integrating technology; Objective 2: Each month, teachers will collaborate, share, and apply various Web tools into their curriculum that encourage individualization, communication, collaboration, and creativity; Objective 3: After each PLC meeting, teachers will complete a short survey to evaluate the effectiveness of their PLC; Objective 4: In the fall of 2016 and the spring of 2017, the district will distribute a

technology integration survey to faculty to determine how the integration of technology has impacted teaching and learning including the potential change in practice.

**Implementation Timeline**

The PLC was designed to assist teachers in planning, sharing, and acquiring the knowledge and skills to integrate Web tools effectively. Each month, the district will designate time to implement various Web tools like Socrative, Thinglink, or Blogger. Table 3 outlines the suggested topics, activities, resources and timeline for PLCs; however, the activities conducted by the PLC groups may vary based upon discussions and the perceived needs of its members. For the PLC's monthly meetings, there are handouts to support the teachers as well as sign-in sheets and surveys allowing the administration to gauge the effectiveness of the PLC (see Appendix A).

For September, an overview of the purpose, goal, and objectives of the PLC is disclosed (see Appendix A). Teachers will complete a survey outlining their technology integration abilities (see Appendix A). The survey, which consists of 18 questions, asks teachers to rate their technology proficiency on a Likert Scale ranging from extremely rare or never to always or most of the time. Administrators will analyze the results allowing administrators to disperse the faculty successfully into PLC groups. Faculty will be dispersed for the year based on their department as well as their technology proficiency to create diverse groups of 25. Small groups allow teachers to work collaboratively in discussing, modeling, and sharing openly about best practice (Killion & Roy, 2009; Waddell & Lee, 2008). Rismark and Sølvberg (2011) revealed teachers had positive attitudes regarding erudition if they were provided opportunities to share and

through these share experiences, teachers were able to grow and learn.  Therefore, it is

judicious for the PLC groups to be small, enabling teachers to share experiences, discuss

best practice, and learn from one another.

Table 3

*Timeline for Professional Learning Communities*

| Suggested topic | Suggested activities | Resources | Timeline |
| --- | --- | --- | --- |
| September<br><br>Orientation of PLC | Whole school overview of the purpose, goal, and objectives of the PLC.<br>Complete the Teacher Survey on Technology Integration. | Lecture Hall<br>Handouts<br>Laptops<br>Survey | Ongoing<br><br><br>September<br>(30 minutes) |
| October<br><br>E-assessment Tools | Small PLC group discussions on the purpose of e-assessments and why teachers should use them.<br>Teachers create an e-assessment using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from October through May<br>(1 hour each) |
| November<br><br>E-assessment Tools | Small PLC group discussions on the impact of e-assessments on student learning.<br>Teachers create another e-assessment using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from October through May<br>(1 hour each) |

*(table continues)*

| Suggested topic | Suggested activities | Resources | Timeline |
|---|---|---|---|
| January<br><br>Project-based Learning | Small PLC group discussions on the purpose of project-based learning (PBL) and why teachers should use it.<br><br>Teachers create a PBL project using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from January through May<br>(1 hour each) |
| February<br><br>Project-based Learning | Small PLC group discussions on the impact of PBL projects on student learning.<br>Teachers create another PBL task using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from January through May<br>(1 hour each) |
| March<br><br>Blogs | Small PLC group discussions on the purpose of blogs and why teachers should use them.<br>Teachers create a blog using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from March through May<br>(1 hour each) |
| April<br><br>Blogs | Small PLC group discussions on the impact blogs on student learning.<br>Teachers create another way to incorporate blogs into their curriculum. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from March through May<br>(1 hour each) |

*(table continues)*

| Suggested topic | Suggested activities | Resources | Timeline |
|---|---|---|---|
| May | Highlight the successes of the year. | Lecture Hall Laptops Survey | May (30 minutes) |
| Wrap-up | Complete the Teacher Survey on Technology Integration. | | |

In October and November, PLC groups will meet to discuss why the faculty

should use e-assessments and the difference between formative and summative e-

assessments.  Formative assessments provide feedback to the learner and are described as

an assessment *for* learning (Crisp, 2011).  Formative assessments allow learners to adjust

their performance before a summative assessment or a high stakes test (Crisp, 2011).

Summative e-assessments assess the learners' achievement or skills and are described as

an assessment *of* learning (Crisp, 2011).  Four open-ended discussion questions are

provided to help initiate the discussions (see Appendix A).  These discussions will serve

as motivation and validation for using e-assessments.  Furthermore, the teachers will

learn about two e-assessment tools, Kahoot and Socrative, to create their e-assessments

(see Appendix A).

In January and February, the PLC focuses on project-based learning (PBL).  PBL

is an effective teaching method that engages and motivates students to work

collaboratively as they build in-depth content knowledge as well as demonstrates the

skills necessary for college and global citizenship (Larmer, Mergendoller, & Boss, 2015).

The Web tools that students use to complete a task are authentic and match what people

do in the real world (Larmer et al., 2015).  Furthermore, PBL allows students choices and

can serve as a formative or summative assessment.  Again, handouts are provided to provide discussion points and serve as a resource for implementing PBL (see Appendix A).  Teachers will learn a PBL tool, Thinglink, and design their own PBL task.

March and April activities emphasize using blogs in the classroom.  Blogs foster increased collaboration, communication, and the sharing of knowledge (Köse, 2010; Turban et al., 2011).  In addition to the discussion questions, teachers are provided resources to learn about a blog tool, Blogger, enabling them to establish one for their course (see Appendix A).

May is devoted to disseminating the effectiveness of the PLC by using the results of the pre and post Teacher Survey on Technology Integration as well as the monthly surveys on the individual PLC meetings (see Appendix A).  This information validates the time spent and provides a general understanding of the growth of the faculty. Furthermore, district administrators can use this information to outline how they will move forward in the coming year in regards to PLCs and technology integration to successfully integrate the blended learning approach.

**Potential Resources and Existing Supports**

The resources, shown in Table 3, needed to complete this project are various online tools, laptops, handouts, and surveys as well as the faculty's knowledge of their curriculum.  The online tools included Kahoot, Socrative, Thinglink, and Blogger to name only a few.  Teachers will need their school provided laptop to experiment with the various Web tools.

The administrative staff, as well as teacher leaders, will provide support for the PLCs.  The high school principals and technology integration specialist play a pivotal role in dispersing teachers to create diverse PLC groups based on technology proficiency and department.  In addition, the central office staff, including the Director of Curriculum and Instruction or Director of Research and Evaluation, will assist in disaggregating the survey data as well as disseminating the results of the data to the staff.  Furthermore, the district leaders will need to analyze the data trends from the post Teacher Integration Survey to that of the 2017 high school graduation rate to determine the impact technology has had on student performance.

**Potential Barriers and Solutions**

While attending the PLCs is mandatory, some teachers or groups may work more effectively at integrating technology into their curriculum.  Furthermore, some individuals or groups may have more collegiality and; therefore, profound discussions and sharing can occur, which leads to increased professional growth.  I suggest the building principals and the technology integration specialist visit the PLC groups to offer feedback and work with teacher leaders to enhance the discussions and sharing of knowledge.

Another barrier might be scheduling the PLCs throughout the school year.  The district has designated weekly late start days where teachers meet as departments.  Therefore, I suggest reassigning one of these days each month for faculty to work in small groups to enhance the integration of technology and the blended learning approach.

**Proposal for Implementation and Timetable**

PLCs create an environment where collegial learning occurs, and teachers feel safe and supported in their learning (Owens, 2014). Moreover, teachers can discuss the benefits, challenges and in general support each other to improve their instructional practices. Therefore, teachers must be afforded the time to work collaboratively to discuss, model, and share openly about best practices in order for change to be sustainable (Killion & Roy, 2009; Waddell & Lee, 2008). As a result, the proposed implementation and timetable will be for the 2016-2017 school year. The intention is to implement this project during the Wednesday morning late starts that have been regularly scheduled by the district.

**Roles and Responsibilities of Student and Others**

As the researcher, I have provided the district the handouts, sign-in sheets, and survey questions. The high school principals will need to designate the day each month that will be devoted to the PLC. Also, the high school principals and technology integration specialist will need to create the PLC groups as well as attend the monthly meetings. The PLC facilitator will provide the classroom for the group to meet monthly.

<div align="center">

**Project Evaluation**

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The project will be evaluated on formative and summative data. Killion and Roy (2009) suggest that leaders should regularly evaluate their work to create a change in practice, therefore, leading to improved student learning. Consequently, I have created monthly formative surveys as well as pre and post surveys that will be summative in nature.

The PLCs formative evaluation, which will be a monthly survey and attendance records, will focus on how effectively the groups worked and their discussions (see Appendix A). According to Killion and Roy (2009), formative evaluations look at the action, not the results. These monthly surveys, which consist of five similar questions, evaluate the outcome of each PLC meeting and how well the group works to create an e-assessment, PBL, or blog. The attendance record and the questions, which teachers answer using a 5-point Likert scale that ranges from strongly disagree to strongly agree, will allow leaders to assess teacher attendance, understanding, and performance according to the goal and specifically to Objectives 1, 2, and 3 of the project outcome. This type of evaluation will also allow leaders to gauge each group's effectiveness and intervene if necessary.

The PLCs summative evaluation will be the pre and post Teacher Survey on Technology Integration (see Appendix A). Summative evaluations allow the district to determine if the goal and objectives were met (Killion & Roy, 2009). The identical pre and post surveys shown specifically to occur in the months of September and May, consist of 18 questions and ask teachers to rate their technology proficiency on a Likert Scale ranging from extremely rare or never to always or most of the time. The survey questions gauge the way teachers promote, support, and engage students using technology.

Data will be collected before the start of the PLC, each month following the PLC group meeting, as well as at the end of the year. Each survey, shown in Appendix A, will be evaluated according to descriptive statistics–mode, mean, median, standard deviation,

to provide a general understanding of how varied the scores are as well as insight into how each month compares to the next (Creswell, 2012). A change in the data for each question will reflect the overall effectiveness of the PLC in regards to that question as well as potential teacher growth. In addition, the pre and post survey data will be analyzed using inferential statistics. These results will indicate if the results are statistically significant and whether the PLC impacted teaching and learning as well as inform district leaders on how to proceed in future training or development (Creswell, 2012). Furthermore, the change in survey results can be correlated to the change in graduation rate to determine if technology integration impacts graduation rate and accomplishes Objective 4.

## Implications Including Social Change

### Local Community

The local problem addressed in this study was some teachers in the district may not be using or may be underusing ICT; therefore, students of these teachers may not receive a personalized educational experience or increased 21st century skills (D.R., personal communication, December 27, 2014; D.Z. personal communication, December 19, 2014; T.C., personal communication, January 11, 2015). By providing a PLC focused on technology integration, I anticipate the increased utilization of various Web 2.0 tools to personalize the educational experience for students.

Increasing the integration of technology is important because it can transform teaching from teacher centered to student centered learning. Student-centered classrooms encourage students to be active in the learning process by promoting new and effective

ways to communication and collaborate as well as share knowledge (DePietro, 2013; García-Valcárcel et al., 2014).  Therefore, blending technology with traditional teaching and curriculum would provide students with unlimited opportunities for academic growth, creativity, and the critical thinking skills needed their future.

Since Minnesota's Education Act of 2013, known as the World's Best Workforce initiative, this district has strived to provide that all their students are ready for college and careers (Minnesota Department of Education, 2014d).  Furthermore, the community has made a financial commitment to ICTs with the purchase of one-to-one iPads for all students in grades 4 -12.  Therefore, increasing the instructors' pedagogy to assimilate technologies is vital.

