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A FORMATIVE PROCESS EVALUATION STUDY OF TEACHER USAGE
OF A LEARNING MANAGEMENT SYSTEM IN A K-12 PUBLIC SCHOOL

by

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A dissertation in practice submitted in partial fulfillment of the requirements
for the degree of Doctor of Education
in the College of Education and Human Performance
at the University of Central Florida
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Major Professor: Glenda A. Gunter

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ABSTRACT

The purpose of this study is to explore teacher perceptions, concerns, and integration of a Learning Management System (LMS) in a K-12 public school. With more educational institutions adopting LMSs, it is imperative to examine teachers' concerns regarding the tool as teachers have an important role in how effectively an innovation—such as an LMS—is implemented (Lochner, Conrad, & Graham, 2015). Ultimately, adoption of an innovation can be successful if teachers have an understanding of the components leading to the innovation's success, such as the innovation's value in enhancing both the curriculum and the students' learning experiences (Lochner et al., 2015). This study used the Concerns-Based Adoption Model (CBAM) as a main framework to not only measure implementation of the LMS, but to also increase the likelihood of the LMS effecting positive change in schools (George, Hall, & Stiegelbauer, 2006). The framework's Stages of Concern Questionnaire (SoCQ) was used with participants to determine teachers' concerns. The sample population for this study consisted of secondary teachers at a public high school in central Florida in 2017. Out of the 125 teachers employed at the school, a total of 36 ($n = 36$) participated in the online survey. Three of the teachers surveyed then participated in interviews to provide additional insight.

Data was analyzed and organized into five main topics: (a) Stages of Concern Profile; (b) teacher concerns; (c) benefits of the LMS; (d) barriers to the LMS; and (e) teacher needs. An analysis of the survey data revealed that the study's survey participants, on average, had the highest concerns at Stage 0 (Unconcerned), Stage 1 (Informational) and Stage 2 (Personal), thus indicating the group conformed to a non-user profile when it comes to LMS use. An analysis of the interview data revealed an overall positive disposition toward the LMS with the self-awareness that participants have more to learn about its capabilities. Results suggested that LMS

implementation should be refined in order to allow participants to advance to higher stages of concern (George et al., 2006). Further research should be conducted on other areas of LMS implementation, including the students' perceptions and concerns when it comes to using the LMS.

This dissertation is lovingly dedicated to my family—especially my parents, Victor and Patricia Franzese. My parents have been my biggest supporters when it comes to my education. My father is the one who always encouraged me to stay focused and to make school my job, thus teaching me the importance of investing in an education. My mother is the one who always believed in me and told me I could accomplish anything I wanted—even when I doubted myself. Both of my parents have always celebrated my accomplishments in school, and I could not have come this far without their love and support. I am forever grateful to them both, and I am so glad I listened to this advice from my father: *“If you say you can’t, you won’t. If you say you can, you will.”*

This dissertation is also dedicated to my husband, Steve Nuss, who has not only helped me handle all the stress throughout the program, but has also helped me achieve a healthy work/life balance. I am so lucky to have him on my team as we continue to build a beautiful life together.

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“He who dares to teach must never cease to learn.” – John Cotton Dana

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LIST OF ACRONYMS/ABBREVIATIONS

AIR	American Institutes for Research
CBAM	Concerns-Based Adoption Model
CTE	Career and Technical Education
DiP	Dissertation in Practice
F2F	Face-to-face
FCAT	Florida Comprehensive Achievement Test
FLVS	Florida Virtual School
FSA	Florida Standards Assessment
ICT	Information, Communications, and Technology Literacy
IEP	Individual Education Plan
IT	Information Technology
LMS	Learning Management System
PEOU	Perceived Ease of Use
PLC	Professional Learning Community
PU	Perceived Usefulness
SoCQ	Stages of Concern Questionnaire

CHAPTER ONE: INTRODUCTION

Background of the Problem

Although society has shifted from the Industrial Age to the Information Age, many schools have retained characteristics of the Industrial Age (Reigeluth & Garfinkle, 1994). As a prominent researcher in the field of educational technology and instructional design, Reigeluth (1997) emphasizes that when all students are held to the same uniform standards despite their range in ability level, this creates an environment where all students are expected to accomplish the same tasks in the same amount of time. Consequently, some standards may be challenging for some students, but may be too easy for others. As a result of this notion, both the low- and high-achieving students may remain held back (Reigeluth, 1997). As a different approach, Watson and Watson (2007) suggest the importance of shifting education from focusing on standardization to learner customization. Watson and Watson explain that learner customization, which can be achieved through the use of technology, seeks to meet all learners' needs and allows students to focus on their own mastery.

Many public school districts in Florida are attempting to successfully make the transition to become 21st century schools. Donovan, Green, and Mason (2014) point out that one of the reasons 21st century learning environments are so hard to achieve is because a range of definitions exists when educators are asked to define 21st century skills. With such an inconsistent definition, it makes it more difficult to verify if true 21st century teaching and learning is taking place in a learning environment (Donovan et al., 2014). As a result, the Partnership for 21st Century Learning (2017), with input from both educators and business

leaders, has developed the “P21 Framework for 21st Century Learning” to define the skills needed for learners to achieve 21st century readiness. According to the framework, these skills include: learning and innovation skills, which include creativity and innovation, critical thinking and problem solving, communication, and collaboration; information, media and technology skills, which include information literacy, media literacy, and ICT (information, communications, and technology) literacy; and finally life and career skills, which include flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. Not only are public schools feeling pressure from the state’s Department of Education to perform highly, but they are also faced with competition from the state’s advancing virtual school. With its founding in 1997, Florida Virtual School (FLVS) became the first statewide online public high school (Martin, 2016). Initially, students enrolled in FLVS to take virtual courses as a supplement to either their traditional high school courses or home-school curriculum (Martin, 2016). It is important to point out that students in the state of Florida are currently required to complete at least one online course in order to satisfy graduation requirements (Online Sunshine, 2017). Additionally, a shift occurred in 2011 allowing students to enroll in virtual school full-time by taking all of their courses online and a more recent initiative has led FLVS to increase their advertising budget with the aim of recruiting even more new students (Martin, 2016). With the increasing pressure and competition, school districts are looking for ways to not only increase rigor in the classroom, but to also help classrooms evolve from a predominant teacher-centered approach to a learner-centered one. The school districts hope to meet all learners’ needs through differentiated instruction and curriculum customization. One such way to empower the learners is by introducing information and communication technologies to the classroom.

One such technology is a Learning Management System (LMS). A LMS can be described as an information system, accessed using a web browser, that offers various tools for a course or training (De Smet, Valcke, Schellens, De Wever, and Vanderlinde, 2016). The system offers instructors or trainers a place to host all of their digital tools and resources for their learners or participants. Additionally, a LMS includes features such as personal and group communication via email, instant message, chat room, or discussion forum; content uploads including access to syllabus and presentation or lecture notes; assessments such as quizzes and tests; and course management, which include grades and attendance (Naveh, Tubin & Pliskin, 2012). First developed in the late nineties, the LMS has seen a stable market rise since its inception (De Smet et al., 2016).

Lochner et al. (2015) point out that a LMS can be updated frequently with new features to enhance both the teaching and learning experience, which, if used as intended, is just one major advantage of teaching with a web-based technology. To illustrate, new features may include items such as parental observation of one or more students in the LMS, increased attendance visibility, and integration of newer resources within the LMS. They also explain how the LMS allows education to extend beyond the walls of a classroom. This is made possible through the use of tools such as “discussion forums, RSS feeds, chats, e-mail, podcasts, and video sharing sites” (Lochner et al., 2015, p. 64). Not only is learning extended, but it also gives the learner a more active role. As an example, the conferencing tools in a LMS allow teachers to implement learning activities that are interactive and focused on the learner (Lochner et al., 2015). This helps allow the learner to take more responsibility for their own learning as it prompts them to take on a more active role in the learning environment. An added benefit of a LMS is progression of a student’s technology skills, which can be essential to his or her future

college and/or career readiness. With these purported benefits, many academic institutions have chosen to invest in various LMSs, such as Blackboard, WebCT, Moodle, and Canvas. Therefore, it is important to investigate teachers' perceptions when using innovative technologies, such as a LMS, so that concerns can be addressed in a timely manner.

Statement of the Problem

In the 2015-2016 school year, the district office of a public high school in central Florida (identified as School A) adopted a new LMS. School A's administration, at a minimum, expected its teachers to upload their course syllabi, course calendar, weekly lesson plans, quarterly projects, announcements, and resourceful links to their course sites. Each course site can be accessed by other teachers, administrators, students, and parents. With all the built-in features and extensions that the LMS offers, it is unknown if teachers are aware of these features and if they know how to use them to enhance their face-to-face teaching in the classroom. In the 2016-2017 school year, School A's district mandated that certain features of the LMS be used and that school administrators check the LMS course sites for compliance. At this time, it is unknown whether or not teachers' course sites are in compliance. It is also unknown how teachers use the LMS in their classroom and whether or not students are actively engaged by the teaching tool to the point where it enhances their academic performance. This is important because a student's attitude toward a technological tool can be just as important as the tool itself: Research shows that "perceived usability [of technology] affects greatly student's learning effectiveness and overall learning experience, and thus is an important requirement of educational software" (Orfanou, Tselios, & Katsanos, 2015, p. 227). Technology in the

classroom does not only impact the teachers and the students, but also other stakeholders including the parents and administrators.

