7-2016

# Transformative Technology: Staff Perceptions, Attitudes, And Behaviors Related To The Use Of Learning Management Transformative Technologies

Misty McBrierty
*University of New England*

# Transformative Technology:
# Staff Perceptions, Attitudes, and Behaviors Related to the Use of Learning Management Transformative Technologies

By

Misty McBrierty

BA University of Maine, Farmington 1992
MS University of Maine, Orono 2004
CAS University of Southern Maine 2008

A DISSERTATION

Presented to the Affiliated Faculty of

The College of Graduate and Professional Studies

at the University of New England

Portland & Biddeford, Maine

May 18, 2016

Misty McBrierty
June 2016
Educational Leadership

# Transformative Technology:
# Staff Perceptions, Attitudes, and Behaviors Related to the Use of Learning Management Transformative Technologies

This qualitative case study examined how the perceptions, attitudes, and behaviors of staff relate to the effective use of transformative learning management technologies to support personalized/customized learning. Additionally, this study sought to understand the stories of individuals using the learning management system Empower as staff transformed to a personalized/customized culture. The conceptual framework focused on the disruptive technology necessary for personalized/customized learning.

Fifteen participants engaged in open-ended interviews, observations, sharing of artifacts, and the data was analyzed through coding transcripts into themes and summary concepts. The goal of the research was to analyze teacher experiences and perceptions using Empower to support personalized/customized learning.

Key findings of the research indicate that the effective use of Empower revolves around participant engagement, planning and experiences. One key finding of the research was that pre-work is critical to the success of technology in order to support effective use. A foundational first step must include ensuring a viable and valid structure of learning progressions for each content area, with attention to processes that take into account complex reasoning, and habits of mind and work.

The study also concludes that providing practitioners with deeply meaningful

learning experiences, personalized supports, and restructured planning time is crucial to sustainability and must be on-going.

It is essential that all practitioners have a solid understanding of instructional design in a blended learning model. Furthermore, time needs to be leveraged differently for practitioners and students. The time-based fixed structures limit the practicality of implementing all aspects of a personalized/customized learning model. The technology problems need to be rectified in a timely manner and better communication about technology use is essential. Teachers can't wait for days for the technology to be made functional. They are working live with students and need the technology to be up and running smoothly at all times.

Highly effective communication to all stakeholders, especially the parent/guardian group, is a critical need for the successful and sustainable impact of Empower or other learning management systems on personalized/customized learning. The role of leadership is foundational and essential to the implementation of Empower. Leadership, meaning from the board and superintendent level to the building level leaders and curriculum leaders, has to create the conditions for success of the practitioners and learners.

University of New England

Doctor of Education
Educational Leadership

This dissertation was presented
by

Misty McBrierty

It was presented on
May 18th, 2016
and approved by:

Carol Burbank, Ed.D, Lead Advisor
University of New England

Dr. Michelle Collay, Ph.D, Secondary Advisor
University of New England

Mary Morrison, M.Ed, Affiliate Committee Member

**Acknowledgements**

*"Today you are you! That is truer than true!*
*There is no one alive who is you-er than you!"*
-Dr. Suess

I would like to take a moment to say thank you to my family, friends, colleagues, professors, and cohort members. It is because of your support, strength, encouragement, courage, and patience that this dissertation is completed.

To my dissertation committee, thank you for agreeing to stand by me and assist me through this process. Your expert thoughts, amazing feedback, and willingness to stick with me until I found my voice and completed this dissertation has made it possible for me to contribute to the field of education.

To my cohort I am so thankful and grateful for your words of wisdom, feedback, encouragement, and models to help me with this challenging journey. Thank you Dr. Collay and Dr. Burbank for helping me accomplish my goals and sticking with me through the writing process.

To my family and friends for putting up with my frustration, time commitments, and times of being completely overwhelmed. You helped me through that and made it possible to complete this dissertation by giving me the space and time even at your personal sacrifice. Words can't express how grateful and appreciative I am.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

# CHAPTER 1

# INTRODUCTION

As the Western world has transitioned into the age of virtual web based interactions many public school students are still attending schools that deliver to the masses rather than personalized/customize learning. What are the barriers specifically at the K-12 level in transforming to a more personalized and innovative structure? Perhaps the primary barrier is an industrial era holdover that mandates time-based structures that prevent a personalized/ customized approach to public education. The most significant variable after leadership is the effective use of transformative technologies to support all stakeholders in the learning environment (Collins & Halverson, 2009). Organizations with strategic directions focused on the future conditions of living and economic success are moving toward a transformative vision that puts into place strategic design strategies that include the use of transformative technologies to support blended learning environments that allow learners to access learning 24/7 (Christianson, Horn, & Johnson, 2008). The study focuses on how teachers perceive the use of transformative learning management systems (specifically Empower LMS) as a way to reform and enable customized or personalized delivery of curriculum, assessment, and reporting of student learning.

## Statement of the Problem

Personalized/Customized, competency-based learning within K-12 public systems is an approach at the forefront of educational transformation with the fast paced, ever changing transformative technologies available (Sturgis, 2010). States such as New Hampshire and Maine have put in place innovative policy change to create a sense of urgency for this work (Bramante & Colby, 2012). The majority of public schools, however, are still struggling with shifting

paradigms and implementing structures that allow for personalized/customized, competency-based approaches to be used systemically and sustainably (McGarvey & Schwann, 2012). The reasons for the new delivery system implementation problem are diverse. The expectations of public school staffs include responding to mandates from federal and state levels for new standards and competencies for high school graduates and the publicity for producing graduates that lack skills for career and college readiness or 21st Century Skills. Given the challenges that educators face in creating personalized/customized, competency-based systems, how can staff engineer time, curriculum, instruction, and assessment through the use of technology approaches to promote this transformation?

**Purpose of the Study**

The purpose of this qualitative case study is to explore teachers' perceptions, attitudes, and behaviors related to the use of learning management transformative technology. The technology is the foundation of a blended learning environment to establish personalized/customized learning structures in rural, public, upper elementary classrooms.

**Research Questions**

Guiding this study examining the perceptions, attitudes, and behaviors associated with transformative technology used to personalize/customize learning, are the following questions: How does the transformative technology Empower Learning Management system impact the ability to implement structures to support personalized/customized learning?

How do teacher attitudes, perceptions, and behaviors impact the implementation of the technology for customized learning?

Sub-Questions:

(a) What do teachers describe as the essential aspects of a Learning Management System technology?

(b) How do the essential aspects of the Learning Management System support personalized/customized learning?

(c) What are the teachers' perceptions of the aspects of a Learning Management System technology that are difficult and not being used to support them in personalized/customized learning? Are there tools that could be more utilized?

(d) What are the teachers' perceptions of the essential practices in teaching and learning that impact the positive use of the technology in transforming to personalized/customized learning?

(e) What do the teachers identify as important professional learning supports and/or activities to integrate this technology into their practice?

**Conceptual Framework**

To adequately frame this study it is important to look at the theorists who inform the concepts that underlie personalized/customized learning. Personalized/Customized learning is defined as the capacity to customized learning to meet the specific needs and/or desires of the learner without adding significantly to the overall cost and workload for the system (McGarvey & Schwahn, 2012).

The structures that support customized learning are as follows: A future focused vision, strong guiding coalition (leadership), research based practices in curriculum, instruction, and assessment, policy to remove time based structures, and the use of transformative technologies

(Collins & Halverson, 2009; Cuban, 2012; Kotter, 2012; McGarvey & Schwahn, 2012). The goal of personalized/customized learning through transformative technologies is to accomplish the task of reimagining learning (Culatta, 2012). Transformative technologies provide a tool for learners to manipulate and apply knowledge and skill to gain a deeper understanding and mastery of the world and develop the skills of thinking and intellect (Papert, 1980). Tracking student competencies makes it possible for learners to make decisions about what to do next and to provide the learning coaches the ability to understand the learner's needs and interest to design effective instruction, provide in depth feedback, and give prospective employers or educator's specific information about the competencies attained in the field or program in a common way (Culatta, 2012).

A learner's motivation for learning is complex in nature and requires structures and systems that support the individual needs of all learners. According to drive theory, motivation comes when individuals are empowered, have a mastery of skills, and a strong sense of purpose for something greater than themselves (Pink, 2011). Empowerment through a mastery of knowledge and skills and sense of purpose provides engagement and innovation, while embracing a learner-centered culture. This is a key outcome of personalized/customized learning and the variable that will ultimately lead to student learning at higher depths of knowledge and mastery (Marzano, 2007).

*Sub-concept of Structures:*

The time-based structures in K-12 organizations such as Carnegie Unit, school day, school year, and seat time in courses, need to be addressed through policy and modifications should be done through local, state, and federal levels to ensure that learners have the time, pace, path, and space to meet the rigorous learning demands for 21st century life. These industrial age

structures, such as the Carnegie unit, are no longer productive in today's rapidly changing world as they constrict a learner's ability to go at their own pace vs. the pace based on a systemic policy (Sturgis 2010). The structures in the school day and year may meet the needs of adults but limit responsiveness to the needs of learners at every developmental level. The curriculum and instructional delivery system in a customized culture need to be based in research about teaching and learning while using transformative technologies to support the tracking of learning, access to learning 24/7, and instructional strategies that technology can support. Now that transformative technologies are available to provide the resources and tools for personalized/customized learning, in a competency-based system, the implementation of this model is practical, attainable, and sustainable (Collins & Halverson, 2009). The doors are open as transformative technologies change the face of how data are used to profile learners' needs, interests, ideas, and competencies and with this evolution of education redesign the concept of reimagining the delivery system is now an attainable vision. The technology is available now to design transformational learning experiences that are inexpensive, allow for learning to be the constant and time/pace that is learner driven leveraged by access and what Culatta calls "big data" (Culatta, 2012).

**Assumptions, Limitations, Scope**

The limitations of this study include the sample size and diversity. The sample comes from small K-8 schools that might preclude generalizing findings to larger organizations. The participant population is practicing regular elementary teachers and special education teachers. The findings associated with the perceptions, attitudes, and behaviors of these practitioners can be reflective of the larger group in K-12 education, but may not be generalizable.

As a researcher and supervisor to some of the participants in the proposed study I was diligent in ensuring my biases and assumptions do not impact the findings within the study. I have to utilize best practices in data collections and transparency to ensure the integrity and validity of the study results. These will be outlined further in the methodology chapter.

**Definition of Terms**

*Customization/personalization*: In business this refers to a large number of customers that can be reached simultaneously while meeting their individual needs (Davis, 1987). In education this is defined as meeting the needs of all learners simultaneously through interests, competencies, and individualized pacing via large data sets organized through transformative technology (Culatta, 2012).

*Competency Education*: Students advance on mastery. Competencies include specific, measurable, transferable learning outcomes at the creation and application level while developing skills and dispositions. Assessment is meaningful, timely, and embedded support for learning (Competencyworks.org)

*Blended Learning*: Through online learning, with some elements of student control over time, place, path, and/or pace and part of the supervision in brick-and-mortar location and the learning paths within the content/course are connected to integrated learning experience (Christensen, 2008).

*Instructional Design*: is an organized process that includes steps of analyzing, designing, developing, implementing, and evaluating instruction. The process usually includes learner outcomes, learning context, designing learning experiences and how outcomes are to be learned, authoring and producing instructional materials, implementing and using materials and strategies and evaluating the adequacy of the instruction.

*Industrial Age Education Delivery System/Time-Based*: This concept, in reference to the Carnegie unit which 120 hours of class or instructor contact over a year at high school level, includes curriculum, programs, teaching, assessment, and student placement by features of the factory assembly line, with everyone doing the same work, the same time, and in the same way (Spady, 1998)

*Transformative Technology*: Transformative technology enables new organizational structures and changes the way people work or the very nature of a field itself and are disruptive (Papert, 1980). They have the power to rapidly make traditional tools and processes obsolete (Collins & Halverson, 2012). These technologies by design disrupt the industrial age learning structures by changing the nature of the work through access to learning 24/7, removing time-based structures, allowing for much more access to big data to make decisions, and providing a vast variety of ways for students to engage in learning through interests and strengths. Technologies remove the need to rely on brick and mortar learning frameworks.

*Twenty-First Century Skills*: The term 21st century skills refers to a broad set of knowledge, skills, complex reasoning (knowledge utilization, analysis, comprehension), work habits (leadership, responsibility, communication), and habits of mind (perseverance, self-direction, self-reflection, growth mindset, adaptability, intuition), that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today's world, particularly in collegiate programs and contemporary careers and workplaces. Generally speaking, 21st century skills can be applied in all academic subject areas, and in all educational, career, and civic settings throughout a student's life.

*Implementation:* This is the process of putting a decision or process into effect

*Innovation*: Ideas and approaches that shatter the performance expectations of today's status quo; to make a meaningful impact, the new idea or solution must also reach a scale that serves millions of consumers and improves a product, process, strategy or approach (Culatta, 2012)

**Significance of Study**

This study will contribute to the understanding of how upper elementary teachers or learning coaches perceive the use of technology in personalized/customization of the learning delivery system and their role as agents of this transformation and implementation.

The idea of reimagining learning and creating a learning environment and culture that supports all learning needs by using technology can be daunting to the K-8 level of education. The strategies used to organize and implement a new delivery system will support other teachers at this level to frame the processes and strategies to implement this education redesign.

## Conclusion

K-12 public educational organizations are still marked by structures designed to maintain industrial age status quo. Many of the constituents within educational organizations, such as teacher's unions, are working against the transformation of structures that might meet contemporary needs. This barrier to progress is evident when organizations negotiate contracts and link productivity to time-based structures. The industrial age model of schooling includes time-based constraints that reinforce inequity for learners and may limit empowerment of learners and teachers within the system to transform structures, instruction and assessment strategies, and allow for individualized paths to competency. The educational systems of delivery need to change to meet learner's needs, interests, and prepare them with the skills and knowledge for the future living conditions. Transformative technologies are the critical component for

providing the time, the personalization/customizations, and the empowerment of the organizations constituency that allows for equitable access to learning.

# CHAPTER 2

# LITERATURE REVIEW

The research findings and theories in the areas of transformative technology, learning and drive theory, blended learning, and customization in the area of business management and higher education are all key areas in the study of personalized/customization in K-12 levels of education. The first of part of the literature review defines mass customization in learning and business, discusses the individual components of this model, and how they are correlated in business management and higher education settings. The second part of the literature review provides the theoretical bases for the study with a summary of the theories that emphasize the importance of the combination of blended learning using transformative technologies and effective pedagogy to implement the personalized/customized model in K-12 schools.

## Mass Customization in Business and Education

The notion of mass customization began in the business setting and is now prevalent in K-12 education. To define mass customization one must look at the perspectives of business management and learning theory. In the late 1980's the inception of mass customization strategies in business gained a lot of steam as business leaders wanted to find ways to gain greater access to their customers and become more competitive. The study, *Competing through Customization*, demonstrates that being competitive through recognizing that the customers' increasingly diverse needs makes the customization strategy imperative. Mass customization is defined as "treating customers as unique individuals in offering products and services" (Hong, Liao, Sturman, & Zhou, 2014, p.128). According to the field of business, customization provides more quality to the customers and a closer fit to their needs, therefore the customers

find more value in the products and services. The company gets more overall economic gains from this model without costing the customer more.

A study done by MIT researchers found the key to mass customization is aligning an organization with its customers needs. It is about being in a place where the company knows exactly what customers need and wants and giving them those things with an individualized approach while not increasing the cost to the company or the customer (Salvador et al., 2009). This is considered a tailored approach. Bea McGarvey and Chuck Schwahn define customization as, "the capacity to routinely customize products and services to meet the specific needs and/or desires of individuals without adding significantly to the cost of the product or service" (McGarvey & Schwahn, 2012, p. 20). In their book they discuss mass customized learning as a vision by which to operate in educational systems as quoted here: "Customized Learning is happening when, we are meeting the learning needs of every learner every hour of every day, while simultaneously meeting the learning needs of every other learner, every hour of every day" (McGarvey & Schwahn, 2012, p. 25).