By effectively integrating technologies, teachers can motivate and engage the learners in an individualized, student-centered classroom.  This project study will contribute to the positive social change by providing the teachers with the knowledge and skills to better assimilate technologies.  Moreover, students, families, teachers, and administers will benefit from students being actively involved in the learning process.

**Far-Reaching**

Researchers have emphasized that students need deeper learning that fosters critical thinking, problem-solving skills, collaboration, and communication skills, as well as 21st century technology skills to be ready for college and careers (Darling-Hammond et al., 2014).  Technology offers the proficiencies to succeed in postgraduate careers (Hall et al., 2013).  In fact, Van Dam (2012) affirmed that emerging technologies are shaping the way people learn.  Therefore, educators must find ways to integrate technology

effectively to create students who can compete on a global level while producing solutions to the problems of tomorrow.

## Conclusion

The literature corroborated this study's findings of the benefits and challenges to the blended learning approach. Integrating technology directly impacts student learning and influences student preparedness for the 21st century workforce (Saritepeci & Çakir, 2015; Van Dam, 2012). However, teachers need time to learn and share ideas about how to effectively implement these technologies (Buckenmeyer, 2010). Kenney et al. (2010) and Hilliard and Newsome (2013) asserted that PLCs are fundamental for educators to advance their knowledge and skills and, therefore, integrating higher levels of ICT.

Based on recent literature and district leader's desire to personalize education as well as prepare students for the ever-changing global society, a yearlong PLC was created allowing for teachers to collaborate, share, and support one another. The purpose for the PLC was to improve technology integration and instructional practices, which leads to improved student achievement (Saritepeci & Çakir, 2015). The specific goal for the PLC was that all high school courses implement various technology tools, which encourages e-assessments, project-based learning, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year. Four specific performance objectives were designed to meet this goal. Each monthly small group session was designed to increase the knowledge and skills of the high school teachers so they can more effectively implement the blended learning approach using tools like e-assessments, PBL, and communication tools such as blogs. The intention is to implement this project

during the Wednesday morning late starts that have been regularly scheduled by the

district.  To determine the effectiveness of the PLC, monthly surveys, as well as pre and

post survey results, will serve as formative and summative evaluation tools.

By providing a PLC focused on technology integration, I anticipate the increased

utilization of various Web 2.0 tools to personalize the educational experience for

students.  Therefore, students will develop deeper learning that fosters critical thinking,

problem-solving, collaboration, and communication skills (Darling-Hammond et al.,

2014).  Also, students will garner 21st century technology skills enabling them to be

ready for college and careers, as well as compete on a global level to produce solutions to

the problems of tomorrow.  The next section discusses the project's strengths, limitations,

and recommendations for handling these limitations as well as the project development.  I

also reflect on the research process and analyze myself as a scholar, leader, and agent of

change.

Section 4: Reflections and Conclusions

**Introduction**

The purpose of this case study was to explore early technology adopter's perceptions of how the blended learning approach influenced teaching and learning as well as how Moodle was used as a tool for e-assessment. Section 4 provides my reflections on this study. I will outline the project's strengths, its limitations, and my recommendations for handling these limitations. I will also reflect on the project development and discuss the research process as well as analyze myself as a scholar, leader, and agent of change. Finally, I will disclose the project's potential impact on social change along with reflect on the direction of future research.

**Project Strengths**

As a scholar and practitioner, I suggest that the major strengths of the project include creating a collegial learning environment where teachers feel safe and supported as well as providing opportunities for teachers to be creative, innovative, and improve their technology integration. This project outcome also addresses the district's problem that students may be slighted in that some teachers do not adapt quickly to the new instructional approach involving technology. Throughout the study, it was evident that teachers who use the blended learning approach felt they had a positive impact on students. Through interviews and observations, teachers revealed that integrating technology engaged students in a fun, yet thought-provoking, approach to teaching and learning. In their opinion, this approach allowed for teaching to be individualized, student-centered, and provided real-world relevance as well as assisted in organization

and providing timely feedback. While teachers revealed several challenges, the participants recognized these were being improved; however, they did admit there was a need for establishing a culture of sharing. Therefore, this project outcome was created to address this concern as well as increase teacher's practice to this new instructional approach. This project outcome was written for both novice and experienced technology users. Strengths of this project include creating a collegial learning environment where teachers feel safe and supported. There are also opportunities for teachers to be creative, innovative, and improve their technology integration. While the project has several strengths, it also has limitations.

### Recommendations for Remediation of Limitations

This project may have some limitations, as teacher "buy-in" is an essential factor in the success of teacher growth and technology integration. It is essential that teachers want to integrate technology into their daily practice as well as the group's facilitator understands the member's feelings and technology needs. I recommend that the members are able to conduct member visits or walk-throughs, which could aid in their understanding of why or how to integrate technology.

Walk-throughs alone could serve as a different way to address the problem. Formative walk-throughs emphasize learning. Peers or administrators conduct walk-throughs with the intent to understand what the students are doing, learning, or saying (Moss & Brookhart, 2013). Formative walk-throughs encourage collaboration, conversations, and inquiry (Moss & Brookhart, 2015).

Another way to address the problem would be through collective inquiry. Collective inquiry allows teachers to concentrate on improving instructional practices and takes an inquiry stance or the role of a researcher (Darling-Hammond & Richardson, 2009; Dickerson, 2011; Hughes-Hassell, Brasfield, & Dupree, 2012). Working together, educators can examine their practice to determine the impact their work is having on students' learning (Lindsey et al., 2009). Moreover, engaging educators in the data analysis process ensures teacher buy-in (Hirsh & Killion, 2009). With a focus on students learning and with a continuous practice of examining teacher practice, teaching and learning improves (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Schmoker, 2006). Overall, walk-throughs and collaborative inquiry can foster a shared purpose and should be considered; however, literature has shown that PLCs produce a collective commitment to increasing technology integration.

## Scholarship

Over the course of this study, I have learned the importance of using recent literature to support my practice. I also understand the current research surrounding technology integration. While I have personal experiences and have made personal observations of teachers struggling to integrate technology, I did not have the theoretical background to understand why or how to address the issue. Additionally, I have found that using current research allowed me to understand the problem more thoughtfully as well as understand the various solutions. Furthermore, I will use this new knowledge to inform others about best practice and hopefully inspire them to make positive changes in their practice.

**Project Development and Evaluation**

I learned through this project development the importance of using the findings to create a plan based on a problem and the recent literature. In developing the project outcome, I considered the participant's thoughts and current research to formulate the best possible solution. Creating the purpose, goal, and objectives allowed me to develop an outcome that addressed the district's problem as well as evaluate its effectiveness.

As a scholar and practitioner, I realize that each project outcome must be carefully planned according to goals and objectives, but it also must be evaluated for its effectiveness. A comprehensive evaluation allows for leaders to measure the success of the goals and objectives. Furthermore, the results will reflect how the project outcome impacted the district's problem.

For this project outcome, monthly meetings were designed to focus on various technology tools that foster individualization, communication, collaboration, and creativity. Formalizing the learning community sanctions the time for teachers to collaborate and share their experiences as well as instills a shared purpose. A major task of creating this project was creating all the materials, handouts, and evaluation tools. It is important to create these materials so the groups have a focus and accountability in the process.

**Leadership and Change**

Working on this project further justified to me why educators must work towards implementing technology to transform from teacher-centered instruction to student-centered learning. Technology serves as a useful tool to personalize learning and prepare

students to be global citizens with 21st century skills.  Moreover, it has reaffirmed my understanding that for technology integration to be successful, educators must plan, design, and create together to reduce isolationism and for change to endure.

Furthermore, the study substantiated the importance of using peer-reviewed literature to address problems.  As a leader, it is judicious to use the work of others to create positive social change.  Implementing these factors to create this project has provided me more confidence and a better understanding of what is required to be a successful leader that fosters best practice.  Being a leader requires scholarly work and lifelong learning.

### Analysis of Self as Scholar, Practitioner, and Project Developer

From this study, I have grown as a scholar.  Being a scholar requires advanced erudition, which only comes from profound research and analysis.  This process has enhanced my research skills, analytical thinking, and writing capabilities as well as my confidence as a leader.  I have thoroughly enjoyed the process, and I have persevered through all the challenges viewing them as opportunities to gain knowledge. This personal growth has inspired me to set new goals and dream of a career in academia.

I realized as a practitioner it is my responsibility to share my knowledge and skills.  Using the knowledge gained from this study, I have a commitment to student-centered pedagogy and am continually seeking improvements for students through research-based educational practices.  Furthermore, I intend to enhance teacher's practices by building on their successes to create positive and engaging learning environments through innovative practices.

My passion for integrating technology guided me in developing a successful project. From the beginning, I knew I wanted to investigate the impact technology had on teaching and learning. Therefore, overcoming the challenge of working with a district halfway across the country from me came easily. I quickly studied relevant literature, produced a solid proposal, and collected and analyzed data while carefully considering the participant's thoughts and suggestions as I assembled this final report. It has been my desire to improve practice that has served as my compass. I have learned to be a reflective, scholarly practitioner who is focused on best practice to make a positive impact on education.

## The Project's Potential Impact on Social Change

The results of this project could impact social change at the local level and beyond. Teachers sharing and collaborating in PLCs may change their teaching practice. Moreover, the impact this approach may have on student learning could be profound and life changing. Not only does research on blended learning indicate an improved academic performance (Saritepeci & Çakir, 2015), it also provides students with the proficiencies to succeed in postgraduate careers (Hall et al., 2013). To have a broader impact, I intend to use the research garnered from this Minnesota district and reproduce the project at my school, which has also recently gone to a one-to-one approach with technology.

## Implications, Applications, and Directions for Future Research

This research revealed how high school teachers who use the blended learning approach perceived it impacted teaching and learning. These teacher participants valued

and used technology in their daily practice.  This study could be expanded to the rest of the district levels having a broader impact on teaching and learning within the district.

Future research could also determine why some teachers in this district are not using the blended learning approach.  This research could also assist in understanding how to achieve higher levels of technology integration.  Furthermore, understanding how and why teachers across the nation are struggling to integrate technology could impact teaching and learning as well as producing 21$^{st}$ century global citizens.

**Conclusion**

This project study was designed based on my beliefs as well as recent research on how technology impacts teaching and learning.  It is unknown at this time if the school in this study will implement the project; however, the knowledge gained has served beneficial for me as a researcher.  It is my intention to share the findings and project outcome with the study's district hoping that the community integrates technologies more effectively therefore impacting the educational experience for the students.  Moreover, as a leader, I will continue to work towards enhancing teacher's practices by building on their successes to create positive and engaging learning environments that foster innovative practices.  Innovative practices that have students employing 21$^{st}$ century technology skills allow them to be ready for college and careers, as well as compete on a global level, to produce solutions to the problems of tomorrow.

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Appendix A: The Project

# Employing Technology as an Instructional Tool

Professional Learning Community Plan

Fall 2016

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- Handouts on Kahoot and Socrative developed for teacher leaders
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**Introduction**

This professional learning community (PLC) is designed to assist teachers in planning, sharing, and acquiring the knowledge and skills to effectively integrate Web tools, like Socrative, Thinglink, or Blogger, allowing the high school teachers to increase their use of Web tools. The plan is based on the data analyzed as well as recent literature. This PLC plan can promote the widespread integration of technology, encourage the utilization of various Web tools, and improve instructional practices.