With the adoption and subsequent implementation of new innovations in the classroom, George, Hall, and Stiegelbauer (2006) stress the importance of identifying what happens to stakeholders (i.e., teachers) since change begins with these individuals. They explain that by first identifying what happens to an individual when he or she is presented with change, any needs of the individual can then be sufficiently identified and addressed. They also emphasize that this process can ultimately help an innovation achieve its desired outcome. With the LMS adoption at School A, it is unknown how the innovation is affecting the teachers. In other words, the teachers' perceptions and concerns regarding their LMS use have not been identified. Are teachers receiving adequate support, resources, and professional development in order to implement the LMS effectively in their classrooms? Are teachers proficient enough to execute the technological tasks that the district expects of them? Are teachers genuinely interested in using the LMS in their curriculum? Are teachers collaborating with their colleagues and sharing ways they are using the LMS? Investigating these and other concerns is one way to help the district achieve its overall vision of creating customized learning that prepares its students for 21st century work.

One of the potential problems addressed in this study is insufficient professional development and training for teachers when it comes to teaching with a LMS. De Smet et al. (2016) found that "the most cited barrier to successful ICT [Information and Communication Technology] integration, is a lack of teacher professional development" (p. 33). Gunter and Reeves (2016) point out that "Although research clearly suggests that most current methods of teacher training for technology integration (i.e., one-off, short workshop-like) and mobile

learning are insufficient (Gunter & Gunter, 2015), not too many school districts, colleges or universities to date have attempted to reform their current professional development practices. This may be attributed to a variety of factors, among them time and budget constraints” (p. 11). As a result, it is important to investigate the quality of the professional development for the LMS that has been provided to teachers. This would include a thorough exploration of the existence and quality of teacher training courses, pedagogical support, the role of the school administration in leading LMS use, and even technical support (De Smet et al., 2016).

This is a problem within the context of the organization because it may be affecting the teachers’ ability to teach effectively as well as the students’ ability to learn effectively. This then interferes with the school’s ability to fully achieve its mission as well as the harboring district’s mission. In order to provide their students with a flexible and relevant curriculum, teachers can turn to technology. Watson and Watson (2007) stress that technology can help move schools from the Industrial Age mentality to one of the Information Age by helping customize the learning process for learners individually. They explain that technology can also help accomplish a number of tasks such as tracking learners’ progress toward mastery of a learning goal, assessing student learning, and helping teachers scaffold and modify the curriculum. These tasks can be accomplished through the use of an LMS (Watson & Watson, 2007).

In addition to customizing learning, a LMS can be accessed anytime and anywhere there is access to the Internet (Walker, Lindner, Murphrey, & Dooley, 2016). Walker et al. (2016) state that a LMS can provide a consistent method for content delivery and evaluation, and a good return of investment if it is implemented properly. They clarify that one way to ensure proper implementation of a LMS as well as user buy-in is by listening to the LMS users (e.g., students

and instructors) and taking into consideration their concerns. Whether or not the money and resources School A's district has invested in the LMS is being used wisely is currently unknown.

Purpose of the Study

The purpose of this study is to investigate the current teacher perceptions, concerns, and integration of a LMS by secondary classroom teachers at School A. From this investigation, perceived obstacles or inefficiencies to using the LMS, if any, will be identified. These obstacles will then be addressed in the form of proposed recommendations. Ultimately, the findings from this study will be used to improve the overall implementation of the LMS at School A. There are many benefits to learning with the use of an LMS (Naveh et al., 2012), but it is unknown whether or not School A teachers are using the LMS platform to its full potential with their students. As part of the formative process evaluation plan, the following elements are being studied:

1. The extent of LMS use by teachers in the classroom
2. Aspects of the LMS that teachers want to know more about using in their teaching
3. Perceived barriers teachers face (if any) when it comes to using a LMS in the classroom
4. Components of a LMS that teachers report as working well and components teachers report as needing improvement (if any)
5. Needed resources for teachers to be successful with their LMS use in the classroom

6. Appropriate resolutions to teachers' concerns with use of the LMS and interventions to improve application of the LMS

Evaluation Questions

The following evaluation questions were used to guide this study:

1. According to the Concerns-Based Adoption Model, what stage(s) of concern (regarding the LMS) do teachers perceive to be the most intense?
2. What are teachers' reactions to and perceptions of the implementation of the LMS?
3. According to teachers, in what ways is the LMS successfully implemented by teachers?
4. According to teachers, what are internal and external factors, if any, impacting the use of the LMS?
5. According to teachers, what are the ways the implementation of the LMS could be improved?
6. What are the most important unresolved concerns for teachers (regarding the LMS) and how might they be resolved?

Theoretic Framework

Proposed by Hall, Wallace, and Dossett (1973) and later modified by Hord, Rutherford, Huling-Austin, and Hall (1987), the Concerns-Based Adoption Model (CBAM) is a research-based framework that seeks to aid innovations. By first striving to understand how various

stakeholders (such as teachers) react to change, the concerns that are raised can then be addressed (Holloway, 2003). The CBAM and its tools may have been developed in the 1970s, but it remains relevant today (George et al., 2006). George et al. (2006) assert that the Stages of Concern Questionnaire (SoCQ), one of the model's diagnostic tools, has widespread use in many educational studies, including doctoral dissertations, and it has even been utilized in industrial settings. This model includes seven levels of change: Unconcerned, Informational, Personal, Management, Consequence, Collaboration, and Refocusing (Khoboli & O'Toole, 2012), which can be grouped into four clusters: unrelated concerns, self-concerns, task concerns, and impact concerns (Lochner et al., 2015). Lochner et al. (2015) state that in the Unconcerned stage, an individual is aware of the change or innovation but has limited knowledge of it. In the Information stage, an individual is becoming familiar with the innovation and evaluating its effectiveness and usefulness (Khoboli & O'Toole, 2012). Khoboli and O'Toole (2012) explain that the Personal stage is entered into when an individual expresses concerns over how the innovation impacts him- or herself and when the individual expresses concerns over his or her personal skills. When an individual becomes concerned with the innovation's efficiency and implementation, he or she has entered the Management stage (Lochner et al., 2015). In the Consequence stage, an individual may be interested in knowing how the innovation affects others. For instance, Holloway (2003) clarifies that a teacher may begin to question how the innovation affects his or her students or the school. She then explains that the Collaboration stage occurs when an individual considers working with colleagues to bring about effective change with the innovation. In the final stage, which is known as the Refocusing stage, Holloway states that an individual is more concerned with refining the innovation so that student learning is improved with measurable results.

Significance of the Study

With our society's entrance into the Information Age, paradigm shifts are occurring in various societal systems in ways that are antiquating our current educational system (Reigeluth & Garfinkle, 1994). Reigeluth and Garfinkle (1994) assert the necessity for all societal systems (e.g., communication, transportation, family, and workplace) to keep up with the paradigm shifts—meaning shifts in education are also necessary. The researchers have observed the United States' educational performance declining since the 1960s despite educational costs rising, which could signal hesitation on the schools' part to change (especially in the K-12 sector).

Another major change impacting our society was the Digital Revolution. Beginning in the late 1950s and 1970s, the Digital Revolution was “the development of technology from mechanical and analog to digital” (What Was the Digital Revolution?). With the advent of digital technology came the possibility to access information instantly—forever changing the way humans communicate (What Was the Digital Revolution?). This revolution helped lead the way to the Information Age.

Schools were not immune to the tremendous changes taking place in the world. With the need to transform the traditional classroom by allowing students the time they need to achieve mastery of learning concepts, making instruction more learner-centered, helping teachers take on a facilitator role, and changing the learning process to be more individualized for each learner, technology, such as the LMS, must assume an integral role (Watson & Watson, 2007). Yildirim, Reigeluth, Kwon, Kageto, and Shao (2014) point out that use of the LMS is promising because it can be used to facilitate learner-centered instruction. According to Watson and Watson (2007), the key to helping the LMS reach its full potential can be found in the stakeholders: “Perhaps the greatest possibility for improving these technologies lies in the hands of learners, teachers, and

other stakeholders in the current educational system” (p. 32). They assert that researchers and educators can begin improving the LMS by studying the implementation and effectiveness of the educational tool and that it should be the goal of the studies to identify what features the tools offer as well as what features users’ need.

Online learning can offer a multitude of advantages for K-12 education including, but not limited to, allowing students to enroll in classes they may not have been able to take in a face-to-face setting and connecting students to more advanced courses as well as courses that may be better suited to their needs (Picciano & Seaman, 2007). The results of this study can assist teachers by identifying their perceptions and concerns when it comes to teaching with a LMS so that any issues can be resolved to improve use of the technology to enhance learning. The results of this study are especially significant because students in the state of Florida are required to complete at least one online course in order to satisfy a graduation requirement (Online Sunshine, 2017). With this requirement standing in between most Florida students and their high school graduation, it is essential that the online courses offered are taught in a quality manner by effective instructors. As such, taking the time to listen to the instructors to understand their needs is a must.

Limitations of the Study

As with all studies, this formative process evaluation has several limitations. First, the study is built heavily on teacher perceptions and concerns as expressed during surveys and interviews—not necessarily on actual teacher behavior. The study was limited to 36 secondary teachers of a public high school in central Florida who volunteered their time to participate, so

the findings may not be generalizable to a larger population. Data was collected in a short period of time after approval from all appropriate committees was obtained. This particular study relied heavily on self-report and focused on teachers who specifically use a LMS to supplement their face-to-face instruction as opposed to using it to teach a solely online or blended course. Students, parents, administrators and district members were not consulted during this study. Finally, the evaluator was familiar with the school selected and with the teachers who participated.

Assumptions of the Study

While completing the formative process evaluation, some assumptions were made. First, it was assumed that the study participants were representative of all secondary teachers using a LMS at School A. Second, it was assumed that the results of the surveys and interviews included honest responses from the participants. Third, it was assumed that the participants' responses reflected their own perceptions and ideas—not those of any administrator or supervisor. To help encourage honest responses, anonymity was upheld in the survey collection, confidentiality was upheld in the interview process, and participants were welcome to withdraw from the study at any time with no ramifications. Fourth, and finally, it was assumed that a LMS is generally accepted and will have longevity in secondary education. The school district of School A has invested in a LMS and strives to offer its students a flexible and relevant curriculum to ultimately prepare them to be productive citizens.