Jamie Anderson's study on customized executive learning defines the idea of mass customized learning as the way professionals can receive outcome based training through virtual teams, and in integrated offerings that match the needs of the professionals not the needs of the company (Anderson, 2010). To understand what mass customization is and how it can be defined within the educational setting, it is important to look at the literature on the components of personalized/customized learning and how they are being implemented in organizations at the forefront of utilizing this model.

The components of personalized/customized learning need to be combined and work in synergy to ensure that the learning culture of personalizing or customizing learning for students

is successful. These components include transformative technology, blended learning structures of effective instruction, assessment practices, learning goal- and progressions-based curriculum, and competency based reporting structures and transformation of time-based structures. When transforming any system, the critical three components to address are time, reporting, and technology.

**Curriculum and Assessment Reform that Supports Personalized/Customized Learning**

It is important to review customized/personalized-learning definitions to de-mystify the misconceptions that educators, students, and parents might have about this vision of education. It is critical to know what customized or personalized is and is not. It is not all students working on the same learning goals at their own pace. It is not differentiated instruction where all the same age level students are in a class and the teacher groups them based on instructional goals (Demski, 2012).

Personalized/customized learning encompasses personalized instructional goals, with flexibility in content and pedagogy, and is specific to the student's interests and learning styles (Culatta, 2012). In this model the student is the center of the learning and instructional planning, not the teacher. This means that students will have access to text and hands-on materials at school, access to support from highly qualified people, and 24/7 access through technology to learning communities, social networks (peers & people with common interests), experts in any field, information and data, tutoring, productivity and knowledge building tools, and instructional and assessment tools that provide timely and specific feedback (Demski, 2012). For a personalized/customized-learning model to work, the students' use of technology to customize their own learning is imperative. Teachers have too many students to easily individualize instruction, and technology can integrate all the variables and information about a student and

assist them in making the next step decisions in their own learning (Demski, 2012). The habits of mind skills associated with self reflective and directed life long learning becomes part of the learner outcomes and is an integral part of curriculum planning.

Personalization/customization is self-paced, driven by assessment data, and has the ability to adapt to students' interests, needs, backgrounds, and learning styles (Demski, 2012). Using technology as a vehicle for information gathering and decision making about the learning needs and then the individual student paths will be suggested to them through the technologies ability to collect and aggregate big data, much like Amazon, I-Tunes, and Netflix (Culatta, 2012). With technology and policy in place to remove time-based structures and allow students access to learning 24/7 they actually move faster through learning goals than ever before but with support and engagement that keeps them motivated to want to learn and to gain mastery (Demski, 2012).

As Larry Cuban cautions educators, it is important to find balance in personalizing/customizing the delivery of instruction to meet the needs of diverse learners to ensure that they have access to learning. The values society and practitioners hold in education reform are the foundation of change (Cuban, 2012). In the era of highly rigorous standards of learning it has become very clear that in order for students to access learning to build their talents in preparation for jobs that don't even exist yet, educators must provide an experience that allows for learners to choose the path, pace, time, and space for learning to meet these demands. However, there are competing values that get in the way of progress in transforming education to a personalized/customized culture of learning (Cuban, 2012). Those values either perpetuate time-based structures of the industrial age that are school-centered or they promote learning outcome-based structures of the information age that are student-centered. Learning

environments have to promote complex reasoning, life-long habits of mind, and knowledge integration to solve authentic problems. Higher education and the world of work expect that students coming out of K-12 programming are problem solvers, innovators, and creators. The structures in place currently reinforce an old dilemma that hinders development of student-centered learning environments. It is difficult for systems to be fully responsive to students in the current educational climate K-12 as the high stakes testing and grade-level structures force all students to learn the same way at the same time, which is impossible and goes against all the literature on learning and drive theory. Given this situation, it is helpful to review the literature to see what is working in customization so organizations can begin to move forward (McGarvey & Schwahn, 2012).

In all levels of learning there are going to be differences in knowledge and skill sets of the learners. In a study done on customizing content delivery for a statistics course in graduate management education, it became clear that in these rigorous majors that may not have requirements for prior degrees, caused a gap in understanding that required specialized learning (Hall & Ko, 2008). The suggested components coming from this study were: to find or develop a rigorous screening tool to identify learning needs, technology that is responsive to learning needs based on the assessments, and effective pedagogy of core instruction (Hall & Ko, 2008).

The study focused on statistics learning outcomes for business education, as it is a critical area of content that needs to be mastered in order to have success in future content in the business program. This is an interesting component as we know that there are critical learning progressions that need to be followed in all areas of learning and having effective screening tools to assess the vital signs of learners and plan accordingly is a foundational structure that has to be

working well in order to choose the most effective strategies and learning paths for learners to succeed through a system (Marzano, 2007).

This brings back the idea that personalized/customized education must include online remedial work and assessment tools that generate data in real time, so that those knowledge gaps that prevent higher level learning goal attainment can be addressed effectively.

**Instruction and Assessment**

One role of assessment is feedback and is critical to a personalized/customized-learning environment. It has to be descriptive, timely, and meaningful (Kim, 2012). Kim's study on the affective and motivational factors in providing feedback in personalized learning environments addresses the instructors' support of students specifically in online remedial math courses (Kim, 2012). Post-secondary college programs admit students who need remediation in mathematics and language acquisition, and one approach to more efficient remediation is through online instruction to close those gaps. Many of the students who are in these courses have experienced failure in school and therefore enter post-secondary programs with low motivation and self-efficacy (Kim, 2012). One of the components of the technology used in Kim's study is virtual change agents. These are virtual supports that respond to student needs in the moment and then personalize instruction accordingly based on the assessment data in the critical moment it is needed. This kind of feedback and course correction provides students with feedback about what they did well, what is needed to improve, and their next steps. Students getting this feedback and who have use of adaptive technology overcame difficulties far more easily as they progressed through the remedial course. Kim explains the importance of not only designing courses that address motivational needs of engagement and purpose but that also address the emotional needs of the learner to support student perseverance in a virtual

environment. A personalized/customized learning environment has to promote autonomy, competence building, and relatedness (Kim, 2012).

In 2010 the Nellie Mae Education Foundation asked Susan Patrick and Chris Sturgis to audit the area of competency-based pathways for education. The report published is *When Success is the Only Option: Designing Competency-Based Pathways for Next Generation Learning*. In this report the critical components of competency-based pathways are discussed. The premise behind competency-based pathways is the personalization/customization of learning to meet competencies through choice of path, place, time and space (Sturgis & Patrick, 2010). Sturgis and Patrick describe the three design principles that allow for customization.

The first design principle is the idea that students advance upon mastery of learning, not because they are a year older. They work at assessed level of instruction and at the appropriate levels of rigor. Students are evaluated on their performance only and credits earned by students are based on mastery not seat time.

The second design principle is creation of explicit and measurable learning goals that empower students. In this venue, teachers change from having the central role to be the learning engineer or coach of the learning. The unit design changes to learning progressions that are put together in modules and the learning expands beyond the classroom setting with formal and informal learning opportunities in and out of the classroom.

The third design principal is the idea that assessment is purposeful and for learning. Formative assessment aligned to learning goals with immediate descriptive feedback that is collected over time and combined with summative assessment feedback to ensure mastery of material. This third design principle is critical and where educators must spend a great deal of time creating the formative assessment tasks and summative (end of learning) experiences that

focus on the skills, knowledge, and concepts with multiple ways students can access and show mastery of learning. The idea is that grades are not the focus but the amount and level of rigor of the evidence collected and triangulated is the measure of competency attainment. All assessments, especially summative ones, are adaptive and timely. They should only come when the student is clearly ready based on all the formative work done prior to the summative assessment (Sturgis & Patrick, 2010).

Sturgis and Patrick also discuss the idea that education must transform in order to overcome the inequities for students in accessing learning and the time to master the skills and knowledge (Sturgis & Patrick, 2010). Like McGarvey and Schwahn (2012) claim, if educators are to meet the needs of all students, they have to address the limitations of a time-based system of education.

Innovation in the field of education can't happen without these weight bearing walls being torn down while the structures to support students choosing their own path, pace, time, and space to learn are put in place (McGarvey & Schwahn, 2012). The research about student motivation and learning is abundant and Sturgis and Patrick bring these concepts to light when discussing this innovative, transformative idea of personalized/customized, competency-based learning. Educators can't keep accelerating some students while leaving others who are always chronically behind by not having mastered the learning (Sturgis & Patrick, 2010). As the experts in the field have been telling us for decades, the Carnegie Unit, grade levels, seat time, school day and year, student information systems, and curriculum overload, do not promote learning, motivation to learn, or mastery of skills and knowledge. These structures do just the opposite (Black & Wiliam,1998; Davies, 2007; Marzano, 2007; McGarvey, 2012; Reeves, 2011; Stiggins, 1997; Wormeli, 2006).

Another insight about motivation and learning that Sturgis and Patrick discuss is the demand for personalized/customized, competency-based approaches. Transformative technologies support some online learning through learning management systems to provide access, expansion of time, and individualization. There are many pathways to graduating from high school that allow the removal of seat time from the system (Sturgis & Patrick, 2010). The costs of time-based structures are not as effective as competency based, blended learning pathways. The other important component is that time based structures do not allow access to our most under resourced learners and schools. Moving to a personalized/customized model will remove those inequities (Sturgis & Patrick, 2010).

Innovators in the field of personalized/customized, competency-based learning, also know that where students enter into the learning experience is important. Starting points should be based on individual needs. If the learning goals are organized in progressions of learning from K-12 with more effective practices in the classroom, school design, technology integration, in conjunction with effective assessment tools, students can enter the learning by their level of achievement and interests, and not by their age (Sturgis & Patrick, 2010). Policy has to change as well in order for the customizable learning entry points to be successful.

**Sustainable policy recommendations**

The keys to success for a fully sustainable personalized/customized learning system according to Sturgis and Patrick are as follows. First, effective state policy frameworks have to be created, adopted, and implemented. States need to waive the Carnegie unit and give credit for mastery of skills and knowledge in personalized/customizable pathways. The second key factor is knowledge and skills are assessed at the application level through performance assessment (Sturgis & Patrick, 2010). Marzano's learning goals and proficiency scales are excellent tools

for creating these learning outcomes and proficiency levels as the lens to collect and evaluate the evidence of learning at the targeted level of proficiency (Marzano, 2007).

The third key factor is the opportunity for teachers to teach and students to learn in a personalized/customized environment. Teachers will engineer online and face–to-face coaching, which supports students moving from one learning goal to the next and reaching the targeted mastery, not just simply experiencing an activity or assignment. The focus becomes learning not activities and assignments completed on time (Sturgis & Patrick, 2010). The fourth key factor is cultivating a culture of continuous improvement. With a personalized/customized approach both teachers and students are continuously reflecting and focusing in on formative assessment feedback. The idea of social promotion no longer exists in this culture but rather the pathway to learning and mastery of skills is the promotion criteria (Sturgis & Patrick, 2010). The final key factor recommended is community engagement early and often. This seems to be a harder task than one might think but critical to ensure that communities understand the approach and start the process in the early grades to avoid issues with high school graduation (Sturgis & Patrick, 2010). To summarize, the policy changes should include changes in the seat time, which include; removal of the Carnegie Unit, change in school calendars and school days. Also, changes in competency or proficiency based policy that would support better reporting of student competency attainment and data collection.

There is a wealth of knowledge around meeting students where they are in a personalized/customized culture of education, especially at higher education levels. In reviewing research and reports around learning theory, drive theory, customization, personalization, blended learning, transformative technologies, and educational practices meta-analysis reports, it is clear that McGarvey and Schwahn have itemized the weight-bearing walls that prevent student

learning in a culture of empowerment. McGarvey and Schwahn say these WBW's are as follows: Grade levels, student assigned classrooms, class periods/bell schedules, courses/curriculum, textbooks, lack of technology use, ABC grading, report cards, learning only happening in schools, and nine-month school year. All the experts agree these are structures that prevent customized learning, so what does that mean for schools? It begs the question of, how important is the leadership in transforming the system from the ground up (McGarvey & Schwahn, 2012)?

**Leadership in the Age of Personalized/Customized Learning**

Transformative change requires leadership that has a strong moral compass, has built high levels of intellectual and social capital (Fullan & Hargreaves, 2012), is able to empower those in the organization to improve, innovate, and create, and has the strength to stand for social justice even when it is not popular and faces great adversity (Fullan, 2007). Personalized/ customized learning is a transformative change that stands in the face of industrial age structures that are protected by unions, policy makes, and communities that have not embraced the transformative technology available for the personalized/customized age of education.

Kotter (2012) describes the eight stages of creating a new method of operating that includes establishing urgency, creating a strong guiding coalition, developing a vision and strategy, empowering employees for broad-based action, generating short term wins, consolidating gains and producing more change, and anchoring new approaches in the culture.

The personalized/customized learning vision requires what Schwahn & Spady (2010) call *total leaders*. These leaders are future-focused and have the courage to embrace the fact that the world has shrunk and we live in a 24/7 lifestyle with access to anything we want better, faster, smaller, and cheaper. Being a future-focused leader means being clear about the vision from the

start and recognizing that teachers are working very hard and want to be successful but are unable in the current structures to meet the needs of the learners or society (Schwahn & Spady, 2010). Leaders recognize it is important not to remove what works while reforming what doesn't, as research-based practices, accepted theory, experts, and successful experience should guide all decision while traditions, norms, convenience, and habit should not (McGarvey & Schwahn, 2012).

Leaders who embark on a transformative change such as personalized/customized learning should recognize that situational leadership is a necessity as leaders in any organization will be leading individuals with different needs, skills, and personalities. Hersey's situational leadership model explains how an individual might move in and out of delegating, supporting, coaching and directing (Hersey, 2012). Leaders in a culture of change have to empower individuals in the organization to solve adaptive problems and engage in innovative and creative cultures. Daniel Pink describes the motivation of individuals to engage in complex tasks and how leaders need to ensure that there is a clear sense of purpose; mastery of skills, and empowerment and then innovation culture will become a reality (Pink, 2011).

Kotter, Hersey, Schwahn, and Pink describe common threads that guide leaders in ensuring a highly motivated, dedicated, productive, innovative and creative individuals in organizations (Hersey, Blanchard, & Johnson, 2012; Kotter, 2012; Pink, 2011; Schwahn & Spady, 1998). If education is ever going to change, leaders must be highly skilled at understanding the strengths of the individuals in the organization, have a clear and well communicated vision so individuals have a strong sense of purpose, and allow those who are skilled and have the purpose to be empowered to solve the adaptive problems that need to be solved in education today to create a culture of innovation and creation. All experts in the field

of leadership know that carrots and sticks management tactics only work for menial tasks that require no thinking but if complex problems are to be solved and a successful transformation is to occur, leadership must transcend management and transform to leadership in an ever-changing world.

**Transformative Technologies that Support Customized Learning**

Collins and Halverson (2009) describe how transformative technologies are the seeds of a new educational system. The new educational system is customizable for the learners through transformative technologies. There are some important technology components that support personalized/customized learning and they are as follows: 1) a well implemented 1:1 laptop initiative, 2) learning management system, 3) access to online remedial learning, and 4) open access to search tools (Demski, 2012).

The transformative technology at the forefront of supporting personalized/customized learning is learning management systems that allow for virtual schooling and distance education. These technologies can organize the web 2.0 tools of gaming, video, and computer based learning materials that engage and enhance learning experiences. The collection of transformative technologies are what Christensen calls "disruptive innovations" that will disrupt class and force us to transform the way educators deliver learning to digital natives (Christensen, 2008).