**Purpose, Goal, and Objectives**

The purpose of this PLC is to increase the knowledge of the high school teachers so they can more effectively implement a variety of digital tools into the blended learning approach. The specific goal for the PLC is that all high school courses will implement various technology tools, which encourages e-assessments, PBL, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year. There are four objectives. Objective 1: In the fall of 2016, all teachers will assemble monthly in their PLC group to work inter-departmentally on integrating technology; Objective 2: Each month, teachers will collaborate, share, and apply various Web tools into their curriculum that encourage individualization, communication, collaboration, and creativity; Objective 3: After each PLC meeting, teachers will complete a short survey to evaluate the effectiveness of their PLC; Objective 4: In the fall of 2016 and the spring of 2017, the district will distribute a technology integration survey to faculty to determine how the integration of technology has impacted teaching and learning including the potential change in practice.

**Intended Audience**

The intended audience for this PLC is the high school teachers who deliver content related curriculum. It is essential to afford the time for teachers to collaborate, practice and learn, as well as reflect on how technology impacts teaching and student learning (Hilliard & Newsome, 2013; Kenney et al., 2010). The results of this PLC will encourage teachers to higher levels of tech integration as well as personalizing learning and enhancing students' 21st century technology skills.

**Design of Project Study**

The design of this project study is monthly PLC meetings and is organized by concepts that are discussed. Each of the months is denoted with a different symbol seen here.



Denotes September's Orientation PLC Meeting on the goal, purpose, and objectives



Denotes October and November's PLC on e-assessments



Denotes January and February's PLC on PBL tools

Denotes March and April's PLC on using blogs



Denotes May's PLC Wrap-up Meeting

These symbols are found on the front page of the month's handouts. Furthermore, each month, there is a synopsis of the approximate time that should be designated to accomplish the task, clear objectives, training materials or resources needed, the presenter(s) as well as sign-in sheet to track attendance. The chart that follows, titled *Timeline for Professional Learning Communities,* serves as a guideline for the suggested topics, activities, resources, and timeline for the implementation of the PLC in 2016 - 2017 school year.

# Employing Technology as an Instructional Tool

*Timeline for Professional Learning Communities*

| Suggested Topic | Suggested Activities | Resources | Timeline |
|---|---|---|---|
| September  Orientation of PLC | Whole school overview of the purpose, goal, and objectives of the PLC. Complete the Teacher Survey on Technology Integration. | Lecture Hall Handouts Laptops Survey | Ongoing September (30 minutes) |
| October  E-assessment Tools | Small PLC group discussions on the purpose of e-assessments and why teachers should use them. Teachers create an e-assessment using one of the Web tools. | Classrooms Handouts Laptops Survey | Ongoing from October through May (1 hour each) |
| November  E-assessment Tools | Small PLC group discussions on the impact of e-assessments on student learning. Teachers create another e-assessment using one of the Web tools. | Classrooms Handouts Laptops Survey | Ongoing from October through May (1 hour each) |
| No meeting in December | | | |

*(table continues)*

| Suggested Topic | Suggested Activities | Resources | Timeline |
|---|---|---|---|
| January<br><br>Project-based Learning | Small PLC group discussions on the purpose of project-based learning (PBL) and why teachers should use it.<br><br>Teachers create a PBL project using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from January through May<br>(1 hour each) |
| February<br><br>Project-based Learning | Small PLC group discussions on the impact of PBL projects on student learning.<br><br>Teachers create another PBL task using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from January through May<br>(1 hour each) |
| March<br><br>Blogs | Small PLC group discussions on the purpose of blogs and why teachers should use them.<br><br>Teachers create a blog using one of the Web tools. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from March through May<br>(1 hour each) |
| April<br><br>Blogs | Small PLC group discussions on the impact blogs on student learning.<br><br>Teachers create another way to incorporate blogs into their curriculum. | Classrooms<br>Handouts<br>Laptops<br>Survey | Ongoing from March through May<br>(1 hour each) |

*(table continues)*

| *Suggested Topic* | *Suggested Activities* | *Resources* | *Timeline* |
|---|---|---|---|
| May | Highlight the successes of the year. | Lecture Hall | May (30 minutes) |
| Wrap-up | Complete the Teacher Survey on Technology Integration. | | |

**Monthly Activities**

Each month has an agenda that outlines the time, objectives, resources, and presenters.  After the agenda, each month will have an attendance sheet.  Tracking attendance will allow the district to determine its performance on Objective 1.  Each of the months that follow the initial meeting allows the groups to discuss, share, and create activities using various Web tools, which promotes teachers to integrate technology successfully into their curriculum accomplishing Objective 2.  Furthermore, after each PLC meeting, teachers will fill out a short survey.  The survey gauges the effectiveness of that particular PLC group and meeting.

The monthly survey is a formative evaluation, which will focus on how effectively the groups worked and their discussions.  These monthly surveys, which consist of five similar questions, evaluate the outcome of each PLC meeting and how well the group works to create an e-assessment, PBL, or blog.  The attendance record and the questions, which teachers answer using a 5-point Likert scale that ranges from strongly disagree to strongly agree, will allow leaders to assess teacher attendance, understanding, and performance according to the goal and specifically Objectives 1, 2,

and 3 of the project outcome. This type of evaluation will also allow leaders to gauge each group's effectiveness and intervene if necessary.

The pre and post Teacher Survey on Technology Integration is a summative evaluation and also allows the district to determine if the goal and objectives were met. The identical pre and post surveys shown specifically in the months of September and May consist of 18 questions and ask teachers to rate their technology proficiency on a Likert Scale ranging from extremely rare/never to always/most of the time. The survey questions gauge the way teachers promote, support, and engage students using technology.

Each survey will be carefully evaluated according to descriptive and inferential statistics. Descriptive statistics determines the mode, mean, median, standard deviation and provides a general understanding of how varied the scores are as well as insight into how each month compares to the next (Creswell, 2012). A change in the average for each question will reflect the overall effectiveness of the PLC in regards to that question. In addition, the pre and post survey data will be analyzed using inferential statistics. These results will indicate if the results are statistically significant and whether the PLC impacted teaching and learning as well as inform district leaders on how to proceed in future training or development (Creswell, 2012). Furthermore, the change in survey results can be correlated to the change in graduation rate to determine if technology integration impacts graduation rate and accomplishes Objective 4.

**September**

     In the month of September, the high school faculty should meet as a large group to discuss and understand the purpose, goal, and objectives of the PLC.  A handout has been created to share these principles with the faculty.  Afterwards, faculty should take the Teacher Survey on Technology Integration, which allows administrators to disperse the faculty based on technology proficiency and by department.  The survey results, as well as the personal knowledge held by administrators, should reveal the teacher leaders.  These teacher leaders will serve as the groups' facilitators.  Teacher leaders should be selected based on having a high proficiency in technology skills as well as leadership skills at the school. Upon acceptance of the responsibilities, the teacher leaders as well as the PLC grouping should be disseminated to the faculty via email.

# Employing Technology as an Instructional Tool

## September PLC Meeting

September:  Orientation of PLC Meeting

Time: 30 minutes

Desired Outcomes/Objectives

By the end of the session, district and/or participants will:

- Understand the purpose, goals, and objectives of the PLC.

- Group faculty according to their technology proficiency.

Training Material or Resources

- Sign-in Sheet

- Handout from presenter

- Teachers' laptops

- Pre Teacher Survey on Technology Integration


Presenter

T.C., Technology Integration Specialist, presenter

# Employing Technology as an Instructional Tool

September Sign-in Sheet for Orientation of PLC Meeting

| Objective: | | Meeting Date: | |
|---|---|---|---|
| Facilitator: | | Place/Room: | |

| Last Name [print] | First Name [print] | Department | Signature |
|---|---|---|---|
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# Employing Technology as an Instructional Tool

## PLC's Purpose, Goal, and Objectives

**Purpose:**

The purpose of this PLC is to increase the knowledge of the high school teachers so they can more effectively implement a variety of digital tools into the blended learning approach.

**Goal:**

The specific goal for the PLC is that all high school courses will implement various technology tools, which encourages e-assessments, project-based learning, and communication tools to increase the high school graduation rate by 2% starting in the 2017 school year.

**Objectives:**

Objective 1: In the fall of 2016, all teachers will assemble monthly in their PLC group to work inter-departmentally on integrating technology.

Objective 2: Each month, teachers will collaborate, share, and apply various Web tools into their curriculum that encourage individualization, communication, collaboration, and creativity.

Objective 3: After each PLC meeting, teachers will complete a short survey to evaluate the effectiveness of their PLC.

Objective 4: In the fall of 2016 and the spring of 2017, the district will distribute a

technology integration survey to faculty to determine how the integration of technology

has impacted teaching and learning including the potential change in practice.

# Pre Teacher Survey on Technology Integration

Name _____          Department _____

**1.  Promote, support, and model creative and innovative thinking and inventiveness using digital tools and resources.**

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**2.  Engage students in exploring real-world issues and solving authentic problems using digital tools and resources.**

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**3.  Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.**

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**4. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.**

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**5. Design or adept relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**6. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**7. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**8. Provide students with multiple and varied formative and summative e-assessments and use resulting data to inform learning and teaching.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**9. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**10.  Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.**

                    1   2   3   4   5

Extremely Rare/Never  ○○○○○  Always/Most of the Time

**11.  Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.**

                    1   2   3   4   5

Extremely Rare/Never  ○○○○○  Always/Most of the Time

**12.  Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.**

                    1   2   3   4   5

Extremely Rare/Never  ○○○○○  Always/Most of the Time

**13.  Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.**

                    1   2   3   4   5

Extremely Rare/Never  ○○○○○  Always/Most of the Time

**14.  Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.**

                    1   2   3   4   5

Extremely Rare/Never  ○○○○○  Always/Most of the Time

**15.** **Participate in local and global learning communities to explore creative applications of technology to improve student learning.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**16.** **Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**17.** **Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**18.** **Regularly implements a variety of digital tools into your lessons.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

Adapted with permission from Chambersburg Area School District.

**October**

The focus for the month of October is e-assessments.  For this hour-long PLC group meeting, there is a handout outlining why the faculty should use e-assessments, the difference between formative and summative e-assessments as well as four open-ended discussion questions.  The four discussion questions are as follows:

1.  How do e-assessments promote student learning?

2.  What are the potential benefits and challenges of using e-assessments for both the students and the teacher?

3.  How does instant feedback change teaching and learning?

4.  How will the online component (i.e. e-assessments) correspond to the offline component of your curriculum?

Afterwards, the group will work collaboratively to create their e-assessment.  There are two tutorial handouts on two types of e-assessments–Kahoot and Socrative–to assist in this process.  After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

## October PLC Meeting on e-assessment Tools

October:  PLC Meeting on e-assessment Tools

Time: 1 hour

Desired Outcomes/Objectives

By the end of the session, participants will:

- Understand the importance of e-assessments in regards to self-regulation.

- Develop an e-assessment to integrate into their curriculum.

Training Material or Resources

- Sign-in Sheet

- Teachers' laptops

- Handout titled October PLC Meeting on e-assessment Tools

- Handouts on Kahoot and Socrative developed for teacher leaders

- Web tools–Kahoot and Socrative

- Evaluation Form for PLC Meeting  (e-assessment Tools)

Presenters

Various teacher leaders based on their indicated proficiency on the Teacher Survey on Technology Integration

# Employing Technology as an Instructional Tool

October Sign-in Sheet on e-assessment Tools

| Objective: | | Meeting Date: | |
|---|---|---|---|
| Facilitator: | | Place/Room: | |

| Last Name  [print] | First Name [print] | Department | Signature |
|---|---|---|---|
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# Employing Technology as an Instructional Tool

## October PLC Meeting on e-assessment Tools

**Information on e-assessments and Discussion Questions**

*Why use e-assessments?*

Web tools are seen as highly effective in engaging the learner and serving as a useful tool for assessment.   As this district moves towards using classroom performance data to address the achievement gap, teachers should utilize technology to provide immediate and frequent feedback (Nolan et al., 2012).  E-assessments can facilitate a quick diagnostic of student learning, which allows teachers to rectify any misconceptions or reteach if necessary.