Definition of Terms

Specific terminology of this study is defined below:

Asynchronous learning environment: courses and/or trainings that feature “settings where the students engage in activities that occur independently from the instructor or other peers” (Coogle & Floyd, 2015, p. 173).

Face-to-face (F2F): learning that occurs with the instructor and students in person and in real time.

Hybrid course: courses and/or trainings that come in many forms. “Some course meetings are synchronous, while other activities are completed independently or asynchronously” (Coogle & Floyd, 2015, p. 173). Also known as a blended or mixed-mode course.

Learning Management System (LMS): refers to a platform or software program that delivers an educational course or training program over the Internet. Often includes features that allow for course organization and management, such as delivering course content and assigning course grades. It is accessed through users’ browsers and/or mobile applications.

Synchronous learning environment: a learning environment that includes “settings where learning is occurring in real time and might incorporate activities such as an instructor lecture, collaborative activities, and student questions. All members of the course are logged on at the same time each class meeting” (Coogle & Floyd, 2015, p. 173).

CHAPTER TWO: LITERATURE REVIEW

Introduction

Today's employers are in need of highly-skilled high school and college graduates. According to the CEO Forum (2001), graduates need certain 21st century skills. Specifically, Eisner (2010) states that these skills are:

...[E]ffective communication (teamwork/interpersonal/collaboration, personal/social responsibility, interactivity), digital age literacy (basic, scientific, and technical; cultural literacy and global awareness), inventive thinking (adaptability/managing complexity, curiosity/creativity/risk taking, higher order thinking/sound reasoning), and high productivity (prioritizing/planning/managing for results, using real-world tools effectively, creating relevant high-quality products). (p. 30)

Malm and DeFranco (2012) point out that both secondary and post-secondary learning institutions are striving to enhance their curriculum with technology by investing a lot of financial and human resources into many technology tools but especially LMSs. The LMS software can be used in a variety of educational settings, including face-to-face (F2F), online, or blended (both F2F and online) courses. They share that it is quite common for campuses nowadays to have at least one LMS as well as information technology (IT) staff, training programs and/or resources, and the necessary hardware. They also describe the LMS as the “keystone in a technology-based learning strategy” (Malm & DeFranco, 2012, p. 401) and both admit that although there has been much research on the benefits of using an LMS in education, there has not been much research on the actual utilization of the LMS. Hence, the purpose of this study is to conduct a formative process evaluation to explore teacher perceptions, concerns, and

integration of a LMS in a K-12 public school with the goal of improving the implementation of the LMS.

K-12 and Online Learning

Students in the state of Florida are currently required to complete at least one online course in order to satisfy a graduation requirement, which makes studying online education especially important to high schools in Florida as well as high schools in other states with similar graduation requirements. Under the heading, “Online Course Requirement,” the Florida statute states that “at least one course within the 24 credits required under this section must be completed through online learning” (Online Sunshine, 2017, n.p.). The statute further explains that students may take an online course offered by Florida Virtual School (FLVS) in grade 6, grade 7, or grade 8 to meet this requirement. Other ways to satisfy the requirement, as discussed in the statute, would be by completing a course that earns a nationally recognized industry certification in information technology, by passing an information technology certification examination, or by passing an online content assessment to meet the requirement. The statute emphasizes that students are not required to take the online course outside of their normal school day nor in addition to their courses for a given semester. The statute points out that students with Individual Education Plans (IEPs) and students transferring from out-of-state schools may be exempt from this requirement. With online learning set as a graduation requirement, it is important that both teachers and students are able to successfully use a LMS. This ability is such an important component that the International Association for K-12 Online Learning (iNACOL), an organization charged with providing guidelines for quality in online teaching, specifically

mentions the LMS in one of their standards. Under Standard K, one of the guidelines states, “The online teacher is able to modify and add content and assessment, using an online Learning Management System (LMS)” (International Association for K-12 Online Learning, 2011, p. 16). The LMS is a vessel that delivers online content, so users must know how to operate the vessel itself.

Even if online education is not a graduation requirement, Lips (2010) stresses the many advantages that online learning has to offer K-12 education. According to Lips (2010), virtual or online learning can increase educational opportunities of students since this type of learning can overcome any geographic boundaries or even demographic limitations. He also states that virtual learning can improve the overall quality of instruction. Finally, Lips states that virtual learning is valuable because it has the power to increase productivity while lowering instructional costs that are the responsibility of taxpayers. With such strong benefits of online learning as identified by Lips, it is important to study the perceptions of online education users so that any problems may be addressed.

Other advantages of online learning in K-12 schools were investigated by Picciano and Seaman in their 2007 study. As one of the first studies to collect data on fully online and blended learning in K-12 schools, Picciano and Seaman (2007) found a number of qualities of online learning that their participants perceived as important. Their findings mentioned that online learning allowed schools to offer courses that may not have been otherwise available, helped meet the needs of certain students, helped schools offer college-level courses, helped reduce scheduling conflicts, and allowed students the opportunity to retake a failed course. If virtual and online learning is not carefully studied, it may be riddled with issues that hinder its overall potential.

The “Online Report Card: Tracking Online Education in the United States,” set out to document online education in U.S. higher education since higher education has been a leader in adopting online education (Allen, Seaman, Poulin, & Straut, 2016). One of the fundamental questions the report aims to answer is how many students are learning online. The 2016 report found that distance education continues to grow despite the decline in higher education enrollments. Another fundamental question the report focuses on is whether or not online learning outcomes are comparable to face-to-face instruction. The report found that, in 2015, 71.4% of academic leaders rated the learning outcomes of online education as either the same or superior to those in face-to-face instruction. The report also notes that academic leaders hold more positivity for learning outcomes of blended instruction rather than for online education. Use of a LMS can support face-to-face, blended, or fully online courses.

Formative Evaluation Design

What is Evaluation?

Best known for his contributions to the field of evaluation, Michael Scriven (1998) explains that, “[e]valuation is the process of determining the worth, merit, or significance of entities; and evaluations are the outcome of that process” (p. 85). Fitzpatrick, Christie, and Mark (2009) identified four different purposes of evaluation: (a) determine the merit of a program or policy; (b) oversee and identify if an organization complies with specific agreements; (c) improve how a program is performing; and (d) expanding our knowledge of a program or policy. They also indicated that needs assessment studies, process or monitoring studies, outcome or impact studies, and descriptive studies are all versions of evaluation. In his 1967 work, Scriven

first identified a distinction between two categories of evaluation: summative and formative. Summative evaluation is used to decide whether or not a program should be implemented, sustained, or expanded whereas formative evaluation is used to decide how to make improvements to a program or policy (Fitzpatrick et al., 2009). Formative evaluation occurs when a product is assessed at the same time the product is being developed to improve the quality of the product and to ensure that the product is being used as intended (Beyer, 1995).

What is Formative Evaluation?

In contrast to summative evaluation, which has a judgmental role, the intention of formative evaluation is to promote the development or improvement of a program or product (Scriven, 1967). Trochim (2006) asserts that formative evaluation design is intended to “strengthen or improve the object being evaluated” (n.p.). In educational settings, a formative evaluation can monitor how well instructional goals are being met. This can be done by “examining the delivery of the program or technology, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, inputs, and so on” (Trochim, 2006, n.p.). Beyer (1995) identifies three key features of formative evaluation: (a) it is ongoing throughout various stages of development; (b) it assesses how well the product meets its objectives; and (c) it seeks feedback for product improvement and not for the purposes of grading or giving a score.

What is Process Evaluation?

Process evaluation is considered a form of formative evaluation. Conducted regularly throughout the program’s existence, process evaluation is used to understand why a program is or is not successful with the aim of improving future program activities. By focusing on program

implementation, process evaluation has the following uses: (a) to uncover why a program may have changed with time; (b) to combat any program inefficiencies; and (c) to inform outside parties of the program's day-to-day operations (The University of Minnesota, 2017). A process evaluation seeks to identify the degree to which a program has reached its target population (Kiernan, 2001).

Why is a Formative Process Evaluation Used?

According to Beyer (1995), formative evaluation is used in curriculum or instructional development because it is practical and cost-effective. He states that conducting a formative evaluation may lead to the discovery of product workability, consequences, and user-friendliness. In other words, the formative evaluation of the product can reveal how capable intended users are of executing any associated activities or tasks, any unanticipated consequences of product use—negative or positive, and the user-friendliness of the product (Beyer, 1995).

Beyer (1995) mentions that one such evaluator in the process of formative evaluation is the user of the product; a primary user is one that will use the product with the aim of realizing the product's objectives. For instance, Beyer states that an instructor would be a primary user of a new educational product, such as a computer learning program. He recommends that, when selecting primary users, it is essential that they have differing levels of experience and abilities (e.g., novice and experienced users). A novice user is a beginner user while an experienced user has either used the product or similar products in the past; therefore, utilizing all users of various ability levels can help an evaluator garner useful feedback about a product (Beyer, 1995). Finally, Beyer indicates that this feedback can be acquired through various methods including

questionnaires and interviews. Since the purpose of this study was to improve the overall implementation of a LMS, a process evaluation would help determine if the actual program strategies were executed as planned (The University of Minnesota, 2017).