In a study on holistic blended learning there is a discussion of the best LMS systems for blended learning and that schools should choose one that is customizable as some of the most popular LMS's may be a bad fit for blended learning. Some of these LMS's, such as Moodle, are not set up for customizable coding, which is imperative for a learning objective based education to be seamless in its implementation (Stone, 2008).

Web 2.0 tools include video making tools (I-movie, voice thread, movie maker, etc.) Youtube, wikis, presentation tools (i.e. Prezi), website productions tools such as Google sites, and many others. Google apps for Education and the new Google Classroom are beginning to put the web 2.0 tools in the same platform to make it easier to integrate all web 2.0 technology. In the study done on using Google drive to support a blended learning approach, the Google productivity tools of shared documents, blogging, web builder, calendar, and web 2.0 integration made the activities more authentic and allowed for a great deal of self-reflection and feedback to learners (Rowe, 2013). This technology as a stand-alone tool, however, has its limitations.

Another transformative technology for educators to use is social networking such as Facebook and Twitter. Digital natives are wired for social learning using technology resources. These can be incredible communication and productivity tools if used properly in the learning culture. Collins and Halverson discuss these tools and how digital natives in learning opportunities utilize these tools to learn and communicate already (Halverson & Collins, 2009). Richard Culatta discusses the idea of reimagining learning (2012) and focusing on the solutions technology provides to customize, provide feedback and analytics, empower learners, support the ability to adjust pace, and create creators (Culatta, 2012). The future of education can be leveraged by technology and bridge the divide between the industrial age use of technology and transformative use of technology to shatter the status quo and redesign learning experiences in the field of education. Seymour Papert, whom some would consider the father of instructional design with digital tools, talks about technology as the vehicle to which a student can learn to communicate mastery of the world and apply the technology to change it (Papert, 1980).

Along with use of productivity and communication transformative tools in the educational setting there is a need to collect data on student performance in a personalized/

customized way. In order for students to choose their path, pace, time, and space for learning there has to be technology available to collect the data on learning outcomes in real time and that is accessible from anywhere. Educators are seeing these transformative technologies emerging as companies are now realizing the need for this to occur. Learning management systems such as Blackboard, Canvas, Moodle, Schoology, Buzz and Educate are all working on data management tools within the learning management platform to collect the formative and summative feedback students are receiving in an E-Portfolio. This way, students receive customizable feedback and reports on their mastery of learning outcomes unlike report cards in a student information system, which does not allow for customized reporting. If educators are to meet the unique needs of learners then the reporting structures have to be set up in order to organize student outcomes in a personalized or individualized format, not in a standardized format. Teachers need these tools so their work is efficient, accurate, and streamlined. This is why learning management systems have far more potential than student information systems ever will in this regard.

In reviewing all the transformative technologies available and emerging, it becomes evident that the blended learning model is necessary in order to meet the needs of learners and utilize effective pedagogy in and out of the classroom setting. In looking at blended learning it is also important to connect and implement the best-fit transformative technologies to make this work. One cannot work in isolation of the other (Stone, 2008).

**Pedagogy to support Personalized/Customized Learning: Blended Learning**

The most common and accepted definition in both K-12 education and higher education of blended learning is the use of both face-to-face and online methods of instruction to meet the unique needs of learners. The idea behind blended learning is to use the web for what it does

best and use the face-to-face time for what it does best (Cherry, 2010). The holistic model for blended learning discussed by Alex Stone for use in K-12 cyber schools describes the approach as a whole new idea of learning outcomes (LO's) based instruction that is an alternative to the "off-the-shelf" courseware and "whole curriculum bundles" that are in the traditional brick and mortar classroom experience (Stone, 2008). Stone explains the idea that holistic blended learning is an alignment of curriculum around learning objectives that students can then select from and are delivered to them in both the traditional classroom and through a selection of online delivery through learning management systems (Stone, 2008). Stone also discusses the great advantage to public schools in moving to this model as it provides an opportunity to truly personalize/customize the experience for students. This can happen through the collaboration and synchronized development of processes in creating learning experiences and assessment options for students (Stone, 2008). The use of the best transformative technology integration for personalized/customized learning to be a sustainable and viable model is critical.

In business and management education research, many studies examine blended learning models. James Fleck's study on blended learning and learning communities looked at the increased prevalence of blended learning in business and management education and what opportunities and challenges as well as different models of blended learning in higher education have come from this approach (Fleck, 2012). Higher education is certainly at the forefront of distance and blended learning models especially in the business and management majors. Fleck's study found that the challenges were around costs, intellectual property rights, pedagogy of instructional delivery, and the preconceptions and perceptions of educators in the institutions (Fleck, 2012). These elements deserve consideration especially in the K-12 level of education, where cost is a very critical factor and budgets are tight. The appropriate resources for

technology and professional development must be in place for the blended learning model to be sustainable. Without proper training and support pedagogy and perceptions will also be compromised.

In a study done on educators' perceptions, attitudes, and practices in blended learning in business and management education, most educators saw the value in the blended learning model and were open to technology use. However, the biggest barrier was developing effective pedagogy of blended learning experiences (Benson, Anderson, & Ooms, 2011). Many educators found the process time consuming. If they didn't see the value in a particular technology or a teaching practice that needed to be changed, the mastery of learning outcomes by students was not significant (Benson, Anderson, & Ooms, 2011).

A study done on blended course design gave some great insight on the unique characteristics and best practices in blended courses, as they are different than just classrooms enhanced with technology or fully online programs (McGee & Reis, 2012). The best practices according to McGee and Reis (2012) are organized into the following categories: Variations in design and approaches, alignment of course components, moderation of interactivity and expectations, intentional classroom technology, and support for course redesign. The key recommendations that come from these categories, which connect to K-12 educational needs, are in the areas of constructing appropriate instruction and assessment tasks that fit both the performance based and knowledge based learning outcomes. These outcomes are housed in the learning management technology effectively for personalized/customized learning. As McGee and Reis (2012) state this has to be intentional on the part of the instructor. It is recommended that blended learning guides are created clearly to support an instruction on redesigning courses

for a blended learning model and include good examples of what this looks like (McGee & Reis, 2012).

Educational Testing Service put out a report called Teaching in the World of Virtual K-12 Learning: Challenges to Ensure Educator Quality (2011). In this study there are clear recommendations similar to the McGee & Reis study recommendations, and include case studies of model blended learning schools. This study also discusses the importance of strict online teaching competencies and standards, as systems move into a more technology based, blended educational model so this transition does not impact student achievement negatively (Natale, 2011). Natale (2011) points out that creating valid and reliable assessments in the digital medium needs to be addressed. A great deal of educator professional development is necessary for blended learning to be successful and sustainable in raising student achievement, engaging students, and focusing on learning objectives.

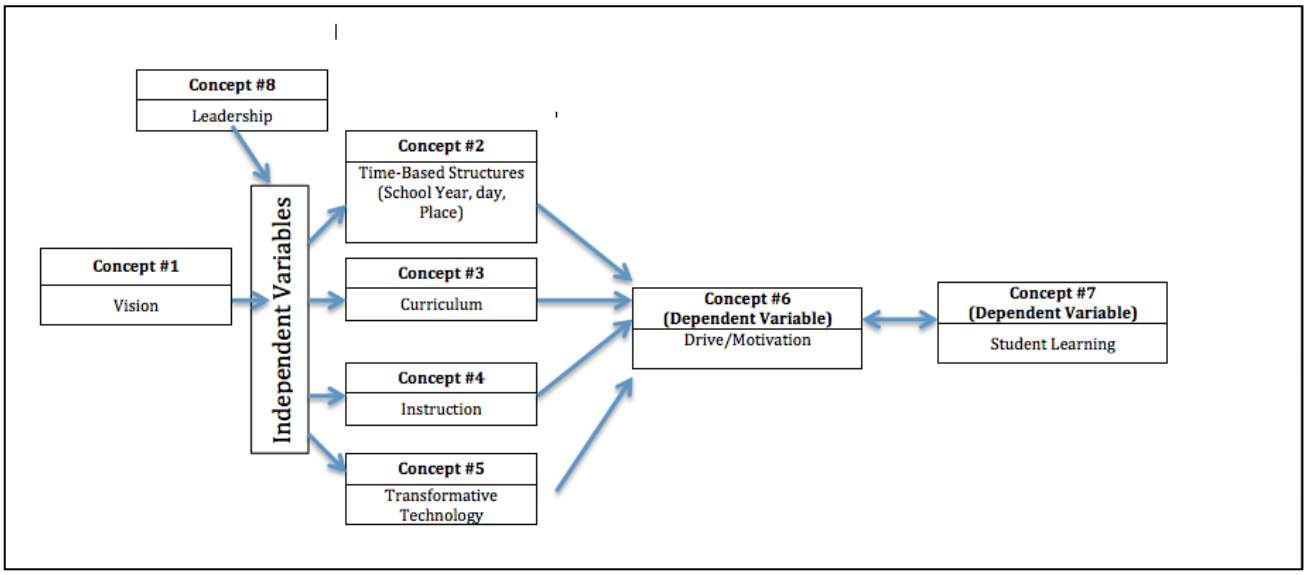
Blended Learning is certainly pervasive in the field of higher education and is now becoming more prevalent at the K-12 level. This model has the potential to transform education across all educational systems. The use of online and face-to-face learning can provide all students with access to learning that they may not have otherwise (De La Varre, 2010). Research suggests that it is the connection of transformative technology, blended learning pedagogy, and transformative leadership that will lead to a fully customized system of education across all levels, especially at K-12.

## Conceptual Framework

To adequately frame this study it is important to look at the theories of personalized/customized learning. Personalized/customized learning is defined as the capacity to customized learning to meet the specific needs and/or desires of the learner without adding significantly to the overall cost and workload for the system (McGarvey & Schwann, 2012). Students do not enter school unmotivated or lacking drive to learn. Early childhood is a time of curiosity and excitement for the unknown. Children engage in experimentation and challenge without the perceptions of sorting and categorizing, failure is negative, or that there needs to be some reward or punishment in the learning experience (Dweck, 2006).

The structures that support personalized/customized learning start with the critical components of a clear and strong vision for the organization, and transformative leadership leading the vision to reality. In conjunction with a vision and strong guiding coalition the removal of time based structures, learning goal-based curriculum, instructional strategies that work, and transformative technologies have to be in place to ensure that a student centered vision can become a reality (McGarvey & Schwahn, 2012).

*Figure 1.* Conceptual Framework




Learner drive (motivation) and learning are complex in nature and requires structures and systems that support the personal needs of all learners. According to drive theory, motivation comes when individuals are empowered, have a mastery of skills, and have a strong sense of purpose for something greater than themselves (Pink, 2011). In a personalized/customized learning culture empowerment of the learners and the learning coaches (teachers) is key to the success and motivation of all individuals in the organization.

The curriculum and instructional delivery system in a personalized/customized culture need to be based in best practices research of teaching and learning while using transformative technologies to support the tracking of learning, access to learning 24/7, and instructional strategies that technology can support. Learners should know what the competencies are to graduation and have an individualized path, pace, time and space to achieve these competencies (Sturgis, 2010). The technology will prove to be an essential component in a blended learning

environment and will ensure a student centered learning culture is established (Collins & Halverson, 2009).

The time-based structures in K-12 organizations need to be addressed through policy and this should be done through local, state, and federal levels to ensure that learners have the time, pace, and space to meet the rigorous learning demands for 21st century life. These industrial age structures, such as the Carnegie unit are no longer productive in today's rapidly changing world as it constricts a learner's ability to go at their own pace vs. the pace based on a systemic policy (Sturgis 2010). The structures in the school day and year meet the needs of adults but do not consider the needs of learners at every developmental level. By removing these structures and opening up opportunities in and out of the brick and mortar schools along with the use of technology, we can change the face of how learners can access learning opportunities and meet competencies (Colby & Bramante, 2012).

The purpose of this study is to explore and describe the individuals in K-12 organization's, perceptions, attitudes, and behaviors related to the use of learning management transformative technology that is the foundation of personalized/customized learning structures.

## Conclusion

Theorists, practitioners, and most importantly students support the personalized/customized learning vision. The primary goal of the literature review was to assess the current knowledge of the components of personalized/customized learning. The key questions and problems addressed in the research presented in this literature review include the need for transformations in the integration of technology, blended learning opportunities and challenges, customization in business and management fields of career and college, competency-based education opportunities, and challenges from the policy and leadership perspective.

These studies indicate that the quality of the teaching practices in the face-to-face interactions and online learning environments are key to the success of the blended learning models. The seamless integration of transformative technologies to engage and manage student learning are critical. The removal of time-based structures within the educational system is a key to the transformation of traditional delivery systems to personalized/customized delivery systems. The studies also show that leadership from policy makers to building level leaders is a non-negotiable for a massive transformative change like customized learning in K-12 systems.

The literature indicates a strong base in all the components of personalized/customized learning in the K-12 level of education. However, it does not have clear studies around the full process an individual system goes through in order to transform to a personalized/customized model. How do schools vision, strategically design procedures, protocols, budgets, and community involvement? What methods of assessing progress are used? How is the curriculum transformed from unit plans to learning progressions leveled K-14? How is all this managed using transformative technology? Though it is clear the components of personalized/customized learning, how do they all fit together to create a sustainable, customizable culture of learning in a K-12 system? What are the perceptions, beliefs, and barriers in transforming a system to customized education? How are teachers prepared to educate in a personalized/customized model?

# CHAPTER 3

## RESEARCH METHODOLOGY

This qualitative multi-case study approach will examine the perceptions, attitudes, and behaviors (strategies) of upper elementary teachers regarding the use of learning management technology that promotes personalized/customized learning in a blended learning environment, to maximize the teaching and learning experience. The data collected from multiple sources present information about specific teacher's practices in the integration of the learning management technology and the impact on the ability to promote more personalized experiences for upper elementary students.

The literature review contains multiple references in regards to the use of technology in classrooms and the positive effect on student learning and motivation (Collins & Halverson, 2009; Cullata, 2012; Marzano, 2009). Researchers cited suggest the use of specific learning management technologies is necessary to support successful execution of personalized/ customized learning structures. These structures provide learners and teachers with the information they need to make decisions about learners and learning needs and to access learning 24/7, while improving and influencing important complex reasoning skills including: (1) collaboration, (2) communication/social networking, (3) analysis, and (d) knowledge utilization (Christensen, Horn, & Johnson, 2008; Cullata, 2012; Kim, 2012; Marzano 2009). The research questions to be addressed in this case study include:

How does the transformative technology Empower Learning Management system impact the ability of teachers to implement structures to support personalized/customized learning?

How do teacher attitudes, perceptions, and behaviors impact the implementation of the technology for customized learning?

Sub questions:

(a) What do teachers describe as the essential aspects of a Learning Management System technology?

(b) How do the essential aspects of the Learning Management System support personalized/customized learning?

(c) What are the teachers' perceptions of the aspects of Empower Learning Management System technology that are difficult and not being used to support them in personalized/customized learning? Are there tools that could be more effectively utilized?

(d) What are the teachers' perceptions of the essential practices in teaching and learning that impact the positive use of the technology in transforming to personalized/customized learning?

(e) What do the teachers identify as important professional learning supports and/or activities to integrate this technology into their practice?

This chapter includes information about the (a) qualitative research methods and design, (b) rationale for qualitative case study, (c) setting, (d) participant selection, (e) data collection and analysis, (f) participant rights, and (g) limitations, biases, and ethical considerations.