E-assessments can be formative or summative in nature.  Formative assessments provide feedback to the learner and are described as an assessment *for* learning (Crisp, 2011). Formative assessments allow learners to adjust their performance before a summative assessment or a high stakes test (Crisp, 2011).  Summative e-assessments assess the learners' achievement or skill and are described as an assessment *of* learning (Crisp, 2011).

Questions for discussion:

1.  How do e-assessments promote student learning?

2.  What are the potential benefits and challenges of using e-assessments for both the students and the teacher?

3.  How does instant feedback change teaching and learning?

4.  How will the online component (i.e. e-assessments) correspond to the offline component of your curriculum?

Instructions:

Throughout the year, you are encouraged to use e-assessments in your curriculum.  The remainder of your PLC time is to work as a group to investigate a new e-assessment or create a new one for your curriculum.  There are two tutorial handouts on two types of e-assessments–Kahoot and Socrative–to assist in this process.  After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

PLC Meetings on e-assessment Tools

**Directions for using Kahoot:**

Setting up your account:

1. You will need to sign-up for a free account.  Go to www.getkahoot.com to fill out the required fields.
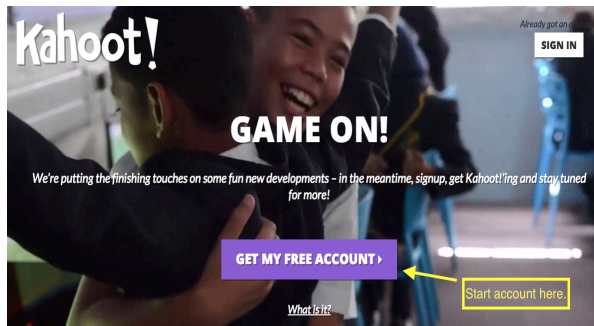


2. Select your Quiz, Discussion, or Survey.



3. Name your Quiz, ask a question in Discussion, or name the Survey.



Quiz Directions:

4. When creating a Quiz, you will need to record your quiz question. You will need to drop down the arrow to make it a *Points question* or a *No points question*. Also, you can change the time limit range from *5 seconds* to *120 seconds*. In the center screen, you are allowed to *choose a file* to upload an image or a video. At the bottom, you can record up to four answers. Be sure to change the red button to reflect the correct answer.

When you are finished with this question, you can add another question, cancel, or save and continue.



5. When you have completed all questions and have hit the green button to *Save & Continue*, your next screen will allow you to select Language, Privacy Settings, and Primary Audience as well as fill in a description, tags, and difficulty level.



6. The final step in the design process allows you to add a cover page or embed a video.

Quiz: Blended Learning Edit

*Optional:* Give your quiz a cover image

Drag and drop an image from your desktop here

or choose a file

No file chosen

Choose File

Adding images makes your quiz more engaging! If you choose not to, we'll put one of our own in for you

**Experimental!** Embed a YouTube video to be displayed in the background of the lobby screen as players join the game!

e.g. https://www.youtube.com/watch?v=Zhawgd0REhA

7. You have done it! You can play now, preview it, edit it, or share with other users.

DONE!

BLENDED LEARNING

Play now ▸

Preview         Edit

View Kahoot page or make another one

— SHARE YOUR KAHOOT NOW —

Share with other users ⌐
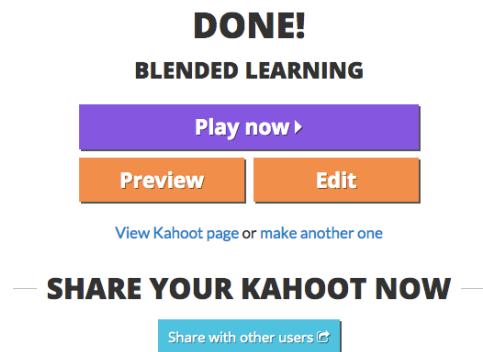
8. If you choose to *Play now*, a new screen will pop up that will ask you to Launch. In addition, you have several options to turn on and off.

Kahoot!

Quiz name

Blended Learning

Launch ▸

Display game-pin throughout?                                Off
Show minimised lobby instructions?                          Off
Randomise order of questions?                               Off
Randomise order of answers in each question?                Off
Play music in the lobby whilst waiting?                      On
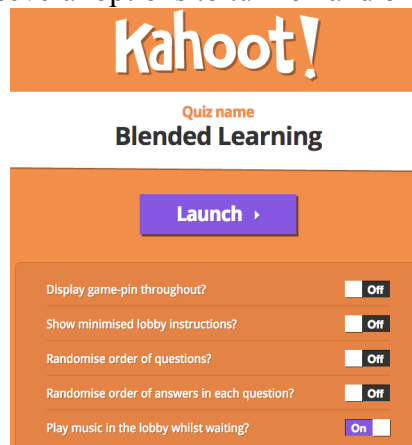
9. You are almost there. The final step after you have hit launch it to have your students join at kahoot.it where they will enter the game-pin. Have fun!

Directions to creating a *Discussion* or *Survey* are exactly the same.

Students will enjoy this very engaging activity.  Both you and the learners will receive immediate feedback allowing for you and your students to understand what they know and more importantly, what they do not know.

# Employing Technology as an Instructional Tool

PLC Meetings on e-assessment Tools

**Directions for using Socrative:**

Setting up your account:

1.  You will need to sign-up for a free account.  Go to www.socrative.com to fill out the required fields.
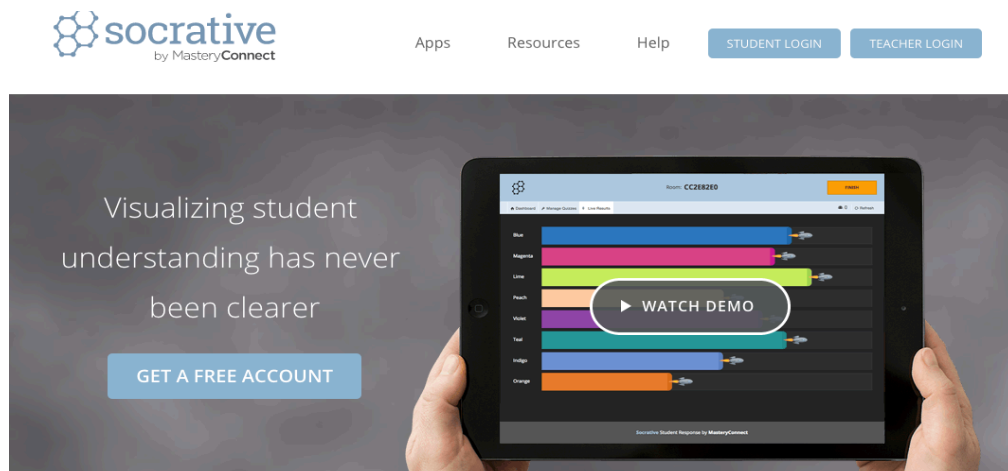


2.  Students will login using the "Room" code, similar to this one, found in the center

    

    of your computer screen.  Example:

3.  Select *Start a Quiz, Quick Question, Space Race,* or *Exit Ticket*.
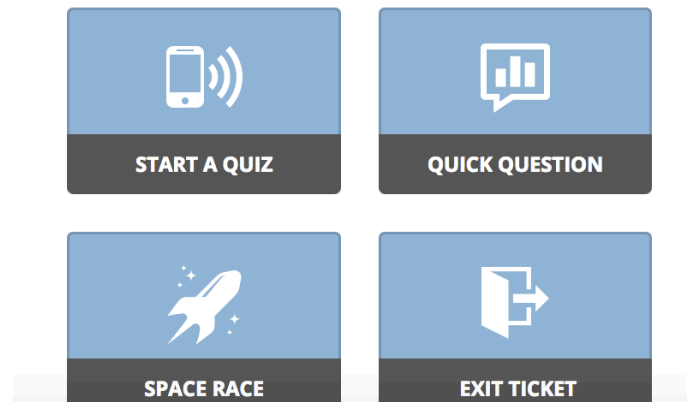
4. *Quick Question* allows you to create a multiple choice, true or false, or short answer. You can state the question out loud or in the case of short answer, you have the option to type in the question.

Quick Question

| MC | TF | SA |
|----|----|----|
| **MULTIPLE CHOICE** | **TRUE / FALSE** | **SHORT ANSWER** |

5. Space Race allows students to compete as a team. You select a quiz that you have written, the number of teams from 2 to 20, auto-assign or student select teams, and choose the figure that will race. You can also turn on or off feedback.

Room: **GCLNLX4X**

🏠 Dashboard    🔧 Manage Quizzes    🔊 Live Results

SELECT A QUIZ ▼

NUMBER OF TEAMS ▼

Auto-assign teams ▼

Rocket ▼

No    Hide Student Right/Wrong Feedback

START

6. Exit Ticket is similar to Quick Question. You can review students' results by clicking on the #1, #2, or #3.

🏠 Dashboard    🔧 Manage Quizzes    🔊 Live Results

**Exit Ticket Quiz**    Show Student Responses

| Name A-Z | Progress | #1 | #2 | #3 |
|----------|----------|----|----|----|
| Class Total | | | | |

Click on Question **#s** or Class Total **%s** for a detailed question view

An Exit Ticket Quiz will ask students three questions.

Question 1: How well did you understand today's material?

Exit Ticket Quiz

| BACK TO RESULTS TABLE | | NEXT |
| --- | --- | --- |

| #1 | How well did you understand today's material? |
| --- | --- |
| HOW'D WE DO? | 0/0 students answered |

| A | Totally got it |
| B | Pretty well |
| C | Not very well |
| D | Not at all |

▼ show explanation

Question 2:  What did you learn in today's lesson?

What did you learn in today's class?

SUBMIT ANSWER

Question 3:  Please answer the teacher's question.

Please answer the teacher's question.

SUBMIT ANSWER

7.  The Manage Quizzes tab allows you to create quiz, import quiz, review my quizzes, or create reports.

♠ Dashboard    ✎ Manage Quizzes    Live Results

CREATE QUIZ

IMPORT QUIZ
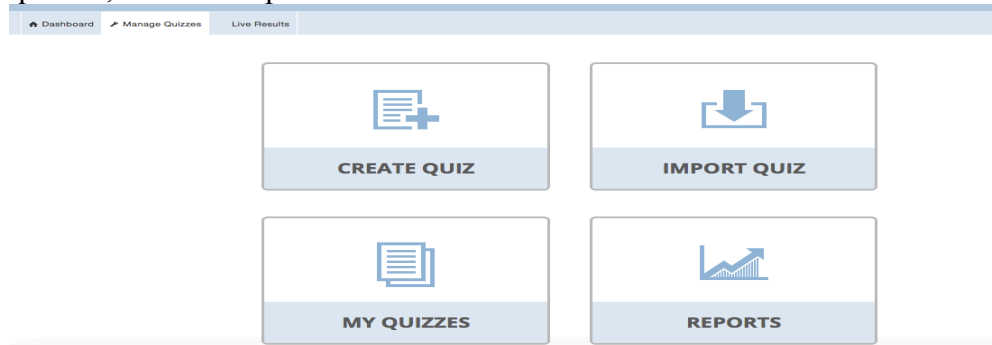
MY QUIZZES

REPORTS

8. When creating a report, you can choose to look at all, quizzes, space races, exit tickets, short answers, or archived reports. Reports can be exported to Excel, PDFs, emailed, viewed in a chart, or put on the dashboard. Student results as well as question results can be compared.

| RECENT | ALL | QUIZZES | SPACE RACES | EXIT TICKETS | SHORT ANSWERS | ARCHIVED REPORTS |
|---|---|---|---|---|---|---|

Select an Activity

| Exit Ticket Quiz - 8/30/2015, 12:20 PM | Archive |
|---|---|

| Exit Ticket Quiz - 8/30/2015, 11:23 AM | Archive |
|---|---|

# Employing Technology as an Instructional Tool

### Evaluation Form for PLC Meeting (e-assessment Tools)

Activity date: _____

This evaluation will provide data on the effectiveness of your group's PLC meeting. Please take a moment to complete the questions and return the form to your group's facilitator.  Thank you for your immediate feedback.