Intended Benefits of a Learning Management System

Student Benefits

When used as intended, there are numerous benefits that a LMS can offer students. An empirical study by Naveh et al. (2012) found that students believed a course website, when complete with course content, was supportive of traditional teaching processes and helped them perform well on course assignments and even assessments. In a 2014 study of how the needs of instructors are met by classroom management software, such as Moodle, and why instructors are slow to implement these technologies, Ackerman, Chung, and Sun reported that the software “provides a common ground for communication in cyberspace” (pp. 317-318). Files can be exchanged seamlessly between instructor and students and students even have multiple ways to communicate with one another from group messages to discussion boards. In their 2015 study, Chung and Ackerman examined the perceptions of students regarding the adoption and usage of the LMS Moodle and investigated how the students’ learning styles affected their reactions to Moodle. The researchers found that use of a LMS can affect both the structure and flow of an entire course and how an instructor implements the LMS can affect the student’s overall learning experience. Finally, it is worth mentioning that Coogle and Floyd, in their 2015 study exploring student perceptions as they interacted with synchronous and asynchronous learning environments, found that students enjoy the flexibility afforded in an asynchronous learning environment since it allows them to work at their own pace. This could allow the higher-

achieving students to work ahead while also allowing the lower-achieving students to review content and revisit modules as often as needed.

Teacher Benefits

Ackerman et al. (2014) noted that the use of a LMS gives teachers the opportunity to upload content, such as study guides, or create online content enhanced with multimedia, which can increase student performance and engagement, and then easily deliver it to their students. They also noted that a LMS can give instructors the ability to track and monitor students and their progress especially through the use of online assignments, quizzes, and tests. Finally, a study by Lochner et al. (2015), which investigated the concerns of secondary teachers regarding the adoption of LMSs, drew attention to the important role that teachers have when it comes to adopting and implementing an educational innovation, such as a LMS. Consequently, school leaders and technology facilitators must consider the teacher perspective both before and during implementation of a LMS (Lochner et al., 2015).

Barriers to Benefits

Although there are many potential benefits of using a LMS, there are many obstacles that teachers encounter that may hinder the effectiveness of a LMS. Before discussing the barriers that affect teachers, it is important to consider the student perspective once again.

Student Barriers

When it comes to embracing new technology, students can be much faster than teachers; however, it does take more time and effort to create a course rather than to navigate one (Ackerman et al., 2014). In the study by Naveh et al. (2012), students interviewed expressed

disappointment in using a LMS when it came to ease of access. More specifically, they mentioned dissatisfaction when required to log-in to the site using their usernames and passwords. They were also dissatisfied with the following characteristics of the course site: slow response times, slow download times, and the inability to open more than one window at a time. Overall, this study considered student satisfaction as an indication of LMS success and aimed to provide a lens of critical success factors to investigate LMS effectiveness.

Teacher Barriers

On the other hand, when it comes to embracing new technology, teachers can have some concerns. Some teachers can even be reluctant and/or fearful. Teachers will naturally question the benefits and advantages their students would obtain from using a technological tool—just as they would question any new educational resource (Ackerman et al., 2014). Picciano and Seaman (2007) acknowledged in their study that small school districts may have difficulties expanding their online education because their teaching staff may be very traditional and those teachers may not be encouraging students to utilize online education. This traditional faculty may fail to recognize that today's students are becoming more and more nontraditional, especially those students enrolled in college (Complete College America, 2011). In a report titled, "Time is the Enemy," Complete College America stresses that failure to recognize who students are and how they are performing can deeply hurt students' success rate and their ability to graduate from college. This makes it even more important to provide teachers with adequate time and proper training to adjust to the new technology. Gunter and Gunter (2015) noted that extensive teacher training and the time to develop technology skills is crucial for teachers to become proficient at using a technology. They stated that, "Teachers and administrators...can and are beginning to

overcome these barriers with effective leadership, proper training, planning and a commitment to enhancing teaching and learning using technology” (p. 217).

Despite teacher hesitation, Kennedy and Archambault (2012) highlight that K-12 student enrollment in online learning has grown exponentially in the United States. They reveal that students are enrolling in fully online, blended, or hybrid courses to satisfy all or part of their education. Additionally, they emphasized that some students live in states that require an online component for students to successfully meet graduation requirements.

With online learning growing at exponential rates, it is crucial to examine the factors necessary for online learning to be effective: “Successful adoption of innovations rests on the teachers’ understanding and interpretation of the value of such innovations to facilitate and enhance their students’ educational experiences” (Lochner et al., 2015, p. 65).

Workarounds

As with most obstacles, there are a few workarounds suggested by Ackerman et al. (2014). They point out that instructors’ fears of a new technology can be alleviated by offering user-friendly functions and easily accessible technical support. One way to help avoid procrastination would be by allowing instructors time off to learn the new software and get started implementing it (Ackerman et al., 2014).

Theoretic Framework

With the aim of selecting theoretical frames surrounding this study, several works were consulted. First and foremost, the Concerns-Based Adoption Model (CBAM) was used to gather the quantitative data in the formative process evaluation study. More specifically, the model

provided a useful tool to measure teachers' concerns. The model also aided the evaluator in identifying the most effective ways to then resolve participants' concerns. Other frameworks consulted in this formative process evaluation included Davis' Technology Acceptance Model (TAM) and Bandura's self-efficacy theory. Both of these theories helped explain the evaluation's findings so that appropriate recommendations could be made to refine the implementation of the LMS.

Concerns-Based Adoption Model (CBAM)

A theoretic framework with participants' concerns at its core is the Concerns-Based Adoption Model (CBAM) (Lochner et al., 2015). Originally proposed by Hall, Wallace, and Dossett (1973) and then revamped by Hord, Rutherford, Huling-Austin, and Hall (1987), this model can be used to help identify teacher concerns when it comes to a technological innovation, such as LMS adoption (Lochner et al., 2015). The CBAM is graphically depicted in Figure 1.

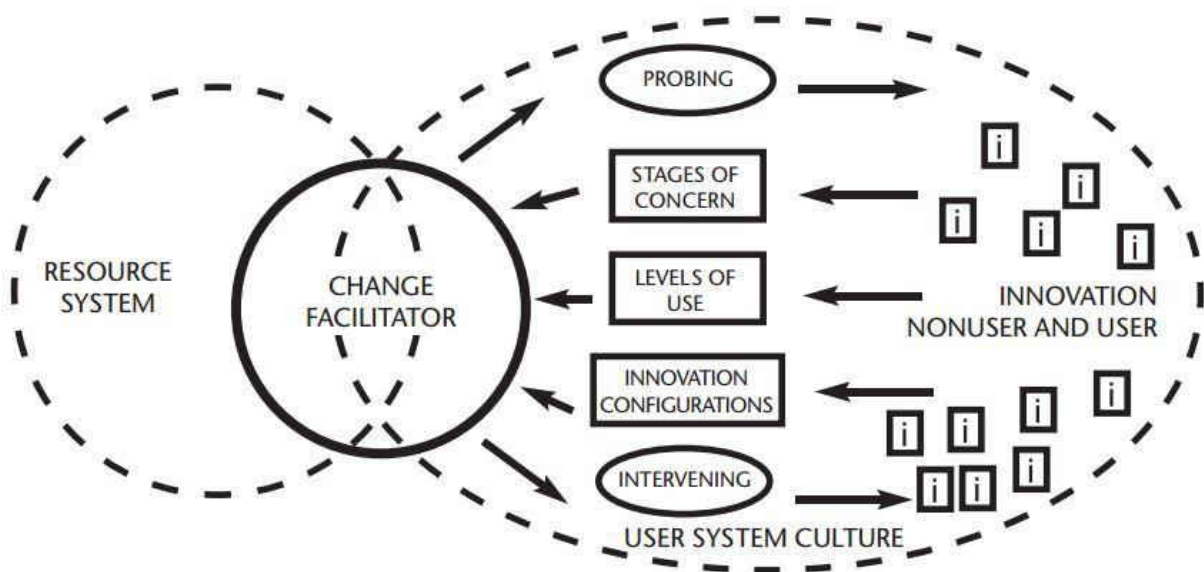


Figure 1. The Concerns-Based Adoption Model. Copyright 2006 by the Southwest Educational Development Laboratory. Reprinted with permission.

Hall et al. (1973) stressed that such a model is needed because adoption of innovations in education is a complex process since teacher use of an innovation at a school may be inconsistent from classroom to classroom and sometimes the innovation is unused or not used in the manner in which it was intended. Additionally, they state that there are developmental stages in the use of an educational innovation and these stages must be attended to in order for adoption of the innovation to be effective. Some of the changes that may occur, as a result of innovation adoption, include, but are not limited to, role changes for users (which then require new professional and interpersonal skills), creation of new organizational structures, creation of new organizational priorities, and a change in criteria for success or even rewards (Hall et al., 1973).

Hord et al. (1987) share a number of conclusions regarding change: First, change is a process that occurs over a period of time; it is not a single event. Second, change is achieved by individuals since change affects people. Third, change affects individuals in different ways. Not all individuals will respond to change in the same manner. As such, change is successfully achieved when individuals are equipped with interventions that suit their particular needs. Fourth, individuals faced with change express growth in terms of their feelings and skills. Fifth, individuals relate to change by questioning how the change will affect them. Finally, individuals involved in or affected by an innovation should be the focus—not the innovation itself—since people bring about change by modifying their behavior.

The Stages of Concern

George et al. (2006) explain that the CBAM features seven stages of concern: Unconcerned, Informational, Personal, Management, Consequence, Collaboration, and Refocusing. They also point out that the seven stages can then be divided into four categories or

clusters (that were abstracted from Frances Fuller's research): unconcerned, self, task, and impact. They share that, in 1969, Fuller put forth a developmental conceptualization of teachers' concerns, and in her developmental sequence, the concerns appear on a continuum that goes from self to task to impact. They also indicate that concerns that are typical in change process and concerns typical in an innovation's adoption can be grouped in the same clusters. A summary of the meaning of each stage is described in Table 1 (George et al., 2006).