The rationale for choosing this study method is its suitability for gathering perspectives and perceptions of the use of learning management technology. The goal of the study is 1) to understand a particular situation or program through the perspectives of specific users, 2) to uncover the variables of implementation of technology and, 3) to uncover the behaviors of the

participants in the study. The study will provide concentrated descriptions of experiences from the participants' perspectives (Merriam, 2009). Because of the need for thick description of experiences a quantitative study is not the best method for collecting data (Creswell, 2012).

**Setting**

The study sites are several small, rural upper elementary schools. Each of the elementary schools (grades 3-6) will be in rural areas of Maine and New Hampshire and have small class sizes (15-20 students) with less than 100 students per grade. The qualitative research design strives to put into context the use of learning management technology and capture and describe the successes and challenges from the perspective of upper elementary school teacher participants in a technology-rich environment. Each school site will have the following characteristics: technology-rich environment that includes devices for every student, learning management system accessibility, use of personalized learning structures, and professional learning time. In one of the 3 sites chosen, the researcher is an administrator and part of the implementation process of a new learning management system, which made the site practical and useful for the research study. The principal at the site is supportive of the study and the teachers are comfortable as participants. In the other sites the researcher has no personal connections other than inviting teachers to participate in the study. The goal of the study is to gather detailed descriptions from participants of their experiences and therefore it is important for the researcher to attempt to establish, build, and maintain positive rapport with the participants to ensure full access of information (Merriam, 2009).

## Participant Sampling and Stakeholders

The sample of participants, are from small, rural areas with no more than 15 participants across 3 small elementary schools. The participants include 3rd, 4th, 5th, and 6th grade classroom teachers and the building administrator. The sample sites provide some diversity in gender, class, and years of teaching experience within the selected schools offer a purposeful sample across the sites (Creswell, 2012).

The participants are all interested and invested in the use of devices and learning management system technology at their prospective sites. Their familiarity with technology is the same and all the sites are using the same learning management system called Empower. Participants received an invitation to participate letter and will receive a consent letter for the participation in interviews and surveys.

*Table 1.* Sample Breakdown

| Site | Participants | Sample Size |
|---|---|---|
| Rural NH School with student enrollment of 125 K-5. | 3, 4, 5, and 6th Grade Teachers (One per grade) and one building Principal | 5 participants |
| Rural ME School with student enrollment of 165 K-12 | 3,4,5, and 6th Grade teachers and one building Principal | 5 participants |
| Rural ME Charter School system with student enrollment of 135 K-8 | 3,4,5, and 6th Grade teachers and one building Principal | 5 participants |
| | Total Sample Size | 15 |

## Data

The goal of this qualitative multi-case study is to deepen the understanding of the factors involved in the use of transformative learning management technology in upper elementary classrooms through the perspectives of practitioners in the field. The data from multiple

qualitative sources include: (1) observations during the use of learning management technology, (2) open-ended interviews, (3) survey on instructional use of learning management system, and (4) analysis of artifacts (student work, team notes, team recommendations to leadership, virtual construction of lessons within the learning management system (LMS), recommendations to other teachers on the best practices for use of LMS). The culminating research will include detailed descriptions and transcribed interviews. In addition, the participants will review the transcripts and narratives for accuracy before the transcripts are coded to protect anonymity of the responses. The comprehensive collection of the data will contribute to the understanding of the use of LMS technology and identify patterns and themes to provide the implications this has for teachers in the field.

The specific methodology for the study is determined by the research questions. This study examines the how and why of transformative technology uses, specifically in terms of perceptions versus testing theories (Creswell, 2009). The data collection is dependent on the participant's point of view in terms of their experiences to enable the researcher to construct an understanding. During the data collection, analysis, and writing process there were interactions between the researcher and participants to be certain that the data is captured and documented accurately.

It is imperative data that collection remains objective and impartial. To avoid bias and to ensure personal ideas and influences do not affect the overall collection, peers and participants will review the analysis of the data and findings. The researcher maintained a journal or field notes with observations and transcribed notes from interviews. Transcripts were provided to participants for member checks to validate transcripts and find any discrepancies in data analysis to insure integrity in the research process.

*Data Collection Materials and Instruments*

The data collection instruments included direct observation, interviews, LMS survey, and artifact collection. These are described below in the order they were conducted.

Interview Format: Research questions guide the interview format in the case study. The interview process will allow for an organic nature as the answers may lead to further questions and clarification to expand on the topic. The interview should follow a common interview protocol that includes a format that is semi-structured to open ended. The protocol should also provide a respectful, interesting, and engaging experience for the participants (Appendix C).

Instruction Technology (Empower Learning Management System) Survey Instrument: This was completed by participants to elicit or capture the participants' beliefs, attitudes, and strategies for using the LMS and potential areas for professional development. It was also a tool to validate other sources of data collected and provide a cross section to triangulate data sources (Appendix D).

Direct Observation: The direct observation format was used formally and informally in a case study method so that the data was natural from the setting. Participants were observed using the LMS technology with students and during planning and development phases (Appendix E).

Artifact Collection: The artifact collection in the research includes items produced within the LMS, student activities and formative and summative assessments, teacher created documents, meeting minutes, and school based change action plans. The artifact collection and the interview responses allowed the researcher to elicit understanding of the artifact in relation the question to ensure alignment of what was captured from the data.

**Analysis of Data**

Data analysis within the qualitative multi-case study will look to examine the themes and patterns that emerge from the data collection in two phases. The first phase happened during the data collection process as the initial data collection verified and supported the subsequent data collection and finalization of the findings. The second phase occurred once all the data was collected, coded, and organized into themes and subthemes.

It was important to the researcher to avoid predetermined themes or categories but rather see them emerge as data is collected. To capture the data and interpret it in a meaningful analysis a comprehensive series of steps were followed:

(1) Organize the data and review it thoroughly to establish a sense of the whole picture

(2) Review thoughts, impressions, coded items and record them in a journal or table

(3) Identify and record impressions

(4) Study impressions, interviews for valid interpretations

(5) Reread data and code places where researcher interpretations can be validated or challenged

(6) Write a draft summary

(7) Review interpretations with participants

(8) Write a revised summary and cite excerpts from the data that support interpretations (Creswell, 2009, Merriam 2012)

The data collection and analysis remained flexible, as the participants guided the process based on their responses. The themes and subthemes were subjected to revision as more data was collected and analyzed.

## Participant Rights

The participation in the study was voluntary and participants could opt out of the study at any time. The participants received an invitation letter (Appendix A) and a signed consent form that included privacy protections (Appendix B). The data collected was organized and utilized without any participant identified through the use of coding to avoid individual markers. All transcripts, narratives, and findings were shared with participants and the completed study was provided to the participants.

## Limitations, Biases, and Ethical Considerations

The limitations of the study include a small sample size that is no more than 20 participants in small, rural elementary settings. This may limit the studies finding for a larger scope or system. The second limitation is the amount of classroom observations for each participant. The timeframe of the study may limit the findings especially if the learning management technology is new in the year of the study. To mitigate the limitations, the interviews and survey data helped to maximize perceptions and insights of teacher use of the learning management system. The researcher was a member of the implementation team for a learning management system of one site and must be cautious of biases and influences on the study. To minimize bias and ensure accurate data and findings, the researcher implemented frequent peer review and participant review throughout the study. It is important to understand the role of duality that comes with being an insider researcher by valuing the roles, managing both effectively to reduce conflicting situations, and reflecting on the impact of the dual roles on the study (Coughlan & Brannick, 2014).

## Conclusion

The case study's purpose, research questions, and conceptual framework depicts what I seek to make meaning of and ultimately offer both academic and practical knowledge, I feel the methodology is compatible with the both the literature and practices of a case study as the optimal method. Overall, the final study should serve as a contributor to future studies in an effort to better inform a design thinking process to support the implementation of personalized/customized learning.

# CHAPTER 4

# DATA ANALYSIS

*You almost have to be in the mess but also finding time within the mess because that is when you are creative. That's when kids are working. That's what feeds me, fills my well. Finding what these kids are interested in and accommodating them, then find the time to support them in it, and put it in Empower. (Participant Comment-Interview)*

The purpose of this qualitative case study is to explore teachers' perceptions, attitudes, and behaviors related to the use of learning management transformative technology that is the foundation of a blended learning environment to establish personalized/customized learning structures in rural, public, upper elementary classrooms.

This chapter will present the organization and analysis of the data from a qualitative case study. Data analysis is the process of making meaning of the data collected. It is a complex process to collect qualitative data. This process involves understanding how to make sense of text and images to answer the research questions and to tell a story (Creswell, 2015). It involves moving from the concrete data to the more abstract concepts, using a variety of reasoning strategies, then taking the participants descriptions and interpreting or making meaning of them (Merriam, 2009). There are varying recommendations from scholars as to what is the best process of collecting and analyzing data in a qualitative study.

The results discussed in this chapter come from the transcripts of both one-to-one and group interviews with 15 participants over an 8-week period. Each interview lasted 60-80 minutes. All the participants shared their personal experiences. Overall 7 categories emerged and within those categories 13 concepts/themes emerged from the quotes pulled from the interview transcripts summary statements to support the themes/concepts are included.

## Organization of Data Analysis

This study primarily focused on Merriam's recommended techniques, as it is the best fit for the research questions and data in this qualitative case study. The data analysis began while completing the interviews. After the first set of interviews was transcribed the researcher began to color code the transcripts into themes that were emerging from the descriptions given by participants. Once the coding began a table was developed in Microsoft Word to organize the themes, categorize themes, align quotes, and summarize concepts (Merriam, 2009). The goal of this process is to not simply report out on concepts or themes related to research questions, but to also attempt to tell an accurate story of the experiences of teachers using the learning management system Empower to support personalized/customized learning and to make recommendations from those stories in chapter 5 conclusions. The data analysis will be presented for clarity purposes in categories based on the research questions established in Chapter 1.

## Review of Participant Characteristics

The participants are upper elementary teachers in grades third to sixth and positional leaders interested and invested in the use of devices and learning management system technology at their prospective sites. The familiarity with technology is generally the same for all of the participants and they are using the same learning management system called Empower. However, each participant has unique stories of their knowledge base and skill set with the Empower LMS as they have gone through the implementation process.

*Table 2.* Sample Breakdown

| Site | Participants | Sample Size |
|---|---|---|
| Rural NH School with student enrollment of 125 K-5. | 3, 4, 5, and 6th Grade Teachers (One per grade) and one building Principal | 5 participants |
| Rural ME School with student enrollment of 165 K-12 | 3,4,5, and 6th Grade teachers and one building Principal | 5 participants |
| Rural ME Charter School system with student enrollment of 135 K-8 | 3,4,5, and 6th Grade teachers and one building Principal | 5 participants |
| | Total Sample Size | 15 |

## Research Questions

How does the transformative technology Empower Learning Management system impact the ability of teachers to implement structures to support personalized/customized learning?

How do teacher attitudes, perceptions, and behaviors impact the implementation of the technology for customized learning?

Sub questions:

(a) What do teachers describe as the essential aspects of a Learning Management System technology?
(b) How do the essential aspects of the Learning Management System support personalized/customized learning?
(c) What are the teacher's perceptions of the aspects of Empower Learning Management System technology that are difficult and not being used to support them in personalized/customized learning? Are there tools that could be more utilized?
(d) What are the teachers' perceptions of the essential practices in teaching and learning that impact the positive use of the technology in transforming to personalized/customized learning?
(e) What do the teachers identify as important professional learning supports and/or activities to integrate this technology into their practice?

## Analysis of Data

The categories and themes are displayed in order of importance based on the participant's responses. These categories and connected themes have varying degrees of connectedness and influence on the overall summary statements derived from the coding and thematic analysis.

### Category 1 Pre Work

#### *Theme 1 Beliefs, Vision and/or Philosophy of Customized/Personalized Teaching and Learning*

The first theme that emerged from the data analysis was the impact of the beliefs about teaching and learning, how those beliefs drive the vision of customized/personalized learning, and the use of the LMS Empower.

One leader explained:

"At its most basic level kids learn at different rates of time and in different ways and that is the foundation of customized learning."

A teacher participant expressed:

"The teachers need to believe in the vision of customized/personalized learning or the technology will not make sense to them."

A teacher participant said about customized/personalized learning vision; "That would be my hope and dream is to get kids to tell you, this is how I learn, because I have a feeling it is a lot different than what we are doing." While all the participants expressed this in different ways it became clear that this pre-work of making the vision visible is a key factor in getting staff on board and willing to put in the time to learn and use the Empower LMS.

*Table 3.* Theme 1 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Beliefs and Vision of Personalized/Customized Teaching and Learning | • Understanding the vision and premise of personalized learning is critical to understanding the need for a learning management system.<br>• Understanding that the current delivery structures make it impossible for kids to access learning 24/7<br>• Leadership has to be invested and make the vision visible to all stakeholders |

### *Theme 2 Components of Customized/Personalized Learning*

The participants communicated overall that in order for the use of Empower to be successfully implemented as a tool to support customized/personalized learning, stakeholders needed to make meaning of the components of customized/personalized learning, and know how to put them together to bring the theoretical idea to a practical level using the tool.

Participants all agreed that the habits of mind and habits of work were the key starting places in the process and would be integral to ensuring students had the skills needed to take ownership of their learning. As one teacher said, "They are taking ownership of their learning and I think that is the most important part of personalized learning." Another teacher pointed out that it is so important that they understand growth mindset and habits of mind and work. This was something she spent a lot of time on so that when students go to work in a playlist they won't automatically look for the teacher but will have the independent skills and strategies to keep going and troubleshoot.

The next component of personalized learning that every teacher mentioned on some level was the ability to group and regroup. One teacher said, "I can group and regroup them depending on if someone needs more time, someone is moving faster, somebody new comes to us, and it just keeps the fluidity of learning going." This is a powerful finding because teachers

are normally stuck in a schedule that keeps such differentiation from happening. When technology can remove that barrier to free up students and teachers to restructure learning without wait time the accessibility to learning is far greater. Teachers can adjust to a learner's needs and on the fly and time is not a barrier.

Leaders and teachers both agreed that an important component to customized/personalized learning is the ability to communicate efficiently and effectively where learners are at in any given time. A leader said, "Empower, like any other software communication tool is as good as the user time and user knowledge." This is an important statement as no matter the capacity of software to bring customized/personalized learning to a practical place, the teacher will determine how effective Empower is to the learners and parents they are communicating with. The transparency of this is important and all the teachers especially mentioned the ability to see all the learning progressions in the target browser and having those connected to the reporting out structure was a powerful tool in the system that brings synergy to the components of personalized/customized learning. The reason is that teachers can assign learning goals or pathways to individual students that will report out at any time. One teacher stated, "I can assign the learning pathways to a group or learner so that I could see and they could see the progressions of learning."

All teachers and leaders made statements to confirm that the growth mindset of the users of Empower is critical to the success of the tool and customized/personalized learning.

*Table 4.* Theme 2 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Components of Customized/Personalized Learning | • Finding out the student interests and giving students choice and voice in their learning.<br>• Habits of mind and work are important for students to be skilled at in order for them to navigate in Empower successfully and take ownership of their learning.<br>• Students need to learn the skills needed for independence.<br>• A target browser that aligns learning progressions and reporting out is critical to the empower technology<br>• The system supports grouping and regrouping of students flexibly and in live time; teachers have autonomy in grouping students and this is not tied to the grading structure.<br>• Removing structures that interrupt learning is critical to the teachers<br>• Student and teacher empowerment around time and learning is critical to ensuring learning drives time, not time drive learning<br>• Creating a growth mindset culture is another critical component |

## Category 2 Teacher Support to Learn LMS Technology

### *Theme 3 Learning Best Practices and Challenges for Teachers Using Empower*

Teachers at all levels have different personalities, learning needs, knowledge base and skill sets with technology, and time structures they are working within. All the teachers and leaders made it very clear that the diverse needs of teachers need to be honored and personalized professional development plans should be created so how teachers learn best is taken into account. Teachers and leaders both said they wanted a blended approach to the training and professional learning time.