1.  The objectives of today's session were clear.

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

2.  Materials were easily understood.

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

3.  Discussions surrounding e-assessments were valuable.

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

4.  The PLC session inspired you to use e-assessments.

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

5.  The PLC session allowed you to create an e-assessment.

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

Other comments:

**November**

The focus for the month of November is still e-assessments.  For this hour-long meeting, faculty will reflect on using e-assessments by discussing four open-ended discussion questions on the disclosed handout.  The four discussion questions are as follows:

1.  How did e-assessments promote student learning?

2.  What were the benefits and challenges to using e-assessments for both the students and the teacher?

3.  How did the instant feedback change your teaching and student learning?

4.  How did the online component (i.e. e-assessments) correspond to the offline component of your curriculum?

Afterwards, the group will work collaboratively to create a new e-assessment.  If faculty has not tried both e-assessments, Kahoot and Socrative, they are encouraged to do so. To assist in this process, teachers should use last month's tutorial handouts.  After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

## November PLC Meeting on e-assessment Tools

November:  PLC Meeting on e-assessment Tools

Time: 1 hour

Desired Outcomes/Objectives

By the end of the session, participants will:

- Discuss how e-assessments have impacted teaching and learning.

- Develop a new e-assessment to integrate into their curriculum.

Training Material or Resources

- Sign-in Sheet

- Teachers' laptops

- Handout titled November PLC Meeting on e-assessment Tools

- Handouts on Kahoot and Socrative developed for teacher leaders

- Web tools–Kahoot and Socrative

- Evaluation Form for PLC Meeting  (e-assessment Tools)

Presenters

Various teacher leaders based on their indicated proficiency on the Teacher Survey on Technology Integration

# Employing Technology as an Instructional Tool

November Sign-in Sheet on e-assessment Tools

| Objective: | | Meeting Date: | |
|---|---|---|---|
| Facilitator: | | Place/Room: | |

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# Employing Technology as an Instructional Tool

## November PLC Meeting on e-assessment Tools

**Handout: Discussion Questions on Integrating e-assessments**

1. How did e-assessments promote student learning?

2. What were the benefits and challenges of using e-assessments for both the students and the teacher?

3. How did the instant feedback change your teaching and student learning?

4. How did the online component (i.e. e-assessments) correspond to the offline component of your curriculum?

Instructions:

Over the next month, you are encouraged to continue using e-assessments in your curriculum. The remainder of your PLC time is to work as a group to investigate a new e-assessment or create a new one for your curriculum.

# Employing Technology as an Instructional Tool

## November Evaluation Form for PLC Meeting

## (e-assessment Tools)

Activity date: _____

This evaluation will provide data on the effectiveness of your group's PLC meeting. Please take a moment to complete the questions and return the form to your group's facilitator.  Thank you for your immediate feedback.

1.  The objectives of today's session were clear.

     1   2   3   4   5

     Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

2.  Discussion questions were clear and thoughtful.

     1   2   3   4   5

     Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

3.  Discussions surrounding the impact of e-assessments were valuable.

     1   2   3   4   5

     Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

4.  The PLC session inspired you to use e-assessments.

     1   2   3   4   5

     Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

5.  The PLC session allowed you to create an e-assessment.

     1   2   3   4   5

     Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Other comments:

**January**

The focus for the month of January is using technology for PBL. For this hour-long meeting, there is a handout outlining why the faculty should utilize Web tools to foster PBL as well as four open-ended discussion questions. The four discussion questions are as follows:

1. How do you believe PBL promotes student learning?

2. What are the potential benefits and challenges of using PBL for both the students and the teacher?

3. How does PBL impact teaching and learning?

4. How did the online component (i.e. PBL) correspond to the offline component of your curriculum?

Afterwards, the group will work collaboratively to create a PBL task as well as understand one Web tool, like Thinglink. To assist in this process, there is a tutorial handout on Thinglink that could be used to create a PBL project; however, an individual or the group can decide to explore other Web tools. After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

## January PLC Meeting

January:  PLC Meeting on PBL Tools

Time: 1 hour

Desired Outcomes/Objectives

By the end of the session, participants will:

- Discuss how PBL impacts teaching and learning.

- Develop a PBL task to integrate into their curriculum.

Training Material or Resources

- Sign-in Sheet

- Teachers' laptops

- Handout titled January PLC Meeting on PBL Tools

- Handouts on Thinglink developed for teacher leaders

- Web tools – www.Thinglink.com or iMovie

- January Evaluation Form for PLC Meeting (PBL Tools)

Presenters

Various teacher leaders based on their indicated proficiency on the Teacher Survey on Technology Integration

# Employing Technology as an Instructional Tool

January PBL Sign-in Sheet

| Objective: | | Meeting Date: | |
| Facilitator: | | Place/Room: | |

| Last Name [print] | First Name [print] | Department | Signature |
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# Employing Technology as an Instructional Tool

## January PLC Meeting on PBL Tools

## Handout:  Information on PBL and Discussion Questions

*Why use PBL?*

PBL is an effective teaching method that engages and motivates students to work collaboratively as they build in-depth content knowledge as well as demonstrate the skills necessary for college and global citizenship (Larmer, Mergendoller, & Boss, 2015).  The Web tools that students use to complete a task are authentic and match what people do in the real world (Larmer et al., 2015).  Furthermore, PBL allows students choice and can serve as a formative or summative assessment.

1. How do you believe PBL promotes student learning?

2. What are the potential benefits and challenges of using PBL for both the students

   and the teacher?

3. How does PBL impact teaching and learning?

4. How did the online component (i.e. PBL) correspond to the offline component of

   your curriculum?

Instructions:

Over the next month, you are encouraged to continue using PBL tools in your curriculum.  The remainder of your PLC time is to work as a group to investigate a PBL tool to integrate a technology project into your curriculum.  One PBL Web tool is Thinglink (see handout).  This program allows the user to take photos and attach videos to them.

# Employing Technology as an Instructional Tool

## PLC Meetings on PBL Tools

**Directions for using Thinglink:**

Setting up your account:

1. Go to www.thinglink.com and create your free account. Once you have created an account, this will be the homescreen.

2. At the top of the page is a button called "Students." The free version allows 100 free students. On your first screen, you will need to "Go to your groups."



Now you will need to hit the settings button found on the right hand side of your screen (see red arrow below).



On the next screen, you will get a passcode that you give your students or you can register them yourself.

3. At the top of the homepage is the "Create" (+) button. You can upload an image or drag and drop.
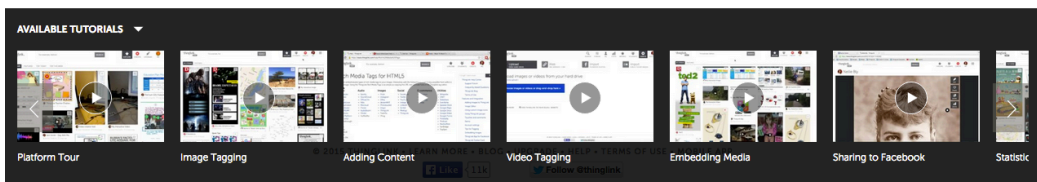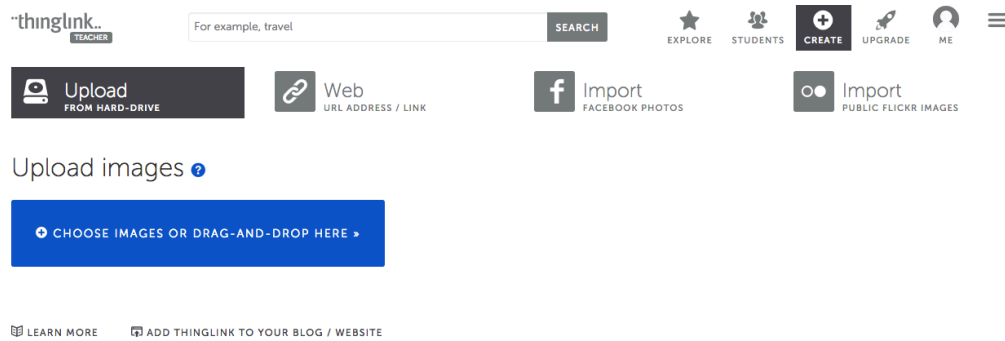


4. Once you have uploaded a photo, you will be asked to add information. Here you can type in a title, add video or music, and add a "tag" or words that will appear when your image is interactive. Don't forget to hit the save button.
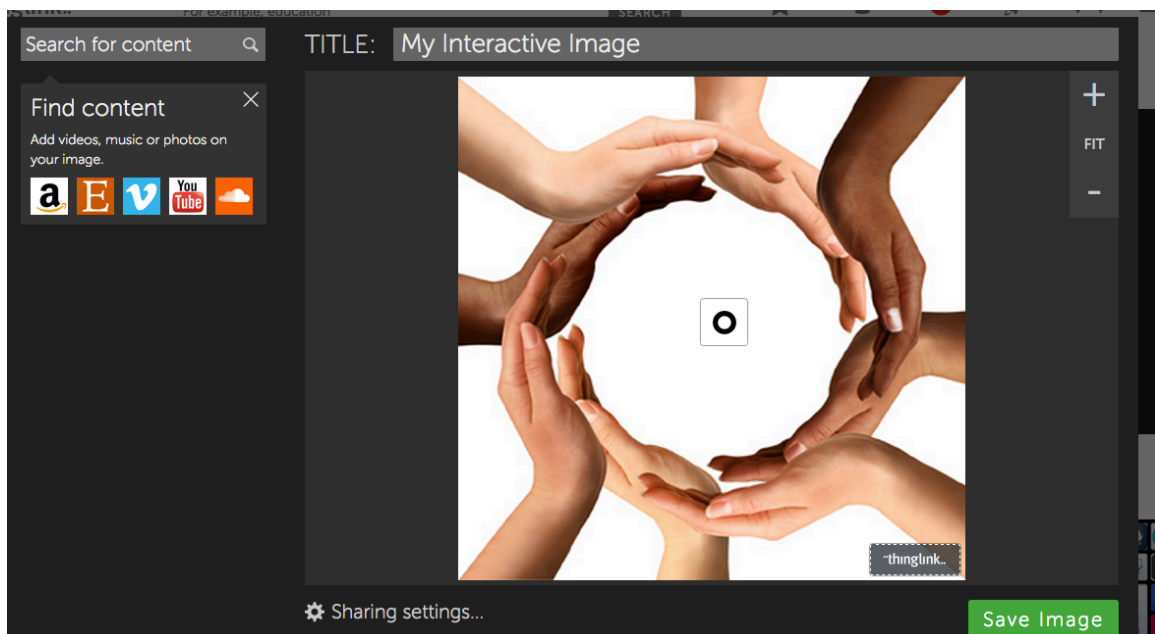
# Employing Technology as an Instructional Tool

### January Evaluation Form for PLC Meeting (PBL Tools)

Activity date: _____

This evaluation will provide data on the effectiveness of your group's PLC meeting. Please take a moment to complete the questions and return the form to your group's facilitator.  Thank you for your immediate feedback.