Table 1

The Meaning of the Stages of Concern

Category	Stages of Concern		Meaning
Unconcerned	0	Unconcerned	An individual expresses little to no concern about an innovation. He or she has little involvement.
Self	1	Informational	An individual has an overall awareness of the innovation and has a neutral interest in it. He or she is not concerned about what the innovation entails for him- or herself.
	2	Personal	An individual is unsure of what the innovation demands or requires. He or she is unsure of his or her own ability to meet those demands. He or she is also unaware of his or her role with the innovation. At this stage, an individual is taking into account any potential conflicts the innovation may have with existing structures or commitments.
Task	3	Management	An individual concentrates on the processes and tasks associated with use of the innovation. He or she is focused on issues of efficiency and scheduling.
Impact	4	Consequence	An individual considers how the innovation would impact others. For instance, a teacher would pay attention to how the innovation would impact his or her students, and question the relevance of the innovation for his or her students.
	5	Collaboration	An individual fixes on coordinating and collaborating with others on the use of the innovation.
	6	Refocusing	An individual seeks ways to gain more benefits from the innovation. He or she may also consider making changes to or replacing the innovation.

Stages of Concern Questionnaire (SoCQ)

The CBAM provides researchers with a Stages of Concern Questionnaire (SoCQ), which is a heuristic and diagnostic tool to measure the concerns felt by individuals facing change (Lochner et al., 2015). George et al. (2006) explain that the SoCQ contains a total of 35 statements that respondents react to using a Likert scale (see Appendix F). The scale is 0-7 with 0 being “irrelevant” and 7 being “very true of me now.” Therefore, high numbers represent a high concern whereas a low number either represents a low concern or no concern due to irrelevancy. Respondents are given directions before taking the survey and are informed to think about their present concerns in regards to a specific innovation—in this case, the LMS. After completing the 35 items, respondents are faced with four additional questions to examine how long they have been involved with the innovation, what they consider their proficiency level to be when it comes to use of the innovation, whether or not they have received formal training regarding the innovation, and whether or not they are involved with any other major innovations at the same time. Lastly, respondents complete items to gather demographic information, which may provide valuable information to explain an individual’s concern profile after his or her survey has been scored (George et al., 2006).

Technology Acceptance Model (TAM)

Developed by Fred Davis, the Technology Acceptance Model (TAM) seeks to explain how people come to use a technology (Chung & Ackerman, 2015). Davis’ model has two main components: perceived usefulness (PU) and perceived ease of use (PEOU). When a user is faced with using new technology, PU measures how much the user feels the new technology would help with his or her job or improve his or her task performance (Chung & Ackerman, 2015).

PEOU measures how much effort the user feels the new technology would require (Davis, 1989). Davis (1989) clarifies that these components are important to consider since they are measures that seek to predict and explain a user's technology use.

In an effort to improve user acceptance of technology through the design of effective training interventions, Venkatesh and Davis (1996) endeavored to understand the determinants of PEOU. They revealed that one's general computer self-efficacy is a determinant of PEOU, and that this was applicable both before and after one's hands-on use of the technology. "According to TAM, perceived usefulness is also influenced by perceived ease of use because, other things being equal, the easier the system is to use the more useful it can be" (Venkatesh & Davis, 2000, p. 187).

Although advances in both hardware and software were occurring at a rapid rate, Venkatesh and Davis (2000) noted the ongoing issue of underutilization of technological systems. As such, they later strived to understand the determinants of PU. They found that social influence processes (such as subjective norm, voluntariness, and image) significantly influenced PU. It is necessary to include Venkatesh and Davis' (2000) definitions of the social influence processes to better understand their influence. First, subjective norm is defined as one's perception of whether others feel he or she should use the technology. Second, voluntariness is defined as the degree to which one perceives the adopted technology to be voluntary or non-mandatory. Finally, image is defined as one's perception of how the adopted technology could enhance his or her own social status. The researchers share that these findings led to an updated model known as TAM2.

In the TAM2, or the extension of the technology acceptance model, Venkatesh and Davis (2000) reveal that a number of other variables must also be considered. They explain that PU

was likewise influenced by job relevance, output quality, and result demonstrability. They define job relevance as one's perception of the level to which the technological system is pertinent to the user's job. They define output quality as one's perception of how well a technological system can perform specific tasks. Finally, they define result demonstrability as one's perception of the tangible benefits that result from using the technological system. Additionally, they share that another variable that influenced not only PU but also one's intention to use a technological system is one's experience with the technology (2000).

Self-Efficacy Theory

Self-efficacy theory, developed by Albert Bandura, is one's belief in his or her ability to learn or accomplish a task (Chung & Ackerman, 2015). There are two different types of self-efficacy that are relevant in educational technology: academic self-efficacy and Internet self-efficacy. Chung and Ackerman (2015) explain that academic self-efficacy is one's belief in his or her academic ability. It encompasses how confident one is in accomplishing an academic task or goal such as studying or getting into college. Internet self-efficacy is one's belief in his or her ability to accomplish a task on the Internet either now or in the future (Lai, 2008).

In this study, Internet self-efficacy is especially relevant because it may influence teachers' perceptions when it comes to using a LMS in the classroom (Chung & Ackerman, 2015). According to Tsai and Tsai (2003), a criterion for teachers to deliver effective Internet-based instruction is sufficient confidence in their use of the Internet. Equally important as one's ability in him- or herself to complete a task is his or her attitude toward the task itself: Wu and Tsai (2006) note that an appropriate attitude is also a prerequisite for one to successfully deliver Internet-based instruction.

Alternatively, it is important to take Internet self-efficacy into consideration since it also applies to the students who use the LMS in their learning process. In researching the effect of self-efficacy beliefs on academic functioning, Bandura (1996) raised a concern associated with educational self-development and educational technology:

Another important educational implication concerns the paramount role of self-regulatory influences in educational self-development. Schools try to equip students with the intellectual tools, agentic self-beliefs, and self-regulatory capabilities to educate themselves throughout their lifetime. The accelerated pace of technological change and growth of knowledge are placing a premium on capability for self-directed learning. In the not too distant future, students will be educating themselves increasingly with multimedia instruction presented electronically by master teachers outside the confines of the school. The knowledge gap will widen between good and poor self-directed learners. (p. 1219)

This shows how important it is for researchers and educators to study self-efficacy when it comes to self-directed learning, which is commonplace in educational technology.

Summary

With today's graduates in need of certain 21st century skills (CEO Forum, 2001), a LMS can help prepare graduates to be both college- and career-ready. In order for a LMS to have a successful impact, teachers—the ones charged with using a LMS—hold a big role. Research on the concerns of teachers adopting a LMS is becoming more common; however, research must be conducted on teacher perceptions throughout the adoption and implementation processes of this

innovation. Holloway (2003) recognizes that each and every stakeholder (e.g., administrators, teachers, students, and parents) harbors his or her own set of personal concerns when faced with a new program or change. She states that ignoring these concerns would be detrimental to the innovation's overall success. Instead, she advises researching the stakeholders' concerns to allow the innovation's implementers to customize support and resources given to those affected. Holloway suggests that this research be done through the CBAM as this model provides a way to first understand and then focus on individuals' concerns when it comes to a change process. Other theoretic frameworks that come into play as teachers use a LMS are the TAM and Internet self-efficacy. The TAM includes two main components, PU and PEOU, to understand and predict a user's technology use (Davis, 1989). Internet self-efficacy is one's belief in his or her ability to accomplish a task on the Internet either now or in the future (Lai, 2008). One's belief in his or her ability can greatly impact how a technological innovation is used.

A LMS offers many benefits to its users—especially in the realm of education. However, with so many potential barriers that exist, research on how to reduce these barriers is necessary, which is why this study seeks to examine teacher perceptions, concerns, and integration of a LMS. By identifying any potential barriers that teachers face when it comes to using a LMS, appropriate support and resources can be provided to the teachers in a timely manner.

CHAPTER THREE: METHODOLOGY

Introduction

This chapter describes the research design and procedures that were used to evaluate secondary teachers' perceptions, concerns, and integration of a LMS. Additionally, descriptions of the design of the study, evaluation questions, population and sample, instrumentation, data collection procedures, and data analysis procedures are included.

Evaluation Questions

The following evaluation questions were used to guide this study:

1. According to the Concerns-Based Adoption Model, what stage(s) of concern (regarding the LMS) do teachers perceive to be the most intense?
2. What are teachers' reactions to and perceptions of the implementation of the LMS?
3. According to teachers, in what ways is the LMS successfully implemented by teachers?
4. According to teachers, what are internal and external factors, if any, impacting the use of the LMS?
5. According to teachers, what are the ways the implementation of the LMS could be improved?
6. What are the most important unresolved concerns for teachers (regarding the LMS) and how might they be resolved?

Design of the Study

This study used a formative process evaluation design to improve secondary teachers' use of a LMS. More specifically, this evaluation aimed to look at the implementation of a LMS at School A. In order to accomplish these tasks, the study's evaluator aimed to gather information about teachers' perceptions, concerns, and integration when it comes to using a LMS to enhance their face-to-face courses. Evaluation of the current implementation of a LMS was intended to assist in creating interventions that address teachers' concerns and needs to ultimately help them use a LMS more effectively with their students.

To help identify the relationships among LMS resources, planned activities and the changes desired as a result of the evaluation, a logic model has been created (see Appendix P). The logic model describes the resources, activities, outputs, outcomes and impact of the LMS. Resources include all of the LMS's assets; activities include interventions; outputs include the evidence that the aforementioned activities were performed as intended; outcomes include benefits of the LMS; and impact includes long-term changes that will occur as a result of LMS use (The Pell Institute and Pathways to College Network, 2017).