Elementary school teachers expressed frustration with how professional development was delivered for them. A third grade teacher stated, "Many of the examples for us are high school

teachers, when I look at that it is overwhelming." This was a powerful piece of knowledge as it is true when putting in place technology like Empower, the fast runners within the system tend to be content specific upper level teachers and this model is not how an elementary teacher operates. This would be important to take into consideration when preparing professional learning for teachers.

Another key point that teachers and leaders pointed out is the motivation to learn Empower is not there until leadership sets timelines and expectations for the teachers. A leader said, "It was not powerful until teachers had to use it. Right. I have seen this with other educational software, Powerschool for example. Where there are still some teachers that don't use it to full capacity and others who do."

Another key point teachers and leaders made is how difficult the software is to learn, but once you do, it is a lot easier. A teacher stated, "It is overwhelming all you have to do and you really have to jump all in." Another teacher said, "The software when you first look at it is a blank screen and you realize you have to build it." An elementary leader said, "Teachers need PD in manageable pieces so they don't give up. If I have someone throw a lot at me with a computer program and I go around and around. I just hate it."

Both teachers and leaders said that the teacher-to-teacher coaching model works the best for them so they can get what they need in small chunks. They also said that some minimal training from Empower was necessary but most felt that those trainers go too fast for them so they need more coaching at their specific levels to make sense of the system. They also said that having the digital tutorials was helpful when they were working independently.

*Table 5*. Theme 3 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Learning Best Practices and Challenges for Teachers Using Empower | • Peer coaching is critical to understanding how the system supports teaching and learning and what teachers can do with the technology<br>• Digestible chunked PD especially for elementary teachers<br>• Personalized options such as on-line, webinars, and face to face interactions<br>• Elementary teachers would rather have a personal coach. They struggle with on-line learning<br>• Elementary teachers want models for how they teach because the MS/HS models are not the way they operate<br>• Technology trainings from empower are too fast and hard to take what is learned and apply it without a coach<br>• Understanding the structure of the target browser and collecting a body of evidence is critical and causing issues for users in learning the system. PD on this will be a large component for users. |

### *Theme 4 Planning Strategies*

All the teacher participants said that the planning strategies needed for blended learning and the use of Empower was a very important part of the overall professional learning time for teachers. They expressed that they can't plan the way they always have and have success in the system. Especially the third through fifth grade teachers who teach all subjects and tend to have a lot of teacher guide resources that dictate the lessons and units. One third grade teacher said, "I need to see how to plan for multiple content areas at the elementary level. I don't just teach one subject and this is frustrating and overwhelming."

The planning time once teachers understand how to plan differently is critical. Teachers stated, "You kind of plan out you're whole unit of study from beginning to end. I still do that on paper and then you know what your tiles need to be." "You need time to think through how to marry things together."

A participant who had worked at different schools using the Empower system for customized/personalized learning stated, "Somehow if in Empower they could see the pathway so that I don't have to create the playlist. In RSU# you could assign the pathway to group so you could say everyone has been marked off here, this group needs this, this group needs that, so it was much easier." This makes a lot of sense as the instructional planning in a customized/personalized learning environment requires teachers to really use data to support their instructional decisions. This participant brought to light the data driven planning that can be supported through the use of the Empower data organization capabilities.

The need to design think and engineer learning experiences both in the digital and physical world, was a theme throughout all the teacher and leader interviews. They clearly felt this was important to the success of customized/personalized learning with the use of Empower.

*Table 6.* Theme 4 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Planning Strategies | • Having a template for instructional design would be helpful in planning out the learning paths before entering things in empower and building the learning pathways<br>• Having learning pathways preloaded would be helpful |

### *Theme 5 Challenges and Roadblocks with Learning LMS*

The participants expressed clearly that the challenges and roadblocks with learning Empower did not completely stem from the system itself but rather leadership decisions that impacted the motivation to learn it. Teachers did express the complexity of the system as also being a roadblock, though.

A teacher stated, “Not knowing if the program is going to stay is a problem. There are a lot of teachers that believe this too shall pass, not me, but others. I have not put a lot into it because I am unsure and don’t want to lose all my work if it goes.” This caution came out in some way with all the teachers. They feel that many don’t want to waste their time and energy if it is going to go away like other instructional technology systems they have learned and put a lot of work into in the past.

Another big concern for the teachers is the systems cloud based structure and the ability to keep their work even if the system goes away. A teacher said, “With other technologies you can take it with you. I put all this in Empower and now I can’t get it back. Let’s say I go to another district and now all my work and resources are sitting in a cloud somewhere away from me and my stuff.” Most of the teacher participants felt there should be a way to download all playlists and resources so they don’t lose their intellectual property and hard work. They felt that if this could be done more teachers would work in the system.

Finally, all participants felt that the overall complexity of the system was a hindrance to the overall motivation to learn Empower, especially when they could lose everything they do. It takes a lot of time to understand all the components and build everything out. This is especially true for elementary school teachers. These teachers have a lot of resources and programs that they are using and when they look at what they have to do in Empower they are very overwhelmed. This is not a canned teachers guide that they can just open and use. They have to build it out. This according to the teacher participants is probably the biggest problem elementary school teachers have with it.

*Table 7.* Theme 5 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Challenges and Roadblocks with Learning LMS | • A lack of understanding of the vision of personalized learning and how to plan differently is creating a lack of motivation to learn empower<br>• Not knowing if the system is going to stay or go is causing a lack of motivation to learn empower<br>• Being overwhelmed with a lot of new concepts and learning a new technology<br>• The time it takes to understand all the components of the system and building out everything is a huge barrier or challenge; it seems many teachers are giving up because it feels so overwhelming; especially the elementary<br>• Teachers are not able to download and keep their work they build in empower. This makes them less motivated to put their work there because of that. |

## Category 3 Communication

### *Theme 6 Effective Communication for Understanding LMS*

A successful set of strategies for communicating the need for a system like Empower for customized/personalized learning resonated with all the teachers and leaders in the interviews. Each participant had expressed successful and not so successful strategies for communication. Teachers said repeatedly that having a clear communication plan starting at the district level was very important to them as they felt that much of the communication was left to them.

All participants felt that the community engagement had to be strong and leveraging students to communicate to their parents and community was the most effective thing they had done. A teacher said, "It's important to understand the culture of the school and community. That's why we are successful down here because we have spent a lot of time communicating with our parents and when we implement new things we know how to get them on board."

*Table 8.* Theme 6 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Effective Communication for Understanding LMS | • Having a district communication plan is important for the community to understand the work<br>• Communicating using the most effective strategies for the community culture is important<br>• Using communication strategies that engage the parents in the learning process is effective<br>• Using students to teacher their parents through student led structures is an effective communication tool |

### Theme 7 *Ineffective Communication Causing Issues with Buy-in of LMS*

The ineffective communication that has caused issues in all the sites in this study stemmed from lack of communication because stakeholders don't know what they don't know and the emotion around changing to a new existence and using a tool like Empower can be daunting for parents, students, and school staff. A teacher stated, "We needed a district communication plan around the role out of Empower. That is what we are hearing from parents. They like what we are doing but what happens next year when they go to the next grade. What is the plan? There is no district message." The biggest push back teachers are getting is from parents who just don't understand the purpose of the system and the changes occurring. Not enough has been done to help them.

*Table 9.* Theme 7 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Ineffective Communication Causing Issues with Buy-in of LMS | • Not enough of the right kind of communication to the stakeholders<br>• Not having a district leader out communicating the vision and what is next |

### Category 4 Time

#### *Theme 8 Reorganizing Time for Professional Learning; Time to Plan and Create*

Most of the teachers and leaders when discussing the system Empower and customized/personalized learning stated that though they believed in the theoretical vision behind all this work making it practical was another matter. The Empower system does what it advertises it will do and therefore does provide some practical solutions. They have a great passion and energy for the work, but time was not on their side and something has to be done about that. Though Empower did support some of the time issues all the teachers expressed how labor intensive the work is and that there is no real flexibility in how time is organized for them to do the work, which means they have to use a lot of their own personal time. They also expressed that this could be a real roadblock for an entire system as the early adopters are vested but those holding back are waiting to be given the time if they are going to be expected to change and build out learning pathways in Empower. As one teacher stated, "Find the time. We need the time. Gather your thoughts, get in there and do it when you are in a good frame of mind. Starting in the summer was good except you are not with the kids, and your seeing, not doing, you are not in the messy. You almost have to be in the mess but also finding the time within the mess."

It is clear from the teachers and leaders that leaders have to take the initiative in restructuring time in school, outside of school, virtually, and during the summer to meet the needs of time for all the teachers. The leveraging of time is a big factor in the teachers' minds to the successful use of Empower for customized/personalized learning.

*Table 10.* Theme 8 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Reorganizing Time for Professional Learning; Time to Plan and Create | • Leaders have to structure time in school, outside of school, virtually, and during summer to meet the needs of time for all the teachers<br>• Leveraging time is a big factor in the teachers success<br>• It is necessary to have accountability on where students and teachers are but it needs to be flexible and not tied to a grade book |

## Category 5 Technology Tools

### *Theme 9 Intuitive and Easy To Use LMS Tools*

In terms of the nuts and bolts of the Empower system participants were asked what they found intuitive and easy to use in the LMS tools. Participants all felt that the target browser, which houses the learning progressions by measured topic in every content area and how that is structured was very user friendly. They felt that making groups and putting grades in was very clear and simple. The ability to track learner progress is wonderful and empowering as one leader put it. A teacher stated, "I don't find it difficult now, if you had asked me 6 months ago I would have said almost everything is. It is a bit overwhelming. You have to take on the whole thing at once. It is like taming a puppy."

From the participant point of view the easiest part of the system is the tracking student learning features.

*Table 11.* Theme 9 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Intuitive and Easy to Use LMS Tools | • The target browser is easy to navigate<br>• Filling in the grading spreadsheet is easy and very similar to a traditional gradebook to a degree<br>• It is easy to use for tracking learner progress |

### *Theme 10* **Non-*Intuitive and Difficult to Use LMS Tools***

The non-intuitive and difficult to use tools in Empower seem to stem from the features that provide teachers the ability to create learning experiences in the form of playlists (similar to units of study) and all the activities, assessments, and resources that can be strung together to provide students with 24/7 access to learning and establishing a body of evidence to determine a proficiency score. A leader said, "The technology is a good vehicle to manage but if they don't have all those pieces that technology just isn't, it is just a grade book at that point or a data warehouse. So because you really have to have the philosophy in order to really leverage it." All the participants said that the playlists are more complex and they require a lot of backwards planning. So, when the tools don't function right it is very frustrating.

The tools that seem to have the most issues according to the teachers, which in turn makes their work flow harder, is the feedback tools (the locker, the social networking components, and the way evidence is submitted) is taking way to many steps. One teacher mentioned in some ways these things would be easier by hand instead of in the technology because of the nature of how they work currently.

Another problem that most of the teachers mentioned is the constant changes both with the Empower upgrades and the curriculum inside the target browser. These changes seem to happen often and so once they learn something and feel comfortable, then an upgrade happens and it all looks different. This is particularly frustrating for elementary teachers and their age group of students.

Several leaders stated, there needs to be clarity on what the system's full capabilities are. If you don't know what all the features are, then you don't know what to turn on or off. One leader suggested a checklist of what all the features are within the system so they could make better decisions for their site. Also, leaders felt that one of the biggest advantages to the system is the crowd sourcing capabilities and this has not happened across districts yet. The leaders feel that this is a barrier that is really preventing the leveraging of Empower and frustrates people. Elementary teachers expressed they wanted this to happen so that they would have resources to pull from for learning goals and not have to build everything themselves.

Overall teachers and leaders felt they are still vested in Empower as early adopters but if the system issues are not resolved in a timely manner, this will continue to impact teacher's motivation to stay with Empower.

*Table 12.* Theme 10 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Non-Intuitive and Difficult to Use LMS Tools | • Playlists are more complex they require a lot of backwards planning<br>• The body of evidence how that is tracked and how it is put into the system is cumbersome<br>• The feedback tools (the locker, the social networking components, and the way evidence is submitted) are requiring too many steps for teachers. It is not streamlined so they are having to take more time than they would if they just did it in the physical world.<br>• The system is so interconnected that teachers are finding it complex at first<br>• The teachers find that changes happen in the target browser to often and they can't keep up<br>• The teacher and leaders struggle with the continuous updates to the empower platform that change the way they have to navigate the system. So once they get used to one way then all of a sudden it is different.<br>• There is a lack of clarity in what the system has for full capabilities and what to customize for an individual site.<br>• Sharing resources has been difficult and non-existent.<br>• Grading in the system if very different and not intuitive to users.<br>• There needs to be notifications in the scoring tool to support teachers so the body of evidence is up to date |

### *Theme 11 Technology not Working*

The access to working technology both with Empower as well as the structural and device components was a significant factor for teachers on the user end. One leader said, "It would be nice if they would just roll out the Cadillac instead of the Ford you have to keep adding to. I wish there was more crowd sourcing. In a small district we need that. The sharing out."

Teachers shared having issues with internet not working, computers not charged, old devices, login in issues, not having 1:1 computing, and getting the SIS and LMS to talk seamlessly were all making it difficult to work in Empower successfully. These would be issues that local technology staff would need to solve but important if Empower is to be used successfully in the cloud so addressing those items are critical to accessing it.

Teachers also stated that Empower itself was frustrating as the glitches in the system or bugs that have to be worked out are not done in a timely manner and then teachers give up and find something else. These glitches include sites not opening up, when new versions are updated they lose work they did, quiz features that don't work, and feedback tools that are cumbersome to use. When they are in the trenches, live with kids, they need things fixed immediately, not days or weeks later. This has been a major issue for users.

*Table 13.* Theme 11 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Technology not Working | • Ensuring the devices are working properly and can handle the platform successfully is very important<br>• High speed internet access is critical<br>• Device management with younger students is critical<br>• The new versions of the system cause a lot of glitches and teachers are struggling with keeping up with the changes and losing work they did in the prior version<br>• Students need hard skills in technology to be independent and be able to troubleshoot<br>• If changes in the local systems are happening it effects the use of the platform |

When technology issues that a help-desk call could resolve came up during interviews, I acknowledged the issue but focused our primary discussion on the creative, more complex development issues in regards to the use of the technology to support personalized/customized learning. These results reflect the more interesting, longer-term issues of that approach. I didn't want the participants to feel uncomfortable or exposed for not knowing something that might be simple in nature or remedied with a meeting to troubleshoot with the IT or systems tech support departments.

## Category 6 Work Flow

### *Theme 12 Instructional Design*

Teachers overall expressed that the way you go into Empower to look at the learning goals and proficiency scales then spend the time to create and group students around them is powerful but takes lots of time. It isn't a canned program so having support with an instructional design procedure would help them figure out how to plan digital and face to face instruction more efficiently and effectively. This strong knowledge base and skill set in instructional design is important to the overall success of using Empower to support customized/personalized learning.

When listening to teachers and leaders it is clear that the ability to create a sustainable work flow that will in time provide teachers with a way to reduce the complexity of their craft through better planning structures is necessary.

*Table 14.* Theme 12 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Instructional Design | • Teachers need to have an instructional design procedure to help them figure out what should happen in their physical world and digital world<br>• A strong knowledge base and skill set in instructional design for blended learning is important |

## Category 7 Leadership

### *Theme 13 Vision and Leadership*

Throughout the interviews participants discussed the leadership needed for the vision of customized/personalized learning to become reality with the use of transformative technologies. All the participants on some level expressed the need for strong, consistent, and present leadership that followed the effective second order change processes that result in a sustainable and successful transformation. The participants who felt that leadership did not support them were in a place of great frustration and exhaustion from the implementation and were on the verge of giving up. One teacher participant said, "There is no support from administration to focus on habits of work and habits of mind. Nothing I say convinces them that if we get that more in place the content will come quicker. I am not getting anywhere with that so I have given up."