1.  The objectives of today's session were clear.

    |  | 1 | 2 | 3 | 4 | 5 |  |
    |---|---|---|---|---|---|---|
    | Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

2.  Materials were easily understood.

    |  | 1 | 2 | 3 | 4 | 5 |  |
    |---|---|---|---|---|---|---|
    | Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

3.  Discussions surrounding PBL were valuable.

    |  | 1 | 2 | 3 | 4 | 5 |  |
    |---|---|---|---|---|---|---|
    | Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

4.  The PLC session inspired you to use PBL.

    |  | 1 | 2 | 3 | 4 | 5 |  |
    |---|---|---|---|---|---|---|
    | Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

5.  The PLC session allowed you to create a PBL task.

    |  | 1 | 2 | 3 | 4 | 5 |  |
    |---|---|---|---|---|---|---|
    | Strongly Disagree | ○ | ○ | ○ | ○ | ○ | Strongly Agree |

Other comments:

**February**

The focus for the month of February is still on PBL. For this hour-long meeting, faculty will reflect on using PBL by discussing four open-ended discussion questions on the disclosed handout. The four discussion questions are as follows:

1. How did PBL promote student learning?

2. What were the benefits and challenges of using PBL for both the students and the teacher?

3. How did PBL impact teaching and learning?

4. How did the online component (i.e. PBL) correspond to the offline component of your curriculum?

Afterwards, the group will work collaboratively to create a new PBL task. The faculty is encouraged to collaborate and try a new Web tool, like iMovie. After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

## February PLC Meeting on PBL Tools

February:  PLC Meeting on PBL Tools

Time: 1 hour

Desired Outcomes/Objectives

By the end of the session, participants will:

- Discuss how PBL impacted teaching and learning.

- Develop a new PBL task to integrate into their future curriculum.

Training Material or Resources

- Sign-in Sheet

- Teachers' laptops

- Handout titled February PLC Meeting on PBL Tools

- Handouts on Thinglink developed for teacher leaders

- Web tool(s) – www.Thinglink.com or other selected by individual(s)

- February Evaluation Form for PLC Meeting (PBL Tools)

Presenters

Various teacher leaders based on their indicated proficiency on the Teacher Survey on Technology Integration

| Employing Technology as an Instructional Tool |||||
|---|---|---|---|---|
| February PBL Sign-in Sheet |||||
| Objective: | | | Meeting Date: | |
| Facilitator: | | | Place/Room: | |
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# Employing Technology as an Instructional Tool

## February PLC Meeting on PBL Tools

### Handout: Discussion Questions on Integrating PBL

1. How did PBL promote student learning?

2. What were the benefits and challenges to using PBL for both the students and the teacher?

3. How did PBL impact teaching and learning?

4. How did the online component (i.e. PBL) correspond to the offline component of your curriculum?

Instructions:

Over the next month, you are encouraged to continue utilizing Web tools for integrating PBL into your curriculum. The remainder of your PLC time is to work as a group to investigate a new tool or create a new PBL.

# Employing Technology as an Instructional Tool

## February Evaluation Form for PLC Meeting (PBL Tools)

Activity date: _____

This evaluation will provide data on the effectiveness of your group's PLC meeting. Please take a moment to complete the questions and return the form to your group's facilitator.  Thank you for your immediate feedback.

1. The objectives of today's session were clear.

                   1  2  3  4  5

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

2. Discussion questions were clear and thoughtful.

                   1  2  3  4  5

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

3. Discussions surrounding the impact of PBL were valuable.

                   1  2  3  4  5

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

4. The PLC session inspired you to use PBL.

                   1  2  3  4  5

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

5. The PLC session allowed you to create a PBL task.

                   1  2  3  4  5

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

Other comments:

**March**

The focus for the month of March is integrating blogs into the curriculum. For this hour-long meeting, there is a handout outlining why the faculty should utilize blogs to foster collaboration, communication, and higher level thinking skills as well as four open-ended discussion questions. The four discussion questions are as follows:

1. How do you think blogs can promote student learning?

2. What are the potential benefits and challenges of using blogs for both the students and the teacher?

3. How do blogs impact teaching and learning?

4. How did the online component (i.e. blogs) correspond to the offline component of your curriculum?

Afterwards, the group will work collaboratively to create a blog as well as understand one Web tool, like Blogger. To assist in this process, there is a tutorial handout on Blogger that could be used to create a blog; however, an individual or group can decide to explore other Web tools. After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

## March PLC Meeting

March:  PLC Meeting on Integrating Blogs

Time: 1 hour

Desired Outcomes/Objectives

By the end of the session, participants will:

- Discuss how blogs can impact teaching and learning.

- Develop a method to integrate a blog into their curriculum.

- Understand the software Blogger.

Training Material or Resources

- Sign-in Sheet

- Teachers' laptops

- Handout titled March PLC Meeting on Blogs

- Handouts on Google's Blogger developed for teacher leaders

- Web tools – www.blogger.com or other selected by individual(s)

- March Evaluation Form for PLC Meeting (Blog Tool)

Presenters

Various teacher leaders based on their indicated proficiency on the Teacher Survey on Technology Integration

# Employing Technology as an Instructional Tool

March Blog Sign-in Sheet

| Objective: | | Meeting Date: | |
|---|---|---|---|
| Facilitator: | | Place/Room: | |

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# Employing Technology as an Instructional Tool

March PLC Meeting on Blogs

## Handout:  Information on Blogs and Discussion Questions

*Why use blogs?*

Blogs play an important role in engaging students with a shared learning experience. A blog is a website that logs entries in reverse chronological order (Köse, 2010).  Blogs, allow students and teachers to share information, communicate, and collaborate (Köse, 2010; Turban, Liang, & Wu, 2011).  Also, blogs have shown to be an effective tool for formative assessment (Joshi & Babacan, 2012).

1. How do you think blogs can promote student learning?

2. What are the potential benefits and challenges of using blogs for both the students

   and the teacher?

3. How do blogs impact teaching and learning?

4. How did the online component (i.e. blogs) correspond to the offline component of

   your curriculum?

Instructions:

Over the next month, you are encouraged to continue using blogs in your curriculum. The remainder of your PLC time is to work as a group to investigate a blog tool and to integrate this technology into your curriculum.
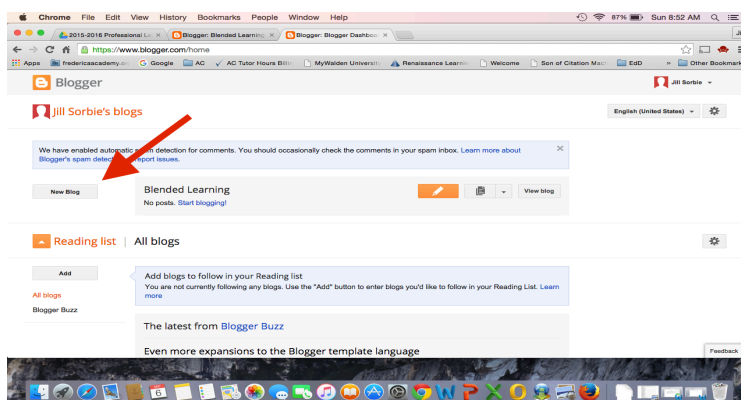
# Employing Technology as an Instructional Tool

## PLC Meeting on Blog Tools

**Directions for using Blogger:**

Setting up your account:

1. Blogger is a Google App.  Go to www.blogger.com and sign in to your Google account. Click on the button *New Blog* on the left hand side of screen.

2. The next window that pops up will have you name your blog, create a blog address, and select a template.  Use your first and last name along with blogspot.com.      Example:  jillsorbie.blogspot.com

3.    The next figure shows the home screen.  On the top in the grey bar is a pencil icon; it allows you to create a new post.  Clicking on the orange button titled *New post* can also do this operation.
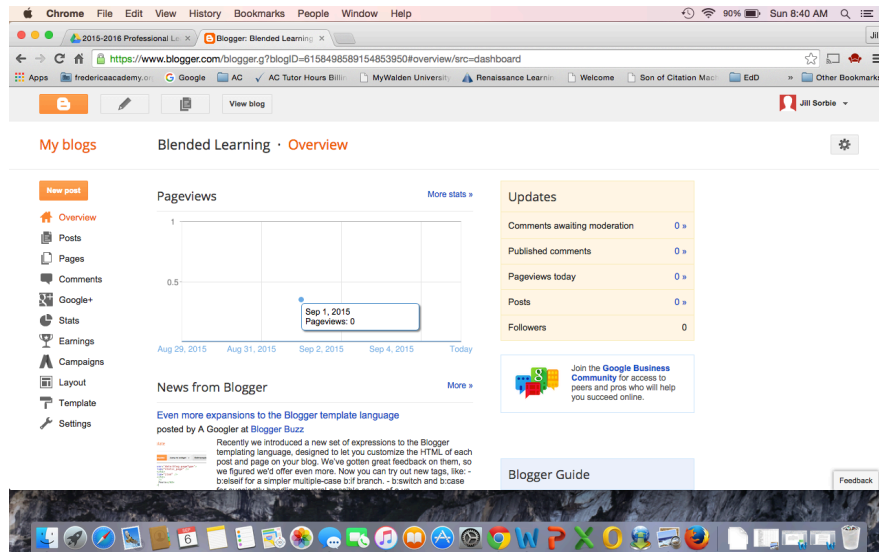