Setting

The school organization that was the setting for this Dissertation in Practice (DiP) is a public high school in Florida that serves approximately 2,200 students from grades 9-12. This school will be referred to as School A. School A's state-assigned grade was an "A" in 2012, 2013, 2014 and 2015, but the school's grade declined to a "B" in 2016. The state-assigned grades were based upon the performance of students on standardized tests in reading, mathematics, and science. A related point to consider is that in 2015, School A experienced changes to state

standardized tests as the Florida Department of Education transitioned from the Florida Comprehensive Achievement Test (FCAT) to the Florida Standards Assessment (FSA).

A new LMS was adopted by School A's district in the 2015-2016 school year. Prior to its adoption, the school had used a different LMS from 2010 to 2015. As part of the district's overall digital plan, it is expected that all stakeholders (e.g., students, parents, and teachers) have 100% participation in the LMS by the end of the 2016-2017 school year. With this movement toward a tech-friendly classroom, the district hopes to see more formative and summative assessments given in a digital format, a decrease in the number of discipline referrals and student absences (due to increased student engagement), and an increase in computer application skills for its students.

School A has access to many organizational resources: the central district office, financial funds, data and information sources, and the physical campus. First, the district office houses many departments including the Teaching & Learning department, which offers professional development and other resources. As a side note, the district office also hosts the county's own virtual school. This allows the district's students, who are required to take at least one online course in order to graduate, the opportunity to take virtual courses offered by the district and/or Florida Virtual School. Second, school funds are fueled by booster clubs and donations as well as A+ money (when ranked as an A school). Third, School A utilizes an online grade book and attendance system (complete with students' historical data, such as attendance, prior test scores, disciplinary records, current and prior class schedules and grades, etc.) as well as another instructional management system (that provides teachers with various student data including at-risk students). As previously mentioned, School A also has access to a Web-based LMS that currently allows School A's students to access course content online. Both School A's

students and teachers are expected to use an online course to enhance each face-to-face course provided at the school. As such, both students and teachers will have now, and in the foreseeable future, a LMS for each course. Finally, School A features ten buildings that are mostly divided up by subject so the same subject area teachers are in close proximity to each other. Each building contains a minimum of two workrooms on each floor, equipped with computers, printers, scanners, Scantron machines, work tables, and book rooms (complete with course texts, for example). Each classroom has, at a minimum, a computer, a projector, an interactive whiteboard, and a document camera.

Year after year, School A is plagued with the issues of teacher attrition as well as poor student attendance. Since the school features a block schedule, one missed period for a student equates to a missed 100 minutes of that class. Making up that amount of work for just one class can be overwhelming to some students to the point where they simply fall more and more behind after an absence. The issue of poor attendance then leads to a domino effect: students' grades are negatively affected and so are their test scores (e.g., SAT/ACT and FSA). When compared to other high schools in the county, School A is often on the bottom in terms of student performance on standardized tests, which suggests that a lack of college readiness for School A students is present. If used as intended, a LMS can help extend the walls of the classroom as it can be accessible to students anytime and anywhere, which can be an advantage on the days they are absent.

Population and Sample

The population that served in this evaluation study was secondary teachers of all disciplines at School A, a public school in central Florida. Collectively, School A teachers cover subjects including, but not limited to, English Language Arts, Mathematics, Science, Social Studies, and electives. There are 125 teachers employed at School A in the 2016-2017 school year. This school was selected because in the 2015-2016 school year, School A adopted a new LMS to allow teachers the means to enhance their face-to-face courses.

All of School A's teachers were invited to volunteer their time in the study by completing an online, anonymous survey administered through Qualtrics. For this evaluation, a total of 36 teachers participated in the survey (yielding a response rate of 28.8%) and three of the teachers surveyed participated in the follow-up one-on-one interviews.

Instrumentation

In this formative process evaluation, the data was gathered through an online survey (see Appendix F). The participants of the survey (which included teachers from School A) were anonymous. Survey questions included dichotomous, Likert-scale, multiple choice, and short response questions. A small portion of the teachers was interviewed one-on-one as a follow-up to the survey.

Online Survey: The SoCQ

The survey distributed in the study was the Stages of Concern Questionnaire (SoCQ) (George et al., 2006). The SoCQ is one of the diagnostic tools originating from the CBAM. Although the Research and Development Center for Teacher Education at the University of

Texas developed the model and its diagnostics in the 1970s, the SoCQ remains pertinent today and has been used in various research studies as well as doctoral dissertations (George et al., 2006). The survey was used in this study to identify teacher concerns about the LMS recently adopted in School A.

The SoCQ can be administered to individuals or groups (George et al., 2006). A link to an online version of the survey was shared with all the current teachers employed at School A in the 2016-2017 school year (see Appendix D). Permission to republish the survey was obtained from American Institutes for Research (AIR) (see Appendix G). Each survey respondent was assigned a number (in sequential order from 1-36) to maintain anonymity. The submitted questionnaires were then hand scored (one by one) by the evaluator (see Appendix K) based on the directions found in the SoCQ manual. To help ensure accuracy of the evaluator's calculations, an external reviewer was used. The external reviewer checked the results, at random, to verify findings.

The SoCQ contains a total of 35 statements that respondents react to using a Likert scale (see Appendix F). There are five statements on the questionnaire for each of the seven Stages of Concern. These statements are mixed up. For example, Questionnaire Items 3, 12, 21, 23, and 30 address Stage 0; Items 6, 14, 15, 26, and 35 address Stage 1; Items 7, 13, 17, 28, and 33 address Stage 2; Items 4, 8, 16, 25, and 34 address Stage 3; Items 1, 11, 19, 24, and 32 address Stage 4; Items 5, 10, 18, 27, and 29 address Stage 5; and Items 2, 9, 20, 22, and 31 address Stage 6 (George et al., 2006). To review, the seven Stages of Concern, as summarized by the evaluator, are listed below:

- Stage 0 (Unconcerned): An individual has little to no concern about an innovation.

- Stage 1 (Informational): An individual is aware of the innovation, but he or she has no concern about what the innovation entails for him- or herself.
- Stage 2 (Personal): An individual is unsure of (a) what the innovation demands; (b) his or her ability to meet those demands; and (c) his or her role with the innovation.
- Stage 3 (Management): An individual is focused on issues of efficiency and scheduling.
- Stage 4 (Consequence): An individual considers how the innovation would impact others.
- Stage 5 (Collaboration): An individual focuses on coordinating and collaborating with others on the use of the innovation.
- Stage 6 (Refocusing): An individual seeks to gain additional benefits from the innovation and may be considering making changes or replacing the innovation to gain better results (George et al., 2006).

The questionnaire also includes four additional questions to examine how long teachers have been involved with the innovation, what they consider their proficiency level to be when it comes to use of the innovation, whether or not they have received formal training regarding the innovation, and whether or not they are involved with any other major innovations at the same time (George et al., 2006). Finally, respondents complete items to gather demographic information.

Scoring the Online Survey

In order to score the online surveys, the evaluator followed the steps for scoring that were outlined in the SoCQ manual. For each survey, the responses for each stage were separated into separate columns and then totaled to find a raw score. In other words, the responses of a participant for Questionnaire Items 3, 12, 21, 23, and 30 were all placed in one column representing Stage 0 and then these responses were all added together to calculate a raw score for Stage 0 for that participant. Continuing in this manner, raw scores were calculated for each Stage of Concern for each participant (see Appendix L). The lowest raw score for each stage was 0 (if a respondent entered all zeros for the five items corresponding to a particular stage) and the highest score for each stage was 35 (if a respondent entered all sevens for the five items corresponding to a particular stage). Next, the raw scores for each stage for each participant were converted to percentile scores using a conversion table included in the SoCQ manual (see Appendix M). To look at the results of the entire group of teachers rather than just individual teachers, the evaluator averaged the raw scores of each respondent for each stage and then converted that number to its corresponding percentile score (shown at the bottom of the table in Appendix L). These numbers were then used to create a group profile, which could be visually displayed in the form of a bar graph for further analysis.

Interview Protocol

As a follow-up to the survey (and due to time constraints), the structured teacher interviews (see Appendix I) were conducted over the phone at the same time that the final surveys were being collected. Each interview did not exceed 30 minutes from start to finish. The interview questions were intended to probe deeper into the scope of current LMS usage,

teachers' needs when it comes to use of a LMS, and obstacles (if any) interfering with LMS use. During the survey, teachers were asked if they would participate in a follow-up interview. After the evaluator reached out to the interested teachers to make arrangements for the interviews, a total of three teachers responded during the data collection window. A fourth teacher responded after the data collection window had closed. As a result, three teacher interviews were conducted. All three teachers were selected because they taught differing grades and subjects.

Data Collection

The survey data from School A was collected in March and April of the 2016-2017 school year. The following steps specifically describe the survey data collection process: First, the evaluator placed the survey online using Qualtrics. Second, recruitment of the study participants (School A teachers) was conducted via a teacher-only website and message delivered to the teachers' non-work e-mail addresses. The evaluator drafted the invitation e-mail (see Appendix D), which was submitted for approval by the Institutional Review Board (IRB). Third, after each participant indicated that he or she was a School A teacher and signed the consent form electronically (see Appendix E), the survey opened. Fourth, survey results were collected and stored via Qualtrics. Fifth, follow-up reminders for the survey were sent by the evaluator. Sixth, the survey was closed and the results were downloaded and exported. Seventh, the evaluator then reviewed the survey results for the main topics of discussion found in the evaluation questions. The main topics were: Stages of Concern Profile, teacher concerns, benefits of the LMS, barriers to the LMS, and teacher needs. The evaluator also verified the

sample size. Eighth, the evaluator ensured the participants' confidentiality. Finally, data was analyzed according to the SoCQ manual.