It was very clear from all the participants that leadership was a driving force in the success or failure of the transformation to a personalized/customized learning culture through the use of learning management technology.

*Table 15.* Theme 13 Summary of Ideas

| Theme | Summary of Ideas |
|---|---|
| Leadership | • Leadership needs to be invested and strong supporters of the practitioners<br>• Leadership needs to be consistent and understand the work<br>• Leadership needs to articulate the work, what is happening, and why<br>• Leadership needs to support the PD and time<br>• Leadership needs to understand second order change |

## Summary

This chapter has described the data and analyzed the findings of upper elementary teachers and leaders use of the Empower LMS to support customized/personalized learning. The themes that emerged from the data analysis process show the concepts that need to be addressed when using a system like Empower in the K-12 setting. The next and final chapter presents interpretations, conclusions, implications, and recommendations for future users of the Empower system for customized/personalized learning.

# CHAPTER 5

# INTERPRETATIONS, CONCLUSIONS, AND RECOMMENDATIONS

This study examined the experiences of upper elementary teachers and leaders implementing the learning management system Empower to support personalized/customized learning. The qualitative study explored and sought to understand teacher's perceptions, attitudes, and behaviors associated with establishing the environment for personalized/customized learning.

This chapter will present interpretations and offer conclusions based on the qualitative data analysis of the findings. It will discuss the implications of the theory and practice, how it contributes to the literature, and the limitations of the study. This chapter will finally give recommendations for others in the field implementing LMS technology to support personalized/customized learning as well as, future research.

## Review of Study

As schools begin to transform to a personalized/customized delivery system it is clear that transformative learning management technology is an unavoidable need. Practitioners recognize that in order to meet the needs of all learners they have to adopt structures and technologies that go beyond the capabilities of standardized structures and delivery systems that hold fixed only what can be measured, while leaving behind the very things that are critical to learners and their future success. The blended learning approach that provides learners with 24/7 access to learning and breaks down time barriers, personalized/customized tracking of learning, and the ability to create personalized/customized instruction and assessment opportunities deconstruct the standardization and weapons of mass instruction. With adopting

personalized/customized learning there is no doubt that it comes with many challenges both internally and externally in public school systems.

This study fills a gap in the literature pertaining to the need for the research in the context of the practitioner (teacher), that demonstrates the ways practitioners understand he vision, the need for such technologies, and how the teachers interact with the technology to support their beliefs about teaching and learning. Based on the data analysis the following findings and conclusions were identified by the researcher and will be discussed in the next sections.

**Interpretations**

Through the interview process of the participants, which provided rich detail of their experiences with the Empower LMS, the essence of how supportive the technology is to the practitioners in making personalized/customized learning practical emerged. The data analysis depicts categories and themes that resonated from the participants. To interpret the data the themes will be connected back to the research questions.

Question 1 How do teacher's attitudes, perceptions, and behaviors impact the implementation of the technology for personalized/customized learning?

Related Sub Question: What are the teachers' perceptions of the essential practices in teaching and learning that impact the positive use of the technology in transforming to personalized, customized learning?

Every participant interviewed responded similarly in expressing the critical importance of the pre work necessary to ensure that the vision of personalized/customized learning is understood by all stakeholders. This pre work included autopsying the beliefs about teaching and learning and understanding the components of personalized/customized learning.

It was very clear that everyone agreed the teachers that found the most success with the Empower LMS had made deep meaning of the beliefs and vision and therefore understood the need for the technology. Those that did not share those beliefs or did not understand the components of a new delivery system had a much harder time becoming motivated and therefore building a skill set and knowledge base to be successful with the Empower LMS. The deep and meaningful belief system about student learning is a determining factor in changing a teacher's behavior and therefore a successful experience with this transformative technology.

The teachers need to make meaning and see the practicality of how all the components of personalized/customized learning fit together and work in synergy. It is important that the first step and crucial component of developing and maintaining a viable learning progression structure K-12 for every content area has been done before the Empower LMS is put in place live with learners. The reason for this is that the entire system is dependent on making transparent what needs to be learned and this is then directly tied to the reporting structure. Empower calls this the target browser. Teachers build their instruction and assessment tasks from this target browser and when they assign learners to those learning progressions, the reports that are generated indicate where the student is on the learning goals on which they are working on. This component can make or break the successful use of Empower.

The balance in what learners need to learn to mastery in the areas of content, complex reasoning, and habits of mind and work is another critical part of the process. In a personalized/customized competency-based learning system each of those hold equal weight but can't all be measured and this creates conflict that has to be addressed.

This brings back the idea that the learning culture has to shift from content driven to complex reasoning and habits of mind and work driven. Teachers implementing the Empower

LMS stressed that habits of mind and work are critical to the success of students navigating within the system and taking ownership of their learning. Habits of mind and habits of work are beyond what can be measured but are life long learning skills. They need to hold greater weight than they currently do in our traditional delivery system. They should not be scored but part of the learning culture with descriptive feedback based on the dimensions of building a habit given to the learner.

Teachers will also have to move from low rigor retrieval and comprehension tasks to higher analysis and knowledge utilization complex reasoning tasks that ask students to apply content knowledge and habits of mind and work at a much deeper level. They will also have to gain skills in blended learning instructional design model, which is different from the way they currently teach as they have to provide instruction and assessment that can be accessed 24/7 beyond the brick and mortar, time based structures. This is an area that seems to come with resistance because teachers are not necessarily well trained in higher complex reasoning instructional and assessment strategies and therefore is a barrier to the implementation of Empower LMS. As Thomas Paine once said, "A long habit of not thinking something is wrong gives it the superficial appearance of being right" (Paine, 1776). This is the reason why teachers resist change. They think they are doing the right thing.

Another crucial component is communication with all stakeholders that is clear, effective, on going, and in lots of mediums to reach diverse audiences. All the participants expressed the need for effective communication, which should be led by the leadership. Teachers understood their role in communication, especially in leveraging the learners to communicate with their families, however leadership has to continue to promote the vision and make clear strategic direction and timelines for implementation. Along with this establishing a reflective practice and

shared decision-making model so that everyone feels they are part of the process. All the participants expressed the issues with communication that caused a lot more stress and workflow issues that may not have occurred if the communication had been better.

Overall it became clear there is power in beliefs and so it is essential that leadership put a great deal of time into this pre work to ensure the beliefs of the critical mass of practitioners are supportive of and understand personalized/customized learning and the components or the implementation of this type of transformative technology will surely fail.

Question 2: How does the transformative technology Empower Learning Management System impact the ability of teachers to implement structures to support personalized/customized learning?

Related Sub Questions: What do teachers describe as the essential aspects of a learning management system technology? How do the essential aspects of the LMS support personalized/customized learing? What are the teacher's perceptions of the aspects of the Empower LMS that are difficult and not being used to support them in personalized/customized learning? Are there tools that could be better utilized? What do the teachers identify as important professional learning supports and/or activities to integrate this technology into their practice?

The participants all resonated with the essential aspects of the Empower LMS as follows: The target browser they know is the glue that holds the system all together as the building blocks for playlists, as well as, the reporting structure to communicate the learning for each student. Because of the dynamic nature of how the system allows for grouping and regrouping and personalized/customized tracking the build out of the learning progressions is critical to the success of the overall system. There are several schools of thought on how to do this but it is

clear that no matter the method to get to the learning progressions the practitioners must understand the structure and how it is built in order to use it most effectively. This will inevitably be a determining factor to the Empower LMS implementation success. This is probably the most intuitive and easy part of the system according to the participants but if not built with research best practices of teaching and learning, which balance content, complex reasoning, and habits of mind and work, the technology will just be an industrial age delivery system like the current student information systems and then all you have is a new set of curtains on an old window. Therefore there would be no point for having it in the first place. So, leaders need to ensure that teachers are not being put through exercises in futility as they bring on board this type of system.

The most difficult components of the system stem from actual technological difficulties, instructional design strategies, as well as, philosophical conflicts, that arise primarily from how student learning is being tracked. The technological difficulties that hindered the teacher's ability to utilize the Empower system generally started with site based issues such as, Internet connection, actual hardware/devices, and system integration issues between Empower and other platforms such as the districts SIS and Google apps. These issues need to be taken care of by the technology departments on site and the technology departments need to work closely with Empower to troubleshoot so teachers are not waiting for access when they are trying to work with learners in the system.

Empower also has integration issues, updates that change the way teachers work in the system, and some of the tools are not user friendly and require more steps than teachers feel are necessary. Streamlining the workflow within the technology is important as the users will not continue with the system if their work is harder using it than not. One of the most common

comments made by participants was that updates and changes were not effectively communicated. These changes also created glitches that caused teachers to lose their work. This made it difficult for them and many teachers simply gave up using the tools to their fullest capabilities because it was just too much to keep up with.

The instructional design or backwards planning required to use the system is more complex than what most teachers have been trained to do. The participants interviewed found the system very overwhelming at first. They recognized that you have to jump all in with a good plan if you are going to use the system effectively. As one participant said; "It is a bit overwhelming because you can't just do a little bit." This was a problem for the users as they discovered if you want to go beyond just tracking learning goals and grouping and regrouping it goes from simple to very complex extremely fast. This fast transition was especially difficult for elementary teachers who are not used to tracking learning in a technology like upper level teachers and they struggle with seeing how this might benefit their younger learners.
A strong knowledge and skill base is essential in instructional design for a blended learning personalized model. When the teachers have drawn out how they want the learning landscape to look inside Empower the workflow does become less complex over time.

The collection of a body of evidence to show mastery of learning goals is another difficult transition in Empower. This stems from both philosophical and research based best practices and what the system does to remove toxic grading practices from the culture. Empower does not work on the 100 point A-F scale and the system does not average a body of evidence, Empower reports out only on the level of mastery of the learning goals on 4 point proficiency scale. This paradigm shift is particularly challenging as teachers, learners, and community whom are used to student information systems that teachers put student work with grades into

and an average is calculated. For elementary schools a descriptive or standards report is generally utilized and no data management is happening in a digital platform. Empower however allows for a body of evidence to be collected in one place and then teachers make a decision on a learning goal score that then populates in the calculated part of the system. This is a major shift in thinking for most stakeholders. A great deal of education and communication is necessary in order for the Empower system to be successful. Empower will be the scapegoat for grading philosophy issues if the practitioners are not all on the same page on collecting a body of evidence to mastery and are not clearly communicating that to learners and their families. This system in no way norm references it is completely proficiency based.

This leads to what the participants expressed as important professional learning and supports for their transition and implementation of the Empower LMS to support customized/personalized learning. The teachers and leaders feel strongly that peer coaching is a critical support structure that needs to be put in place and scheduled. Teachers need personalized supports not a one size fits all model. The professional development needs to be in digestible chunks especially for elementary teachers and they need models that match their level of learners. The teachers expressed how much they needed a different structure for planning time as the learning curve feel daunting and hard to reach. Teachers are being asked to engineer a completely re-imagined delivery system and they can't do this in the current time based structures in which they live. Having the ability to flexibly schedule their time, people, and resources is an imperative need that all the participants discussed in order to leverage what they need for support.

## Conclusions

Based on the findings in this research study, the following conclusions were drawn:

1. The pre work of making the vision of personalized/customized learning and its component visible to stakeholders is critical to the success of a technology to support it. It is an act of de-programming.
2. Ensuring a viable and valid structure of learning progressions for each content area, complex reasoning, and habits of mind and work is established is a foundational first step that cannot be skipped.
3. Providing practitioners with deeply meaningful learning experiences, personalized supports, and restructured planning time is crucial to sustainability and must be on-going.
4. It is essential that all practitioners have a solid understanding of instructional design in a blended learning model.
5. Time needs to be leveraged differently for practitioners and students. The time based fixed structures make it difficult to make the vision practical in all aspects.
6. The technology issues need to be rectified in a timely manner and better communication in this area is much needed. Teachers can't wait for days for the issues to be fixed. They are working live with students and need the technology to be up and running smoothly at all times so it is important to have highly effective IT support.
7. The teachers can decipher technology problems that can be solved through IT support vs. the creative development issues they encounter. The teachers need to have collaborative, instructional design sessions with the technology directors and software developers to ensure the creative design tools are productive and user friendly for creating personalized/customized pathways.

8. Highly effective communication to all stakeholders, especially the parent/guardian group, is a critical need for the successful and sustainable impact of Empower on personalized/customized learning.
9. The role of leadership is foundational and essential to the implementation of Empower. Leadership has to create the conditions for success of the practitioners and learners.

The interpretations of the data and the conclusions lead to the following implications for practice describe below.

**Implications for Practice**

Given the political, systemic, and technological implications of personalized/customized learning and the use of transformative learning management technologies it begs the question is there a vested interest in transforming to a re-imagined delivery system? The findings and interpretations point to a very viable and vested interest by practitioners to do so. Additionally, it appears that paradigms and perceptions of the practitioners and the behaviors they exhibit contribute to the scholarly and practical dialogue on the work in the context of personalized/customized learning as well as the implementation of transformative technology. This can also lead to support practitioners in going from the theoretical to the practical application within K-12 systems.

**Implication 1**

*Highly effective communication of the vision and components of personalized/customized learning, specifically starting with leadership at all levels.*

The study points out and supports the importance of communication at all levels of leadership. Successful communication by leadership makes the practical application of this work more viable and visible to stakeholders. The lack of communication by leaders leaves

stakeholders feeling out of the loop, confused, and lacking in strategic direction and clear actionable steps as they transform and make the vision a reality.

Leadership should organize visioning conversations with all stakeholder groups prior to implementation of personalized/customized learning and technology implementation. Along with this strategic alignment work systemically should take place so that all stakeholders know the plan of implementation.

The participants in the study felt strongly there should be a well-devised communication plan created by stakeholders and made a continuous part of the overall protocols and processes district wide.

**Implication 2**

*The practitioners need to have on-going personalized supports for implementation of personalized/customized learning and the use of transformative learning management technologies.*

According to participants without on-going support that provides them with flexible time, meaningful learning experiences, and instructional design planning time the practical application of learning management technology will not be successful. The participants expressed the lack of available and knowledgeable leadership, the feeling of being left alone to figure it out, and time limited the successful implementation of the Empower system. The key to supporting the practitioners is responsive practices and protocols for individual needs. Below are some specific ideas:

- *Teacher-to-Teacher Coaching*: Having colleagues provide coaching is overwhelmingly the most supported option according to participants. This is a non-threatening and personalized support that ensures teachers get the help they need in

digestible chunks and pace that makes sense for the practitioners. This also allows users to express their challenges and frustrations in a safe and supportive environment.

- *Flexible Time Management:* Practitioners need to have the ability to manage time flexibly and not in the current fixed time structures they are currently in. This way they can be empowered to put in place instructional planning time that allows for practitioners to gain both individualized and collaborative planning. It will also allow for a more learner centered decisions that make it possible for learning to drive the time not time drive the learning. This will require a time management technology that is not associated with the SIS or LMS systems as they currently are due to the fact that these systems are where learning is tracked and by design makes time fixed.
- *Available On-Line Learning Options*: Fully accessible anytime, anywhere on-line learning and tutorial options is also important as once a practitioner participates in a face to face learning experience whether is an organized training or coaching session the ability to go back an revisit this through on-line tools that can be accessed whenever the practitioner wants it is powerful. Also for some practitioners this may be all they need to get up and running as this learning model fits them fine.