4.    When you click on *New post* or the pencil icon, a page pops up allowing you to add a discussion topic.  You are able to change font, size, color, add a link, picture, video, insert a jump break (page break), and so forth.
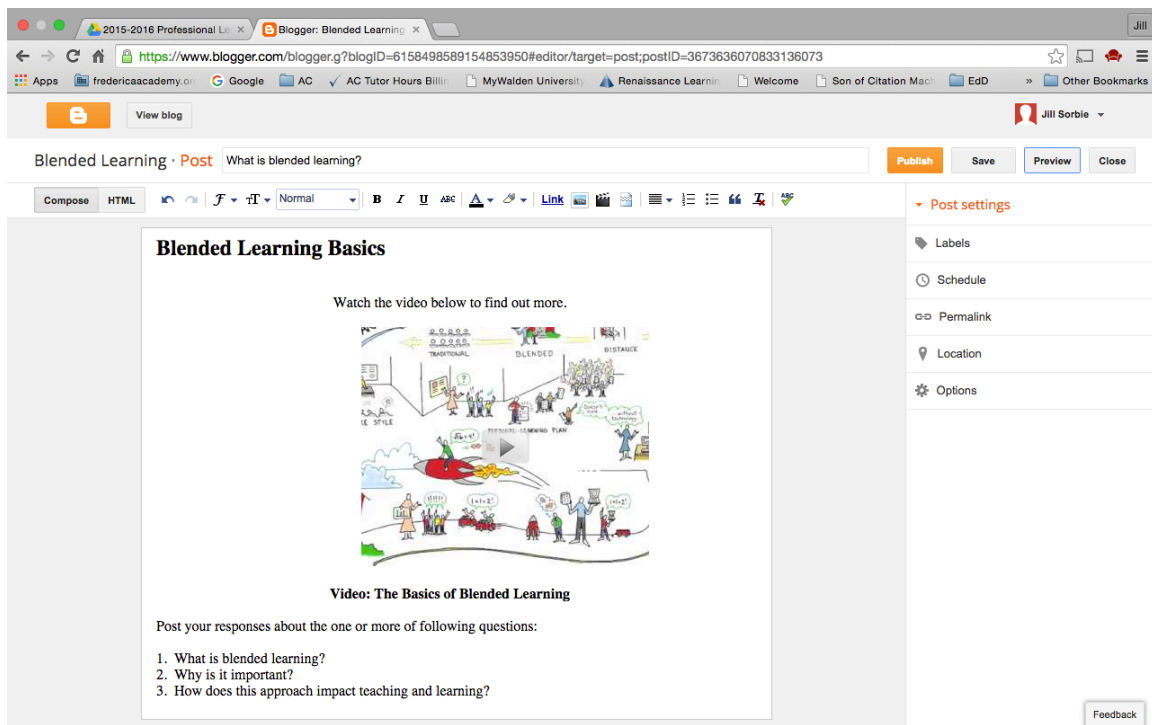
5. As you progress, you can save your blog and preview it; however, if you do accidently hit the publish button, you can still go back and edit the blog. Here is the published look.
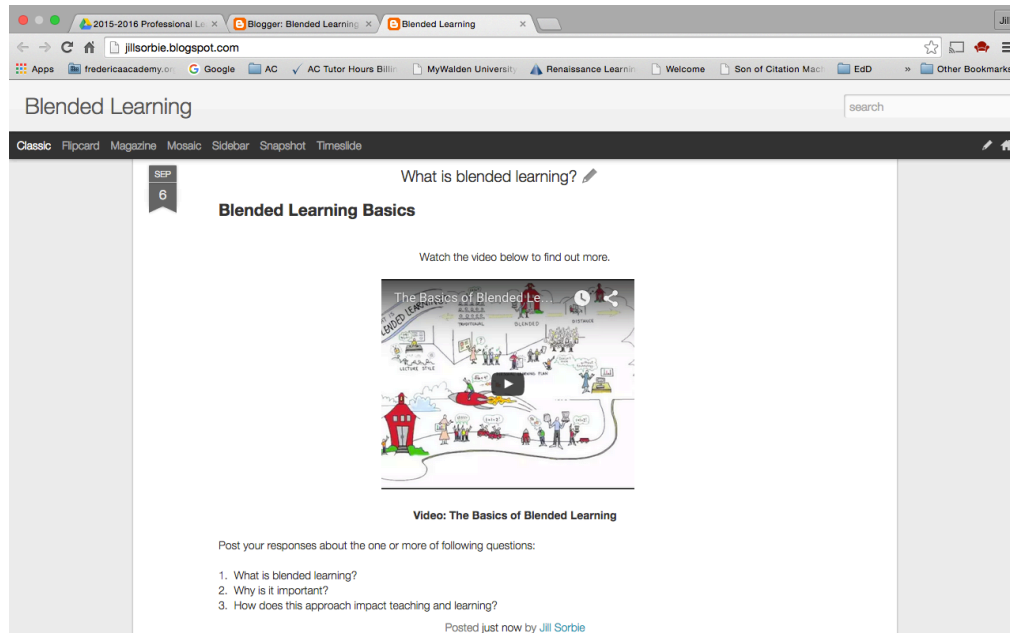


6. On the left of the home page, you can manage your blog in a variety of ways. Here are just a few:
    a. View your *Posts*
    b. Add or trash *Pages* under a specific post
    c. View or delete *Comments*
    d. Connect your blog to *Google+*
    e. Check the *Stats* – overview, posts, traffic sources, and audience
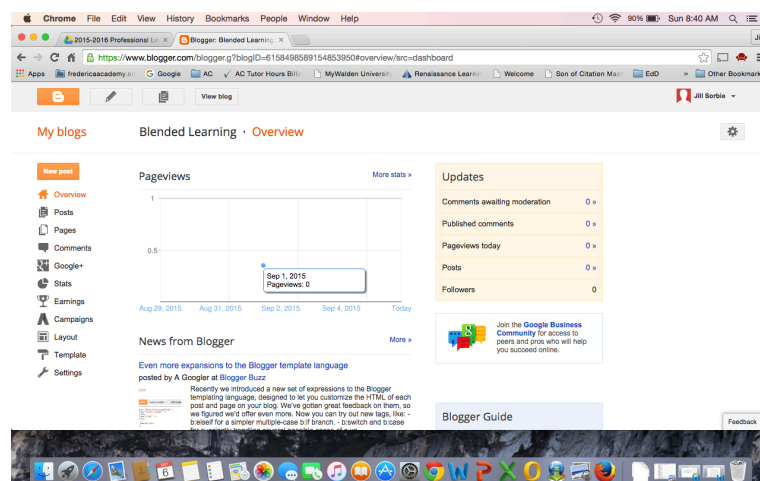
7. Finally, there is a blogger *Help* tab to assist you in any capacity.
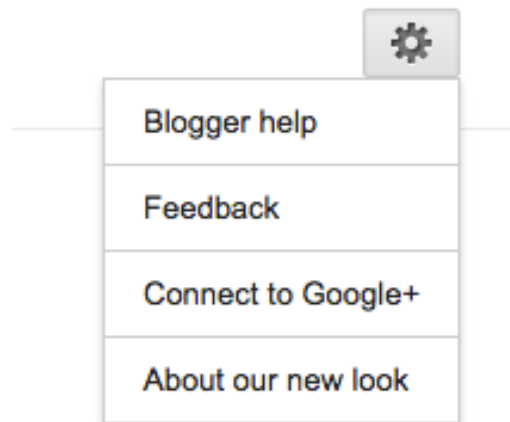


8. Have fun with blogs.  Think of the various ways Blogger can be used in your curriculum.

# Employing Technology as an Instructional Tool

### March Evaluation Form for PLC Meeting (Blog Tool)

Activity date: _____

This evaluation will provide data on the effectiveness of your group's PLC meeting. Please take a moment to complete the questions and return the form to your group's facilitator. Thank you for your immediate feedback.

1. The objectives of today's session were clear.

   <div style="text-align:center">1  2  3  4  5</div>

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

2. Materials were easily understood.

   <div style="text-align:center">1  2  3  4  5</div>

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

3. Discussions surrounding blogs were valuable.

   <div style="text-align:center">1  2  3  4  5</div>

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

4. The PLC session inspired you to use blogs.

   <div style="text-align:center">1  2  3  4  5</div>

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

5. The PLC session allowed you to create a blog.

   <div style="text-align:center">1  2  3  4  5</div>

   Strongly Disagree ◯ ◯ ◯ ◯ ◯ Strongly Agree

Other comments:

**April**

The focus for the month of April is still on utilizing blogs. For this hour-long meeting, faculty will reflect on the impact of blogs on teaching and learning by discussing four open-ended discussion questions on the disclosed handout. The four discussion questions are as follows:

1. How did blogs promote student learning?

2. What were the benefits and challenges of using blogs for both the students and the teacher?

3. How did blogs impact teaching and learning?

4. How did the online component (i.e. blogs) correspond to the offline component of your curriculum?

Afterwards, the group will work collaboratively to create a new blog task. The faculty is encouraged to collaborate and design a new way to utilize blogs. After the meeting has commenced, group members will complete the short survey reflecting on the effectiveness of the meeting.

# Employing Technology as an Instructional Tool

## April PLC Meeting

April:  PLC Meeting on Integrating Blog

Time: 1 hour

Desired Outcomes/Objectives

By the end of the session, participants will:

- Discuss how blogs impacted teaching and learning.

- Design a task to integrate a blog into their curriculum.

Training Material or Resources

- Sign-in Sheet

- Teachers' laptops

- Handout April PLC Meeting on Blogs

- Handouts on Blogger developed for teacher leaders

- Web tools – www.blogger.com

- April Evaluation on PLC Meeting (Blog Tool)

Presenters

Various teacher leaders based on their indicated proficiency on the Teacher Survey on Technology Integration

# Employing Technology as an Instructional Tool

April Blog Sign-in Sheet

| Objective: | | Meeting Date: | |
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| Facilitator: | | Place/Room: | |

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# Employing Technology as an Instructional Tool

## April PLC Meeting on Blogs

**Handout: Discussion Questions on Integrating Blogs**

1.  How did blogs promote student learning?

2.  What were the benefits and challenges of using blogs for both the students and the teacher?

3.  How did blogs impact teaching and learning?

4.  How did the online component (i.e. blogs) correspond to the offline component of your curriculum?

Instructions:

Over the next month, you are encouraged to continue utilizing blogs as well as any other Web tools into your curriculum. The remainder of your PLC time is to work as a group to investigate a new tool or create a new blog for your curriculum.

# Employing Technology as an Instructional Tool

April Evaluation Form for PLC Meeting (Blog Tools)

Activity date: _____

This evaluation will provide data on the effectiveness of your group's PLC meeting. Please take a moment to complete the questions and return the form to your group's facilitator.  Thank you for your immediate feedback.

1. The objectives of today's session were clear.

    1  2  3  4  5

    Strongly Disagree ○○○○○ Strongly Agree

2. Discussion questions were clear and thoughtful.

    1  2  3  4  5

    Strongly Disagree ○○○○○ Strongly Agree

3. Discussions surrounding the impact of blogs were valuable.

    1  2  3  4  5

    Strongly Disagree ○○○○○ Strongly Agree

4. The PLC session inspired you to use blogs.

    1  2  3  4  5

    Strongly Disagree ○○○○○ Strongly Agree

5. The PLC session allowed you to create a new blog.

    1  2  3  4  5

    Strongly Disagree ○○○○○ Strongly Agree

Other comments:

**May**

      In May, the high school faculty should meet as a large group to understand the effectiveness of the PLC.  The faculty should have received and completed the final technology integration survey to determine how the integration of technology has impacted teaching and learning including the potential change in practice.   At this final PLC meeting for the year, the administration should reveal the survey results.  These results should include all the data collected monthly from the surveys as well as the pre and post technology surveys.  The district should disseminate how they will move forward in the coming year in regards to PLCs and technology integration to successfully integrate the blended learning approach.

# Employing Technology as an Instructional Tool

## May PLC Meeting

May: Wrap-up Survey

Time: 30 minutes

Desired Outcomes/Objectives

By the end of the session, district and/or participants will:

- Understand the effectiveness of the PLCs for the year.

Training Material or Resources

- Sign-in Sheet

- Post Teacher Survey on Technology Integration

Presenters

Director of Curriculum and Instruction or Director of Research and Evaluation as well as the high school principal, co-presenters

# Employing Technology as an Instructional Tool

May Data Day and Wrap-up Sign-in Sheet

| Objective: | | Meeting Date: | |
|---|---|---|---|
| Facilitator: | | Place/Room: | |

| Last Name  [print] | First Name [print] | Department | Signature |
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**Post Teacher Survey on Technology Integration**

Name _____          Department _____

**1. Promote, support, and model creative and innovative thinking and inventiveness using digital tools and resources.**

1    2    3    4    5

Extremely Rare/Never  ◯ ◯ ◯ ◯ ◯  Always/Most of the Time

**2. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources.**

1    2    3    4    5

Extremely Rare/Never  ◯ ◯ ◯ ◯ ◯  Always/Most of the Time

**3. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.**

1    2    3    4    5

Extremely Rare/Never  ◯ ◯ ◯ ◯ ◯  Always/Most of the Time

**4. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.**

1    2    3    4    5

Extremely Rare/Never  ◯ ◯ ◯ ◯ ◯  Always/Most of the Time

**5. Design or adept relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**6. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**7. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**8. Provide students with multiple and varied formative and summative e-assessments and use resulting data to inform learning and teaching.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**9. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ◯ | ◯ | ◯ | ◯ | ◯ | Always/Most of the Time |

**10.** **Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**11.** **Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**12.** **Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**13.** **Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**14.** **Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**15.  Participate in local and global learning communities to explore creative applications of technology to improve student learning.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**16. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**17.  Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

**18.  Regularly implements a variety of digital tools into your lessons.**

|  | 1 | 2 | 3 | 4 | 5 |  |
|---|---|---|---|---|---|---|
| Extremely Rare/Never | ○ | ○ | ○ | ○ | ○ | Always/Most of the Time |

Adapted with permission from Chambersburg Area School District.