The interview data from School A was collected in April of the 2016-2017 school year. The following steps specifically describe the interview data collection process: First, recruitment of the interview participants (School A teachers) was conducted through the online survey. The evaluator drafted the invitation e-mail (see Appendix D), which was submitted for approval by the IRB. Second, after each participant indicated that he or she was a School A teacher and acknowledged the consent form (see Appendix H), the interview began. Third, interview results were collected and stored on a secure server. Fourth, after three interviews were conducted, the interviewing phase was concluded. Fifth, the evaluator then transcribed the interviews and examined the data for the main topics of discussion found in the evaluation questions. The main topics were: teacher concerns, benefits of the LMS, barriers to the LMS, and teacher needs. Finally, the evaluator ensured the participants' confidentiality.

Survey

The aforementioned online survey was used to collect quantitative data anonymously from teachers. The link to the online survey was shared with all currently employed teachers. To minimize possible nonresponse error, the evaluator used a simplified version of Dillman's (1999) five-contact method in survey distribution. Dillman's method helps researchers build trust with the possible participants. By securing a higher response rate, this helped procure stronger data (Sivo, Saunders, Chang, & Jiang, 2006). Survey data was stored securely and all participants were kept anonymous both in raw data form as well as the survey analysis and data write-up. All data was collected on a secure, password-protected computer belonging to the evaluator only.

Interviews

Three teachers from School A were interviewed. The interview questions served as an extension to the survey questions to get a deeper look at the teachers' perceptions of the recently adopted LMS at School A. The interview allowed teachers to elaborate on their current uses of the LMS in the classroom. All names of interview participants were kept confidential and they were not used in the write-up. Each interview took place over the phone. Interview audio was recorded (with participant permission) so that it could be transcribed by the evaluator afterward. (This allowed for analysis of the data.) The interviewees had the opportunity to review their transcripts and make changes, if necessary. If there was anything that needed to be clarified by the interviewee, the interviewer (the evaluator) followed up with him or her.

Data Analysis

The formative process evaluation design used applied mixed-methods of analysis, which yielded both qualitative and quantitative data by way of the following data sources: surveys and interviews. The surveys were distributed first and then the interviews were conducted. The follow-up interviews helped further explore the results provided by the initial survey. More specifically, the electronic survey was intended to capture teacher concerns regarding use of a LMS mainly through questions using a Likert scale. The interviews were then intended to zone in on teachers' perceptions of the LMS, their current experience with the LMS, the scope of their current LMS use in the classroom (including the frequency of use), their satisfaction with the LMS, and features they wish they knew how to use within the LMS (if any). Descriptive

statistics were used to help answer the evaluation questions, to provide a summary of the study sample, and to look for any emerging patterns.

Summary

This process evaluation was intended to be formative in nature so that it would provide information on how well the LMS was working as a teaching tool as well as the degree to which the LMS was being used by teachers. This information is crucial because it can help identify any issues or problems that have occurred and also whether or not there have been adequate resources or support to overcome those issues or problems. With that information, future activities of the LMS can be improved to ultimately help secondary teachers use a LMS more effectively. The setting of the study was a public high school in Florida that serves approximately 2,200 students from grades 9-12. Information sources including teacher surveys distributed online and teacher interviews conducted over the phone were the data points used in this study to explore the evaluation questions. The results and analysis of both the surveys and interviews are reported in Chapter Four.

CHAPTER FOUR: FINDINGS

Introduction

The purpose of this study is to examine secondary teachers' perceptions, concerns, and integration of a LMS at a public high school located in Florida. Much of the success of this innovative technology rests on its implementation by teachers; therefore, it is important to understand teachers' insights and experiences with the technology. This is especially important as completion of at least one online course is a graduation requirement for Floridian students. The teachers' use of the LMS to supplement their face-to-face courses can positively or negatively affect students' experiences with use of a LMS to learn. As a result, teachers should act in their capacity to help adequately prepare students for successful online learning.

This chapter contains the quantitative and qualitative data collected through teacher surveys and interviews during the spring semester at School A. The results are organized into five sections or topics of discussion, which correspond to the evaluation questions shown in the data collection blueprint (see Appendix J). The sections are as follows: Stages of Concern Profile (a section intended to specifically address the results from the SoCQ), teacher concerns, benefits of the LMS, barriers to the LMS, and teacher needs.

The design for this study was a formative process evaluation. The evaluator sought to explore the perceptions of secondary teachers enhancing their face-to-face courses with a LMS and to examine how the implementation of the LMS could be improved. Furthermore, this study examined ways in which teachers currently experience successes with the LMS as well as internal and external factors that impact the teachers' use of the LMS. These findings were used

to provide additional insight into the level of concern demonstrated by teachers according to the Concerns-Based Adoption Model (George et al., 2006).

The Participants

The population for this study was 125 secondary teachers employed at School A in the 2016-2017 school year. The survey sample consisted of 36 teachers that completed the survey instrument and the interview sample consisted of three teachers. The participants are further described in the sections below.

Survey

At School A, there were 125 teachers invited to take the SoCQ. A total of 40 survey responses were recorded; however, four of the respondents agreed to the survey consent, but they did not complete any remaining items. Consequently, only a total of 36 surveys could be used, which yielded a response rate of 28.8%. Of the 36 survey respondents, 12 teachers were male and 24 teachers were female. The percentage of male and female teachers in the study population was comparable to School A's teacher population. In a roster reported by School A for the 2016-2017 school year, 41% of School A teachers were male and 59% of School A teachers were female.

The most reported age groups for the teachers in the survey sample were 26-30 (19%), 31-35 (19%), and 41-45 (19%) (see Table 2). No teachers reported an age range of 21 or under nor 61 and above.

Table 2

Demographics of Survey Participants: Age

Demographic Question	Possible Responses	Number of Participants
What is your age?	21 or under	0
	22-25	2
	26-30	7
	31-35	7
	36-40	3
	41-45	7
	46-50	2
	51-55	4
	56-60	3
	61+	0
Total		35

Note. One survey respondent did not answer the demographic question pertaining to age; however, he or she filled out all of the remaining survey items. Therefore, only 35 responses were recorded for the question regarding age.

The study sample featured a high percentage (83%) of respondents reporting their race/ethnicity as Caucasian (see Table 3). Other ethnicities included Hispanic or Latino (reported by two respondents), Black or African American (reported by two respondents), and Asian/Pacific Islander (reported by one respondent). One remaining respondent selected the category of ‘Other’ as his/her race/ethnicity. No respondents selected the category of ‘Native American or American Indian.’

Table 3

Demographics of Survey Participants: Race/Ethnicity

Demographic Question	Possible Responses	Number of Participants
What is your race/ethnicity?	Caucasian	30
	Hispanic or Latino	2
	Black or African American	2
	Native American or American Indian	0
	Asian/Pacific Islander	1
	Other	1
Total		36

Table 4 outlines the highest degree of completion for those in the study sample. It shows that the teachers in the sample were similar in their education levels. The majority of the respondents reported having a Master's degree (50%); 44% of respondents reported having a Bachelor's degree; 3% reported having a High School/GED; and the remaining 3% reported having a Ph.D. or Ed.D. No respondents reported having a Specialist degree.

Table 4

Demographics of Survey Participants: Education

Demographic Question	Possible Responses	Number of Participants
What is the highest degree that you completed?	High School/GED	1
	Bachelor's	16
	Master's	18
	Specialist	0
	Ph.D. or Ed.D.	1
Total		36

The sample had varying years of teaching experience (see Table 5). The majority (28%) of respondents reported having 11-15 years of experience followed by 19% reporting having 4-6 years. The number of teachers reporting higher numbers of years of experience was limited as only two respondents reported having 21-25 years of total teaching experience and only one respondent reported having 26-30 years of experience.

Table 5

Demographics of Survey Participants: Teaching Experience

Demographic Question	Possible Responses	Number of Participants
Select the number of years of your teaching experience.	0-3	6
	4-6	7
	7-10	4
	11-15	10
	16-20	6
	21-25	2
	26-30	1
	31+	0
Total		36

Interviews

Participants were recruited to the evaluation using purposeful or convenience sampling. The study participants in the interview process offered their personal insights including the concerns, benefits, barriers, and needs they have encountered while teaching with a LMS. To protect their identities, the three interview participants were assigned numbers. The demographic data for the interview participants is shown in Table 6.

Table 6

Demographics of Interview Participants

Participant	Gender	Highest Degree	Subjects Taught	Years Teaching
1	Female	Master's	Career and Technical Education (CTE)	4-6
2	Female	Bachelor's	English	4-6
3	Female	Master's	ESOL	11-15

Stages of Concern Profile

Survey

Evaluation Question 1 specifically addressed the topic of the Stages of Concern Profile. More specifically, it sought to determine which Stage of Concern had the highest intensity for each survey participant and which one was the highest, on average, for the group of survey participants. Evaluation Question 6 then sought to determine how the specific concerns for survey participants could be appropriately addressed using the CBAM as well as the expertise of the participants. Both evaluation questions used in this section are:

- Evaluation Question 1: According to the Concerns-Based Adoption Model, what stage(s) of concern (regarding the LMS) do teachers perceive to be the most intense?
- Evaluation Question 6: What are the most important unresolved concerns for teachers (regarding the LMS) and how might they be resolved?

To recap, the seven Stages of Concern are summarized by the evaluator in the list below:

- Stage 0 (Unconcerned): An individual has little to no concern about an innovation.