Overall the participants all expressed that a blended, personalized model of professional learning and time management was essential for their successful engineering of delivery system redesign with the use of Empower.

**Implication 3**

*The design of curriculum in the learning progressions model that balances content, complex reasoning, and habits of mind and work is essential preliminary work prior to*

*integrating the Empower Learning Management system for personalized/customized learning.*

It is apparent from the participants that being directly involved in this work is important to make meaning of what the learners need for essential and viable learning outcomes, which are clear and hold still for them.

It is also important as this work is the glue for the entire system to function successfully so if this is not understood or done in an evolutionary way, then the rest of the work will be much more difficult. There are organizations that have already done this work and it can be uploaded in Empower but there is danger in just simply taking this work on without ensuring that all stakeholders understand the model and the reason for the design. When designing evolutionary curriculum that will stand the test of time in ever changing standards driven environments, it may be more viable to take the additional time to train practitioners in the new curriculum structure and have them build it facilitated by an expert in proficiency based design. This way they have a vested interest in its success as it is their work and they can solve the problems that might be in it easier because they have a better working knowledge base. The participants in this study shared the frustrations with not being a part of that process and how confusing and frustrating it is to live with someone else's work.

**Implication 4**

*Tracking student learning and communicating (reporting) the learning in live time is an essential part of the overall practicality of personalized/customized learning and transformative learning management technology has to be in place for this to be done effectively.*

The grading and reporting structures for personalized/customized learning is the most political and in some ways complex part of the process. The participants in the study felt that this was not implemented well at any of their sites in terms of communicating with parents.

They know that in order to personalize/customize learning, norm referenced, standardized grading housed in a student information system makes it impossible in any sustainable or evolutionary way. It really isn't fair to learners. However, shifting to a whole new way of tracking student learning through the use of Empower is a gigantic leap that many stakeholders simply are not prepared to embark on. What the participants realized, however is that if you take on the Empower system you have to be all in, there is no half way. That being said, it is important that the pre-work of communication, visioning, and curriculum work to prepare for this is done well to lessen the political blow to the entire system. Also, most participants felt that prototyping the work in small pockets throughout the district would be and was a viable way to start but there has to be clear and definitive timelines for when the rest of the system will be on board and live with learners as stakeholders are not vested in the work unless they know they have to get on board in a clear and concrete timeline.

**Implication 5**

*Leadership needs to create the conditions for the practitioners to embrace and make practical the use of transformative technology to support personalized/customized learning by building their skills and confidence. Then leaders need to let go of their need to control what teachers and students do with their time. When they do the teachers and students are empowered and the practitioners are able to design and think, create curriculum and solutions as they develop effective personalized/customized learning pathways.*

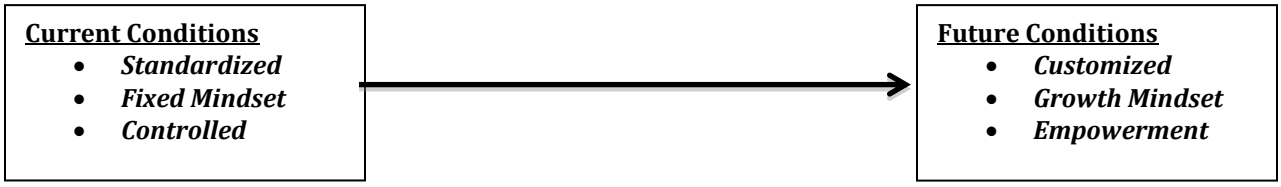



*Figure 2*. Conditions Graphic

The most important component of leadership is to provide an incubation period for teacher learning and reflection. This incubation period must be long enough and includes deep reflection on the components of personalized/customized learning, teaching and learning best practices, drive theory, and a building of skills in teaching complex reasoning and habits of mind and work. When this is done with adequate attention, students and teachers can be empowered to create and innovate. Once teachers and students have gotten to the place of growth mindset and empowerment, the customization of the teaching and learning environment will be successful and sustainable.

**Recommendations and Future Research**

The findings and conclusions offered in this study imply that additional research is needed in the other levels and stakeholder groups within the K-12 organization and the use of Empower LMS to support personalized/customized learning. This research study aids in filling that gap. As the cultures in schools shift to more personalized/customized structures and evolve and expand to the entire organization, there is a need for research that focuses on all levels and stakeholder groups within a community and organization. Specific recommendations for research are provided below.

**Recommendation 1**

*Determine the influence of parent/guardians in relationship to the political elements of transformative change specifically in the reporting or communication tools for learning outcomes.*

This aspect of the implementation process of learning management technology to support personalized/customized learning is the most political part of the process and in every site in this study participants said that this was a major roadblock to their success. Research is needed on

how to support the parent/guardian group of stakeholders on the best practices for shifting their paradigms and perceptions so the transition to a new delivery system is smoother for the entire organization. As teacher/practitioners parents need to be de-programmed out of the norm of industrial age delivery system and learning structures. This requires a psychological step before a full implementation can be successful. Research on how to proceed with a de-programming of parents/guardians so they will support and be a part of re-imagining a new delivery system is key to the political nature of this kind of massive change from standardization to personalized/customization.

**Recommendation 2**

*Examine with a closer lens the influence of leadership on the organizational shift to a new delivery system through the use of transformative learning management technology.*

Though this study did not focus on the leadership the participants felt his was a key area and would be worthwhile to pursue the leadership perspective. According to Kotter (2012), the use of effective leadership strategies, to successfully navigate transformative change, are critical to organizational success. In this study, participants expressed stronger leadership and effective communication at the leadership level as critical supports for them and the reason there were roadblocks or set backs at the community level. Although, a large body of literature support effective leadership in a change culture the need for specific leadership strategies for personalized/customized learning in public schools was identified as a need in the body of scholarly work. Participants felt that leadership impacted their success in a negative way because they were caught in the political nature of the change process and leaders fell back to the old model to appeal to the public. There is a need for research on how to support leaders in staying the course and getting through the politics of the change process more successfully to

support the practitioners.

**Recommendation 3**

*Quantitatively study the relationship between student achievement and personalized/customized learning in public institutions where all the components are in place.*

This qualitative study engaged participants in telling their personal stories of success and failure in their experiences so far in an effort to understand the practitioner perspective of the transformation and implementation of the Empower LMS to support personalized/customized learning. Although qualitative research allows for deeper understanding of experiences and insights, it does not provide the ability to see how the entire system is affected in terms of student success. The findings of this study could be enhanced if there was solid quantitative data from the student experience perspective and student achievement data.

**Recommendation 4**

*Both quantitatively and qualitatively study the different learning management technologies and the best fits for a new personalized/customized delivery system that will sustain the test of time and ever changing learning outcomes in the field.*

The field of education's only consistent variable is change. The field continuously brings on new insights from research, the continuous addition of transformative technologies that disrupt current practices, and the global economy that drives what students need for a knowledge base and skill sets to be competitive. That being said, it would add to the body of research and support this study if there was a clear and evolutionary model and technology structure that could stand the test of time and not require practitioners to make large leaps in changing their existence but rather live in one that can evolve seamlessly with change.

**Recommendation 5**

*Expanding the boundary and scope of the research to include a broader participant sample that focuses beyond upper elementary to take into account a deeper level of impact on the organizational level.*

This study was limited to third through sixth grade individuals in rural schools. Expanding the boundary of the participants both at early elementary and middle/high school, would add to the understanding of the overall phenomenon of personalized/customized learning at the organizational level. The perceptions, behaviors, and attitudes may prove to be different depending on the level within the organization teachers and leaders are stationed.

**Concluding Remarks**

The impact on personalized/customized learning with the use of transformative technologies is a powerful model that can ensure that all learners are thriving in public schools. The essence of this work however, comes from the people within the organizations and their ability to make the theoretical vision practical in the organization K-12. The insight gained from this study allows the K-12 practitioners to better understand the work, the importance of the people, and the organizational structures that need to be in place for the success of the overall transformative process. Though this study did not differ from the literature in the components needed for personalized/customized learning, the study did offer insights into how to make it practical with the use of transformative learning management technology, professional learning support, and highly effective communication loops that support the practitioners in the work.

As personalized/customized learning and transformative learning management technologies continue to evolve and make the norm a work flow that embraces growth mindset, taps into the interests and strengths of learners, meets learners at their personal needs level, and

embraces empowerment of learners and teachers to drive the system to a learner centered vision that will inevitably overcome the current rigor mortis our field still exists in. In doing so, it is necessary that all stakeholder groups and policy makers remove time-based structures and create the conditions for this theoretical idea to become practical. This will require a great deal of community relationship building, research based best practices in teaching and learning, shared visions and decision making models, and transformative technologies to organize the work flow and make it manageable and possible for the practitioners in the field.

# REFERENCES


Abramson, L. (2011). Schools blend computers with classroom learning. *All Things Considered*. Retrieved from National Public Radio at www.npr.org/2011/06/22/137318998/

Anderson, J. (2010). Customized executive learning: AA business model for the twenty-first century. *Journal of Management Development, 29*(6), 545-555. DOI:10.1108/02621711011046512.

Anderson, D., Benson, V., & Ooms, A. (2011). Educators' perceptions, attitudes and practices: blended learning in business and management education. *Research in Learning Technology, 19,(*2), 143-154.

Anderson, T. (2011). Theories for learning with emerging technologies. In G. Veletsianos (Ed.), *Emerging Technologies in Distance Education* (pp. 23-39). Edmonton: Athabasca University Press.

Allen, E., Picciano, A., & Seaman, J. (2010). Educational transformation though online learning: to be or not to be. *Journal of Asynchronous Learning Networks,14, ,* (4),17-35.

Allen, E., Seaman, J., & Garrett, R., (2007) *Blending in: The extent and promise of blended education in the United States.* Needham, MA: Sloan-C.

Allen, G. (2008). Practicing teachers and web 2.0 technologies: Possibilities for transformative learning. Retrieved from Proquest Dissertations and Theses 478-n/a http://search.proquest.com/docview/304627322accoutid=12756.(30627322)Baker, B. D., Orr, M. T., & Young, M. D. (2007). Academic drift, institutional production and professional distribution of graduate degrees in educational administration. *Educational Administration Quarterly*, *43*(3), 279-318.

Bacon, N., Becker, R.M., Mann, D. & Shakeshaft, C. ( 2011). Immersive, interactive, web-enabled computer simulation as a trigger for learning: the next generation of problem-based learning in educational leadership. *Journal of Research on Leadership Education, 6*(5), 273-287.

Berge, Z. & McElvaney, J. (2009). Weaving a personal web: using online technologies to create customized, connected, and dynamic learning environments. *Journal of Learning and Technology, 35*(2).

Black, P. & Wiliam, D., (1998). Inside the black box. *Phi Delta Kappan. 80*(2). *139-148*

Bligh, J., & Bleakley, A. (2006). Distributing menus to hungry learners: Can learning by simulation become simulation of learning? *Medical Teacher, 28*(7), 606-613.

Bloomberg, L & Volpe, M. (2012). *Completing your qualitative dissertation*. SAGE Publications

Bolman, L., & Deal, T. (2008). *Reframing organizations: Artistry, choice and leadership (4th Ed).* San Francisco: Jossey-Bass

Bozalek, V., Frantz, J., & Rowe, M. (2013). Using Google Drive to facilitate a blended approach to authentic learning. *British Educational Research Association*, 44(4), 594-606. DOI: 10.1111/b jet.12063.

Chen, H., Dennis, E., Meyer, Pavlik, J., P., Pryor, L., Rogers, E., & Sundar, S. (2002). Learning reconsidered: education in the digital age communications, convergence and the curriculum. *Journalism and Mass Communication Educator, 57*, 292-317. DOI: 10.1177/107769580205700405.

Cherry, L. D. (2010). Blended learning: An examination of online learning's impact on face-to-face instruction in high school classrooms. Retrieved from *ProQuest Dissertations and Theses*, 428-n/a. http://search.proquest.com/docview/230909406?accountid=12756.

(230909406).

Christensen, C, Horn, M, Johnson, C. (2008). *Disrupting class: How disruptive innovation will change the way the world learns.* New York, NY: McGraw Hill.

Collins, A. & Halverson, R. (2009). *Rethinking education in the age of technology: The digital revolution and schooling in America.* New York: NY.

Collins, J. (2005). *Good to great and the social sectors: Why business thinking is not the answer.* New York, NY: Harper Business

Colby, R & Bramante, F. (2012). *Off the clock: Moving education from time to competency*. Thousand Oaks, CA. Corwin.

Coughlan, D & Brannick, T. (2014). *Doing action research in your own organization (4th ed).* Thousand Oaks, CA: SAGE publications.

Creswell, J.W. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Boston, MA: Pearson.

Cuban, L. (2012). Standards vs. customization. *Educational Leadership, 69*(5), *10-15*. ASCD.

Culatta, R. (2012). Accelerating innovation in education technology. *Educause Review*. 25-34. Retrieved from http://er.educause.edu/articles/2012/11/from-innovation-clusters-to-datapalooza-accelerating-innovation-in-educational-technology.

Daniels, B. M. (2009). *Motivation, academic success, and learning environments: Comparing high school face-to-face and online courses.* Retrieved from ProQuest Dissertations and Theses, 134-n/a. http://search.proquest.com/docview/288084686?accountid=12756 (288084686).

Davis, S. (1996). *Future perfect*. Reading, MA. Addison-Wesley.

Davies, A. (2000). *Making classroom assessment work.* Bloomington, IN. Solution Tree.

De La Varre, C., Keane, J., & Irvind, M.J. (2010). Enhancing online distance education in small rural US schools: A hybrid, learner-centered model. *Journal of Asynchronous Learning Networks, 15*(4), 35-46.

Dewey, J. (1932). *How we learn.* Boston, MA: Houghton-Mifflin**.**

Dweck, C. (2006). Mindset: the new psychology of success. New York. NY. Random House Publishing.

Farrell. T, & McDonald, D., (2012). Out of the mouths of babes: Early college high school students transformational learning experiences. *Journal of Advanced Academics, 23*(3), 217-248.doi:10.1.1177/1932202x12451440.

Fleck, J. (2012). Blended learning and learning communities: opportunities and challenges. *Journal of Management Development, 31*(4), 398411.

Franke, N., Schreier, M., & Kaiser, U. (2010). The ‘‘I designed it myself’’ effect in mass customization. *Management Science, 56,* 125–140.

Freund, R. (2003). Mass customization, personalization and contextualized multiple competencies *Journal of advances in production engineering and management, 4,* 85-92. Retrieved from http://apem-journal.org/Archives/2009/APEM4-1special-085-092.pdf

Fullan, M. (2007). *Leading in a culture of change.* Hoboken, NJ: Jossey Bass

Fullan, M. & Hargreaves, A. (2012). *Building professional capital: Transforming teaching in every school.* New York, NY: Teacher College Press.

Gallos, J. V. (Ed.). (2006). *Organizational development: A Jossey-Bass reader.* San Francisco, CA: Jossey-Bass.

Garrison, D.R., & Vaughan, N.D. (2008). *Blended learning in higher education,* San Francisco: CA: Jossey-Bass Wiley Imprint.

Gregory, G. & Kaufeldt, M. (2015). *The Motivated Brain*. Alexandria, VA: ASCD

Goffee, R. and Jones, G. (2009). Clever: Leading your smartest, most creative people. *Harvard Business School Press*. Boston, MA.

Hall, O., & Ko, K. (2008). Customized content delivery for graduate management education: application to business statistics. *Journal of Statistics Education,16*(3), 1-16. www.amstat.org/publications/jse/v16n3/hall.html.