**Conclusion**

This PLC is designed to assist teachers in planning, sharing, and acquiring the knowledge and skills to effectively integrate Web tools, like Socrative, Thinglink, or Blogger. Each month throughout the 2016-2017 school year is designated to implementing various Web tools. For the PLC's monthly meetings, there are handouts to support the teachers as well as sign-in sheets and surveys allowing the administration to gauge the effectiveness of the PLC.

In September, an overview of the purpose, goal, and objectives of the PLC will be disclosed. Teachers will also complete a survey outlining their technology integration abilities. The results of this survey will allow administrators to successfully disperse the faculty into PLC groups.

In October and November, PLC groups meet to discuss why the faculty should use e-assessments and the difference between formative and summative e-assessments. To initiate the discussions, four open-ended discussion questions are provided. These discussions serve as motivation and validation for using e-assessments. Furthermore, the teachers learn about two e-assessment tools to create their own e-assessments.

In January and February, the PLC focuses on PBL. Again, handouts are provided to provide discussion points and serve as a resource for implementing PBL. Teachers learn a PBL tool and design a PBL task.

March and April emphasizes using blogs in the classroom. Blogs foster increased collaboration, communication, and the sharing of knowledge. In addition to the

discussion questions, teachers are provided resources to learn about a blog tool enabling them to establish one for their course.

May is devoted to disseminating the effectiveness of the PLC by using the results of the pre and post Teacher Survey on Technology Integration as well as the monthly surveys on the individual PLC meetings. This information validates the time spent and provides a general understanding of the growth of the faculty. Furthermore, district administrators should use this information to outline how they will move forward in the coming year in regards to PLCs and technology integration to successfully integrate the blended learning approach.

In summary, PLCs allow teachers to collaborate, share, and gain knowledge to increase their use of Web tools (Davies, 2011; Kenney et al., 2010). Moreover, they will discuss the benefits and challenges and in general support each other to improve their instructional practices. As a result, the leaders' desire to implement the blended learning approach will become more commonplace, and the impact to deliver a personalized education by preparing students for the future will be enacted.

Appendix B: Initial Contact Email

Dear _____,

Hello.  My name is Jill Sorbie.  I am a student at Walden University and am

conducting research as a capstone to completing my doctorate in education. The purpose

of this research project is to explore how teachers who use blended learning perceive that

it influences their teaching practices and assists students in the learning process.  As part

of this research purpose, this project study will explore teacher perceptions about the

successes and challenges of blended learning, including how Moodle is used as a tool for

formative e-assessment.  The results of this study will potentially identify the specific

components of Moodle and various technology tools that assist teachers in addressing

student learning outcomes.  I have selected your district because of the use of blended

learning and the learning management system (LMS) Moodle.  Your name has been

provided to me as a potential participant by your technology integration specialist based

to the following criteria:

1.  The content area teacher must use the district's LMS and other Web 2.0 tools.

2.  The content area teacher must use the blended learning approach at least three

times per week.

If you choose to be a participant, I will ask about 60 minutes of personal time from you,

and you will be provided with a $25 gift card for being a participant.  You will complete

six questions from an initial questionnaire and participant in a 30 to 45 minute interview.

You will also be observed using the blended learning approach on three separate

occasions and have a willingness to provide screenshots that document the use of blended

learning, The information you provide will be kept confidential and secured in a safe place for five years upon, which it will then be destroyed. I promise anonymity by assigning your name to a participant number, which will be used throughout the study, and I will never discuss your answers with anyone. Furthermore, I pledge to disturb or disrupt as little as possible. You may at any time choose not to take part in the study or refrain from answering a question. Your participation in the study is voluntary and will have no impact on your employment with the district.

The results of the study will provide the district insight into how teachers are utilizing the blended learning approach along with the LMS Moodle. In addition, the study will present the successes and challenges with integrating technology. This information could prove useful for future training.

I greatly appreciate your time and promise not to overburden you. To reflect my appreciation of your time, I will provide you a $25 gift card to Target. I hope you will consider being a participant in this study. Please send me a response via email by signing the attached consent form. If you have any questions, I am available at XXX.

Respectfully,

Jill Sorbie

Appendix C: Teacher Questionnaire

Name _____

1. How do you use the blended learning approach in your teaching practice?

2. How do you have your students incorporate technology into their learning?

3. How does blended learning assist in your teaching and student's learning?

4. How has professional development training or your course work assisted you to incorporate technology into your teaching?

5. Please explain how do you use your learning management system Moodle?

6. What technology tools do you use or your student use to support teaching and learning?

Appendix D: Classroom Observation Checklist

Teacher's Name _____     Observation Date _____

Observation Start Time _____     Observation Finish Time _____

Grade Level of Students _____     Content Area _____

Number of Students _____

Description of Classroom Environment:

| Description of Observed Activities | Personal Reflection |
| --- | --- |
|  |  |

Observe the teacher, circle Y for "Yes" and N for "No" if the items or concepts is occurring, and make comments regarding teacher behavior.

| Teacher's Behaviors | Yes or No | Notes (additional area on the back) |
|---|---|---|
| Teacher's lesson encourages students to use technology. | Y   N | |
| Teacher's lesson uses the school's LMS - Moodle. | Y   N | |
| Teacher's lesson uses technology as a tool for formative assessment. | Y   N | |
| Teacher's lesson uses online quizzes as a tool for assessment. | Y   N | |
| Teacher provides feedback to students using technology. | Y   N | |
| Teacher's lesson uses technology to support the learning objective(s). | Y   N | |
| Teacher's lesson encourages collaboration by using technology. | Y   N | |
| Teacher's lesson encourages individualization by using technology. | Y   N | |
| Teacher's lesson encourages online communication amongst the students. | Y   N | |

Additional Notes:

Appendix E: Protocol for Computer Screenshots

Teacher's Name _____ Observation Date _____

Content Area _____ Observation Time _____

One or more of the following qualifications must be met:

1.  Teacher's computer monitor displays a Web 2.0 tool used for assessment, collaboration, or communication among students.

2.  Teacher's computer monitor displays feedback to students.

Describe the screenshot and then place a check mark "✓" in the corresponding column.

| Description of Computer Screen | Shows E-Assessment | Shows Collabora-tion | Shows Communi-cation | Shows feedback to students |
|---|---|---|---|---|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Additional Notes:

Appendix F:  Interview Guide and Sample Questions

[Read to interviewee.] This research project is to explore teacher perceptions about how blended learning influences their teaching practices and assists students in the learning process.  As part of this research purpose, this project study will explore teacher perceptions about the successes and challenges of blended learning, including how Moodle is used as a tool for formative e-assessment.  The results of this study will potentially identify the specific components of Moodle and various technology tools that assist teachers in addressing student learning outcomes.  The information you provide today will be kept confidential and secured in a safe place for five years upon, which it will then be destroyed.  This interview will last between 30 to 45 minutes and will be recorded with your permission.

[Turn on computer recording software and test.]


Interviewee's Name _____

Interview Date _____

Interview Start Time _____          Interview Finish Time _____

Grade Level(s) Currently Teaching _____

Content Area(s) Currently Teaching _____

(Sample Questions)

1.  How is blended teaching different from face-to-face teaching?

        Follow-up probe:  Think in terms of planning, delivery, assessment, and student communication.

Follow-up probe:  How has blended learning impacted you as a teacher?

2.  Based on your experiences, how do you feel blended learning impacts the students?

Follow-up probe:  Can you cite some specific examples or lessons to help me understand?

3.  What affordances does the online teaching/learning environment have that the face-to-face teaching/learning environment does not have?

Follow-up probe:  Please explain some of your successes in implementing blended learning.  How did you get these to occur?

4.  Please explain some of the challenges or frustrations that your cope with when implementing blended learning.

Follow-up probe:  How do you overcome them?

5. On your questionnaire, you state you used _____ ICT tools, how do you feel these tool specifically assist you with blended learning?

Follow-up probe:  Can you cite some specific examples or lessons to help me understand?

Appendix G:  Data Alignment Grid

| Research Question | Data Collection Tools | Datapoints Yielded | Data Source | Data Analysis |
|---|---|---|---|---|
| List each research question (RQ) in a separate row below. | List which instrument(s) are used to collect the data that will address each RQ. | List which specific questions/variables/scales of the instrument will address each RQ. | List which persons/artifacts/records will provide the data. | Briefly describe the specific statistical or qualitative analyses that will address each RQ. |
| What are the teachers' perceptions of how blended learning influences teaching and learning? | Questionnaire and Interviews | Q 1, 3<br>I 1 | All participants | Answers from specific questionnaire and interview questions will be transcribed and methodically coded using Dedoose in order to identify emerging themes to answer this research question.  The established theoretical and conceptual frameworks found in the literature review will shape my analysis. |
| How do teachers use blended learning to assist students in the learning process? | Questionnaire, Observations, Documents, and Interviews | Q 2, 3<br>I 2 | All participants and documents | Individual responses to the questionnaire and interview questions will be coded according to mutually exclusive themes.  All four instruments will triangulate the data. Observation notes will be highly descriptive allowing for generalizations and themes to emerge. Documents will be coded according to specific themes – assessment, collaboration, communication, or feedback. |

| Research Question | Data Collection Tools | Datapoints Yielded | Data Source | Data Analysis |
|---|---|---|---|---|
| List each research question (RQ) in a separate row below. | List which instrument(s) are used to collect the data that will address each RQ. | List which specific questions/variables/scales of the instrument will address each RQ. | List which persons/artifacts/records will provide the data. | Briefly describe the specific statistical or qualitative analyses that will address each RQ. |
| What do teachers perceive as the successes of using blended learning for teaching and learning? | Questionnaire and Interviews | Q 1, 2, 3<br>I 3 | All participants | Answers from specific questionnaire and interview questions will be transcribed and methodically coded using Dedoose in order to identify emerging themes to answer this research question. The established theoretical and conceptual frameworks found in the literature review will shape my analysis. |
| What do teachers perceive as the challenges of using blended learning for teaching and learning? | Questionnaire and Interviews | Q 4<br>I 4 | All participants | Answers from specific questionnaire and interview questions will be transcribed and methodically coded using Dedoose in order to identify emerging themes to answer this research question. The established theoretical and conceptual frameworks found in the literature review will shape my analysis. |

| Research Question | Data Collection Tools | Datapoints Yielded | Data Source | Data Analysis |
|---|---|---|---|---|
| List each research question (RQ) in a separate row below. | List which instrument(s) are used to collect the data that will address each RQ. | List which specific questions/variables/scales of the instrument will address each RQ. | List which persons/artifacts/records will provide the data. | Briefly describe the specific statistical or qualitative analyses that will address each RQ. |
| To what extent do teachers use Moodle as a tool for formative assessment? If they don't use it, why not? | Questionnaire, Observations, and Documents | Q 5 | All participants and documents | Individual responses to the questionnaire will be coded according to mutually exclusive themes. Observations notes will be highly descriptive allowing for generalizations and themes to emerge. Documents will be coded according to specific themes – assessment, collaboration, communication, or feedback. |
| How do Web 2.0 tools assist teachers with blended learning? | Questionnaire, Observations, Documents, and Interviews | Q 6<br>I 5 | All participants and documents | Individual responses to the questionnaire and interview questions will be coded according to mutually exclusive themes. All four instruments will triangulate the data. Observation notes will be highly descriptive allowing for generalizations and themes to emerge. Documents will be coded according to specific themes – assessment, collaboration, communication, or feedback. |