Herrington, J., Herrington, A., Mantei, J., Olney, I. & Ferry, B. (2009). New technologies, new pedagogies: Mobile learning in higher education. *Wollongong: University of Wollongong*. Retrieved June 15, 2012, from http://ro.uow.edu.au/newtech/

Hersey, P., Blanchard, K., & Johnson, D. (2012). *Management of organizational behavior.* Upper Saddle River, NJ: Pearson. (Overview of various change strategies; emphasis on usefulness of Situational Leadership style).

Hong, Y., Liao, H., Sturman, M., & Zhou, Y. (2014). Competing through customization: using human resource management to create strategic capabilities. *Organizational Psychology Review, 4*(2), 124147. DOI:10.1.1177/2041386613504608

Innosight. (2005). *Disruptive innovation primer.* Retrieved from Innosight website: http://www.innosight.com/documents/diprimer.pdf

Jarvenpaa, S. & Ives, J.B (1996). Introducing transformational information technologies: The case of the world wide web technology. *International Journal of Electronic Commerce, 1*(1), 95-126.

Kim, C. (2012). The role of affective and motivational factors in designing personalized learning environments. *Association of Educational Communications and Technology.* Athens, GA. 565-584.

Kinzer, C. (2010). Considering literacy and policy in the context of digital environments. *Language Arts, 88*(1), 51-61.

Kotter, J. (2012). *Leading change.* Boston: Harvard Business School Press.

Marzano, R. J. (2007). *The art and science of teaching: A comprehensive framework for effective instruction*. Alexandria, VA: ASCD.

McGarvey, B & Schwahn, C (2012). *Inevitable: Mass customized learning, learning in the age of empowerment.* Create Space.

Menapace, P., & Pisanu, Fr. (2014). Creativity & innovation: Four key issues from a literature review. *Creative Education, 5*(3), 145-154.

Merriam, S. (2009). *Qualitative research: A guide to design and implementation.* Hoboken, NJ: Jossey-Bass Publications.

McGee, P., & Reis, A. (2012). Blended course design: A synthesis of best practices. *Journal of Asynchronous Learning Networks, 16*(4), 7-22.

Natale, C. (2011). Teaching in the world of virtual K-12 learning: Challenges to ensure educator quality. *Educational Testing Service*. www.ets.org.

Paine, Thomas. (1999). *Common Sense.* Philadelphia: [printed] and sold by W. and T. Bradford [1776]; Bartleby.com. www.bartleby.com/133/. 05/01/16.

Papa, R. (2010). *Technology leadership for school improvement.* Thousand Oaks, CA: Sage Publications.

Papert, S. (1980). Teaching children thinking. *Contemporary issues in technology and teacher education, 5*(3-4), 353-365.

Pearcy, A. G. (2009). Finding the perfect blend: A comparative study of online, face-to-face, and blended instruction. Retrieved from *ProQuest Dissertations and Theses*,130-n/a. http://search.proquest.com/docview/304963133?accountid=12756. (304963133).

Pink, D. (2011). *Drive: The surprising truth about what motivates us*. NewYork, NY. Riverhead Books.

Reeves, D. (2011). *Elements of grading*. Bloomington, IN. Solution Tree.

Rice, K.L. (2006). A comprehensive look at distance education in the k-12. *Journal of Research on Technology in Education, 38*(4), 427-449.

Salvador, F., De Holan, P.M, & Piller, F. (2009). Cracking the code of mass customization. *MIT Sloan Management Review, 50*(3),71-78.

Schechter, C. (2011). Switching cognitive gears: Problem-based learning and success-based leaning as instructional frameworks in leadership education. *Journal of Educational Administration, 49*(2), 143-165.doi:10.1108/09578231111116707

Schwahn & Spady. (1998). *Total leaders: Applying the best future focused change strategies to education*. R & L Education.

Spady, W. (1998). *Paradigms lost: Reclaiming America's educational future*. R & L Education.

Stiggins, R. (2007) Assessment through the student's eyes. *Educational Leadership, 64*(8). 22-26.

Stone, A. (2008) Holistic model for blended learning: A new model of for k12 cyberschools. *International Journal of Information and Communication Technology Education, 4*(1), 56-71.

Sturgis, C. & Patrick, S. (2010). When success is the only option: Designing competency-based pathways for next generation learning. *International Associates for On-line Learning*.

Vienna, VA.

Thomas Paine. (n.d.). BrainyQuote.com. Retrieved May 3, 2016, from BrainyQuote.com http://www.brainyquote.com/quotes/quotes/t/thomaspain161749.html

United States Department of Education, *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.* Washington D.C.: Office of Planning, Evaluation, and Policy Development, 2010.

Unal, Z., & Unal, A. (2014). Investigating and comparing user experiences of course management systems: BlackBoard vs. moodle. *Journal of Interactive Learning Research, 25*(1), 101. Retrieved from http://search.proquest.com/docview/1504817187?accountid=12756

Veletsianos, G. (2011). Designing opportunities for transformation with emerging technologies. *Educational Technology, 51*(2), 41–46.

Wilson, B., Parrish, P. & Veletsianos, G. (2008). Raising the bar for instructional outcomes: towards trans-formative learning experiences. *Educational Technology, 48*(3), 39–44.

Wormeli, R. (2006). *Fair isn't always equal: Assessing and grading in a differentiated classroom.* Portland, ME: Stenhouse Publishers.

Yun-Jo, A. & Reigeluth, C. (2012). Creating technology-enhanced, learnercentered classrooms: K-12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education, 28*(2), 54-62.

## Appendix A

October 2015
Dear (Colleague Name),
As a researcher in a doctoral program through University of New England, I am writing to invite you to contribute to a research study on the use of transformative learning management technology to support personalize/customized learning structures in the elementary setting. You have valuable experience and knowledge in the area of implementing a learning management system and would contribute greatly to the body of information in this reform effort. The study intends to thoroughly examine the perceptions, attitudes, and behaviors (strategies) of elementary teachers implementing a learning management system to personalize/customize learning at the elementary level.

Research Question: *How does transformative technology impact the ability to implement structures to support personalized/customized learning?*

How do teacher attitudes, perceptions, and behaviors impact the implementation of the technology for customized learning?

Purpose of the Study: The purpose of this qualitative, case study, is to explore staff perceptions, attitudes, and behaviors related to the use of learning management transformative technology that is the foundation of a blended learning environment to establish personalized/customized learning structures in rural, elementary classrooms, in public schools.

Procedures: Your participation in this research is completely voluntary. The study will include interviews, meetings, observations, collecting of artifacts, and a survey. The study will run from November 2015 to March 2016.

Confidentiality: Your privacy will be fully protected during the study and after it is finished. The researcher will ensure your privacy is protected in all meetings, observations, and interviews in compliance with University of New England's Policies, Procedures, and Guidance on Research with Human Subjects

Questions: If you have any questions about this study and your participation, you may contact the researcher via e-mail at mistymcb@gmail.com or mmcbrierty@une.edu or by phone at 207-752-7072. You may also contact Dr. Michelle Collay, Director at mcollay@une.edu or by phone at 207-602-2010.

Thank you for your willingness to participate in this research study. Your insights will be invaluable to the body of research.
Sincerely,
Misty McBrierty, Principal Researcher
University of New England Doctoral Candidate

## Appendix B

Consent Form

Dear Participant,

The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that you are free to decide not to participate or to withdraw at any time without affecting your relationship with the researcher or your School District.

The purpose of the interviews, surveys, meetings, and observations is to understand your perspectives on the use of transformative learning management technology to support personalize/customized structures. Throughout the next year data will be collected through these means to document the processes of transformative change in personalized/customized learning.

Do not hesitate to ask any questions about the research process. Your personal information will not be associated with the findings from this process. Only the researcher will know your participant identity if you so choose.

There are no known issues, risks, or discomforts associated with this process. The expected benefits of your participation are the valuable information you share about your experiences through the transformative change process of transitioning to Personalized/Customized Learning K-12.

Please sign the consent form with full knowledge of the context and purpose of the interview. A copy of the consent form will be given to you to keep.

I, _____ am willing to
(Participant Name)
participate in the personalized learning study.

☐ Please check this box if you would like to be cited for your work as a participant in the study.

☐ Please check this box if you would like to be an anonymous participant in the study

Date: _____

Signature:
_____

**Misty McBrierty**
**EdD Candidate, University of New England**

## Appendix C

Interview Questions

* The goal is to gather the participant's stories on their experiences with the Empower learning management technology. These stories will also guide further follow up questions and data analysis.

Reference the Study Questions

*How does the transformative technology Empower Learning Management system impact the ability of teachers to implement structures to support personalized/customized learning?*

*How do teacher attitudes, perceptions, and behaviors impact the implementation of the technology for customized learning?*

- Sub questions:
  (a) What do teachers describe as the essential aspects of the Empower Learning Management System technology are teachers using and does it support them in personalized/customized learning?
  (b) What are the teacher's perceptions of the aspects of Empower Learning Management System technology that are difficult and not being used to support them in personalized/customized learning? Are there tools that could be more utilized?
  (c) What are the teachers' perceptions of the essential practices in teaching and learning that impact the positive use of the technology in transforming to personalized/customized learning?
  (d) What do the teachers identify as important professional learning supports and/or activities to integrate this technology into their practice?

Initial Interview Questions

1. Describe yourself, beliefs about teaching and learning, and how you view the use of technology in the classroom to support those beliefs.
2. Describe the learning management system Empower and how this supports personalized/customized learning in your practice?
3. Describe aspects of the Empower LMS that are difficult and you are not using? Are there tools that could be more utilized
4. Describe how the learning management technology was implemented in your setting.
5. Key Supports: Describe the essential supports you need or want to use learning management technology successfully in the classroom to support personalized/customized learning.
6. Key Limitations: Describe the implementation challenges? What didn't support your implementation? What would like to see changed or need to be more successful?
7. Is there anything you would like to share that was not addressed in the interview questions

Participants will be asked to bring artifacts to the interviews to show evidence and help to further understand their responses.

Essential questions for this would be embedded throughout the interview:

- How does this artifact support the experiences you describe?
- What reflective practice processes do you use individually and with teams to analyze impact, supports needed, and revisions to the technology to better support your vision for student learning?

* Follow up questions will be recorded based on participant responses and observations

## Appendix D

Survey
Survey Technology: Survey Monkey

- This survey is not meant to collect quantitative data but rather add to the qualitative interviews and observations at each site and to help with further qualitative questions that may help to engage participants in telling their stories

The survey design will be a short survey to gather data on the use of a learning management system, staff support needs, and teachers perspective on instruction and assessment pedagogy necessary for the use of this type of tool. The goal is to ensure the survey takes under 25 minutes.

Survey Questions:

**Participant Characteristics Data:**

1. What is your role?
(a) Teacher (3-6 grades) (b) Administrator

2. How long have you been in education?
(a) Less than 5 years (b) 5-10 years (c) 10-20 years (d) 20+ years

3. What is your highest level of education?
(a) Bachelors Degree (b) Master's Degree (c) Certificate of Advanced Study (d) Doctorate

4. How long have you been using a learning management system?
(a) Less than 1 year (b) 1-3 years (c) 3-5 years (d) 5 years +

5. My knowledge with learning management technology is:
Novice Intermediate Advanced

6. My experience with learning management technology is:
Novice Intermediate Advanced

7. My confidence with learning management technology is:
Very High High Medium Low Very Low

8. My overall expertise with learning management technology is:
Novice Intermediate Advanced

9. What learning management systems have you used in your classroom in the past? (Choose any that apply)
Moodle Google Classroom Canvas Blackboard Empower Buzz

10. What learning management system do you currently use?

**Participant Beliefs Questions:**

9. I believe learning management systems support personalized/customized learning
Strongly Agree Agree Disagree Strongly Disagree

10. I believe that technology supports teaching and learning
Strongly Agree Agree Disagree Strongly Disagree

11. I believe using a learning management system supports student motivation
Strongly Agree Agree Disagree Strongly Disagree

12. I believe a learning management does not satisfy or has limited application to support teaching and learning
Strongly Agree Agree Disagree Strongly Disagree

13. In my job, using a learning management system is important and relevant
Strongly Agree Agree Disagree Strongly Disagree

14. Describe or list positive aspects of the learning management technology you currently use to support personalized/customized learning.

15. Describe or list limitations or difficulties associated with using learning management technology to support customized personalized learning.

**Participant Attitudes/Perceptions Questions:**

16. The use of a learning management system helps me accomplish tasks more quickly
Strongly Agree Agree Disagree Strongly Disagree

17. Using the learning management system makes it easier to personalize/customize learning for my students
Strongly Agree Agree Disagree Strongly Disagree

18. Using the learning management system to integrate curriculum, instruction, and assessment is a good idea
Strongly Agree Agree Disagree Strongly Disagree

19. I have had a positive experience overall with the learning management system
Strongly Agree Agree Disagree Strongly Disagree

20. I have had a negative experience overall with the learning management system
Strongly Agree Agree Disagree Strongly Disagree

21. I feel the learning management system is easy for me to use or operate

Strongly Agree Agree Disagree Strongly Disagree

22. I feel the learning management system would be easier if I had more experience
Strongly Agree Agree Disagree Strongly Disagree

23. I feel the learning management system would be easier if I understood how to use it to support personalize/customized learning
Strongly Agree Agree Disagree Strongly Disagree

24. I feel that the learning management system has potential to support me but I need more experience and knowledge
Strongly Agree Agree Disagree Strongly Disagree

25. I feel that I have had and am getting the support I need to implement the learning management system
Strongly Agree Agree Disagree Strongly Disagree

26. I feel that using the learning management system is helping me to improve my overall performance in teaching and learning
Strongly Agree Agree Disagree Strongly Disagree

27. I feel confident in my understanding of the purpose of using a learning management system.
Strongly Agree Agree Disagree Strongly Disagree

28. Describe specific supports (professional development, tutorials, training, etc.) that have been used that worked

29. Describe specific things that made the use and implementation more difficult for you.

30. Identify specific professional development that would better support your knowledge, skill, and use of the learning management system.

31. Describe areas the learning management system could be improved to make the use of the system more accessible and useful to your job.

32. Record any further comments, thoughts or ideas that would help the researcher understand your beliefs, attitudes, and perceptions about the use of a learning management system.

## Appendix E

Observation Checklist

Participant Code: _____ Participant Grade Level: _____ Length of Class: _____

# of Students in the Class: _____

| Essential Question | What Observed? | Comments/Notes/Questions: |
|---|---|---|
| **What % of the class time were the students accessing the LMS?** | Less than 10%<br>Between 15-30%<br>More than 50% | |
| **What teaching and learning practices/strategies were being addressed during the use of the LMS?** | Collaboration/Social Interaction<br>Direct Instruction<br>Demonstration<br>Drill and Practice<br>Project based<br>Communication of learning | |
| **What tools or strategies were being used to personalize learning?** | Learning Pathways<br>Adaptive LMS technology<br>Progress monitoring tools<br>Content delivery tools/methods<br>Self Reflection strategies<br>Data | |
| **What types of teacher designed tasks were being done using the LMS?** | Acquire information<br>Processing information<br>Producing/presenting/communicating information | |
| **What web2.0 tools are integrated in the LMS and being used within the tasks created?** | Social Media Data Tools<br>Videos Communication Tools<br>Quiz creators Blogs<br>Presentation tools Research Tools<br>Word Processing | |
| **How is the system being used to keep track of progress?** | Student Data/graphs<br>Student dashboards<br>Student work submission<br>Student Learning pathways | |
| **What types of complex-reasoning skills are being addressed using the LMS technology?** | Knowledge Utilization<br>Analysis<br>Comprehension<br>Retrieval | |
| **What was the level of engagement by the students during the use of the LMS?** | High Engagement<br>All of the students<br>Most of the students<br>Some of the students<br>None of the students | |
| **Artifacts to Collect:** | | |