- Stage 1 (Informational): An individual is aware of the innovation, but he or she has no concern about what the innovation entails for him- or herself.
- Stage 2 (Personal): An individual is unsure of (a) what the innovation demands; (b) his or her ability to meet those demands; and (c) his or her role with the innovation.
- Stage 3 (Management): An individual is focused on issues of efficiency and scheduling.
- Stage 4 (Consequence): An individual considers how the innovation would impact others.
- Stage 5 (Collaboration): An individual focuses on coordinating and collaborating with others on the use of the innovation.
- Stage 6 (Refocusing): An individual seeks to gain additional benefits from the innovation and may be considering making changes or replacing the innovation to gain better results (George et al., 2006).

Table 7 describes the data sources that were used to evaluate the questions related to the Stages of Concern Profile. The quantitative survey data was used to ascertain teachers' most intense concerns so that those concerns could be resolved. Resolution of the lower Stages of Concern would allow individuals to advance to the higher Stages of Concern. By advancing to the higher stages, the LMS will be used effectively by teachers so that it achieves its desired outcomes.

Table 7

Data Collection Blueprint for Stages of Concern Profile

Evaluation Questions	Data Type	Instrument	Sample
1. According to the CBAM, what stage(s) of concern (regarding the LMS) do teachers perceive to be the most intense?	Quantitative	Online Survey Questions: 1-35	Teachers
6. What are the most important unresolved concerns for teachers (regarding the LMS) and how might they be resolved?			

Note. Since Evaluation Question 6 builds on Evaluation Question 1, these two questions are intended to be examined together.

In the study population, Stage 0 (Unconcerned) appeared as the stage of highest concern for 29 teachers (81%). See results in Appendix M. Based on the instrument, an individual in the Unconcerned stage is aware that the innovation exists, but has limited knowledge of it, little involvement with it, and overall is not concerned about it (Lochner et al., 2015). George et al. (2006) explain that Stage 0 indicates how much of a priority an individual is placing on an innovation. More specifically, they state that Stage 0 refers to “the degree of interest in and engagement with the innovation in comparison to other tasks, activities, and efforts of the respondent” (p. 33). As such, if the respondent has a low score for Stage 0, this means that he/she regards the innovation as a high priority (George et al., 2006). On the other hand, if the respondent has a high score for Stage 0, this means that the respondent places other projects, jobs, or even endeavors as a higher priority than the innovation in question (George et al., 2006). In contrast, Stage 6 (Refocusing) appeared as the highest Stage of Concern for only one individual in the study. Even more remarkably, Stage 4 (Consequence) never appeared as a stage of highest concern for any of the individuals in the study. It should be noted that Appendix M

shows the percentile scores for each Stage of Concern for all 36 teachers at School A. After finding the raw scale scores for each participant, the raw scores were converted to percentile scores using a conversion table provided in the instrument's manual. In the table featured in Appendix M, the gray boxes indicate the stage with the highest intensity of concern for each individual. If more than one box is grayed for the same individual, it signifies that either two or more stages had the same percentile or there were percentiles within one or two points of the highest score for that individual. For example, Appendix M shows that the highest Stage of Concern for survey respondent 1 was Stage 1, the Informational stage, with 91% relative intensity followed by Stage 2, the Personal stage, with 89% relative intensity. The highest Stage of Concern for survey respondent 2 was Stage 5, the Collaboration stage, with 76% relative intensity. Unlike survey respondent 1, there were no other stages that were within one or two points of the highest Stage of Concern for survey respondent 2. As a final note, George et al. (2006) explain that the percentile scores are not absolute, but rather relative to other stage scores for an individual. In other words, a 55th percentile might represent one respondent's most intense Stage of Concern; however, the same percentile may actually represent another respondent's least intense Stage of Concern (George et al., 2006).

After the percentile scores were found for each stage for each individual, these values could be used to generate an individual profile of concern in the form of a bar graph using the seven stages as the x-axis and the percentile scores, or relative intensity of concern, as the y-axis. The evaluator was able to create a group profile of concerns for all 36 survey respondents at School A by averaging the raw scores of each respondent for each stage and then converting that number to its corresponding percentile score (see Appendix L). Figure 2 displays the group profile below:

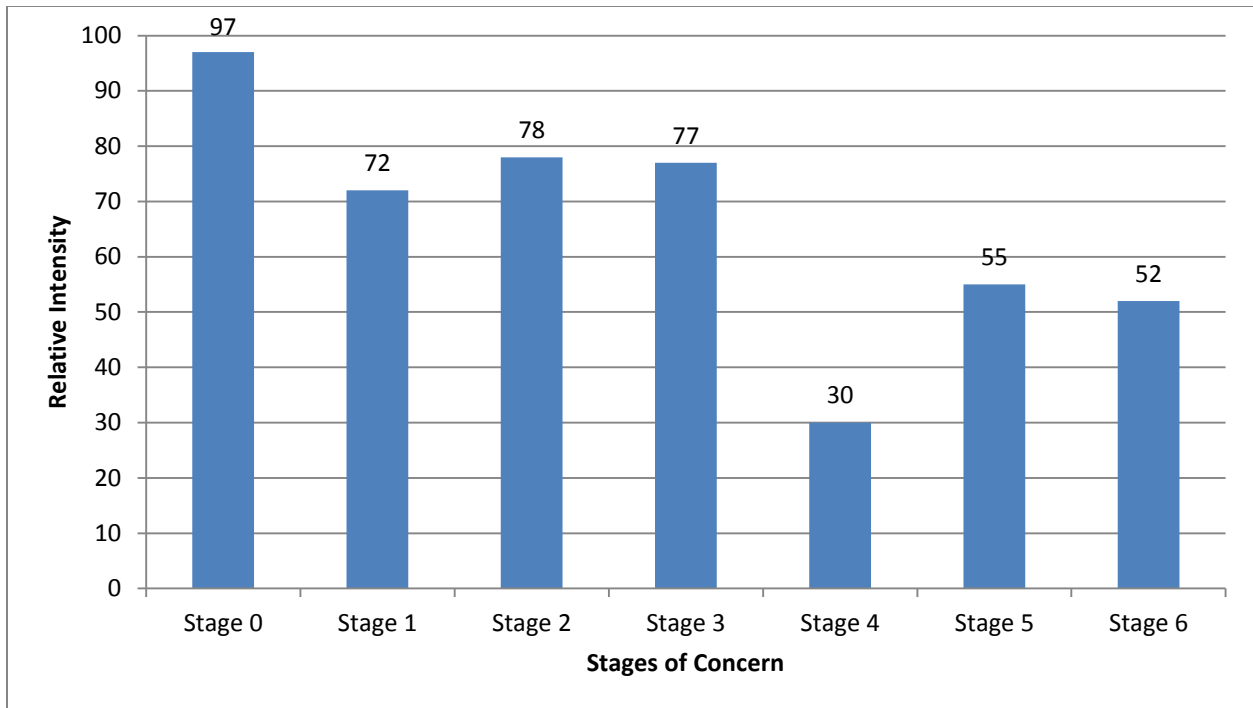


Figure 2. The group profile for School A survey respondents.

The group profile above shows the following as the most intense concerns: Stage 0 or Unconcerned (with 97% relative intensity), followed by Stage 2 or Personal (78%), Stage 3 or Management (77%), and Stage 1 or Information (72%). As noted earlier, a high relative intensity score for Stage 0 reveals the group has little concern about or involvement with the LMS. The next highest Stage of Concern for the group was Stage 2, which had a relative intensity of 78%. Stage 2 is the Personal stage. Khoboli & O’Toole (2012) explain that an individual enters this stage when he or she expresses concerns over how the innovation impacts him/her and when the individual expresses concerns over his or her personal skills. Therefore, a high Stage 2 reveals that there was a statistically significant difference noted in the Personal concerns stage. It must be mentioned that while the survey results may reveal that the respondents have a feeling of uneasiness toward the LMS, this does not automatically indicate a resistance toward it (George et

al., 2006). The third highest Stage of Concern for the group was Stage 3, which had a relative intensity of 77%. Stage 3 was described as the Management stage. In this stage, an individual is concerned about the efficiency and implementation of an innovation (Lochner et al., 2015). A high Stage 3 score would then indicate that, on average, the survey respondents are concerned with how their time is affected by their use of the LMS as well as the logistics (including resources) associated with LMS implementation. Finally, the fourth highest Stage of Concern for the group was Stage 1, which had a relative intensity of 72%. Stage 1 is the Information stage in which an individual becomes familiar with the innovation and evaluates its effectiveness and usefulness (Khaboli & O’Toole, 2012). A high Stage 1 score indicated that the survey respondents are concerned with receiving more information regarding the LMS (George et al., 2006). The four most reported concerns for School A teachers—and a summary of common issues associated with those concerns—is shown in Table 8 (Hord et al., 1987).

Table 8

Typical Expressions of the Most Intense Concerns for School A Teachers

Stage	Typical Expressions
Stage 0 (Unconcerned)	Aware of the innovation; not concerned about the innovation
Stage 2 (Personal)	Curious as to how the innovation will impact them personally
Stage 3 (Management)	Preoccupied with how the innovation will be managed; apprehensive about time management with the innovation’s tasks and requirements
Stage 1 (Information)	Interested in some aspects of the innovation; desire to learn more about the innovation

The group profile, on the other hand, shows the following as the least intense concerns: Stage 4 or Consequence (with 30% relative intensity); followed by Stage 6 or Refocusing (52%); and Stage 5 or Collaboration (55%). Stage 4 (Consequence) was the lowest Stage of Concern with 30% relative intensity. As described in the Stages of Concern Profile, an individual, such as a teacher, in the Consequence stage may be interested in knowing how the innovation affects others, such as his/her students (Holloway, 2003). A low Stage 4 shows that, on average, the survey respondents have minimal concerns about the effects the LMS has on their students. Furthermore, Stage 6 (Refocusing), with 52% relative intensity, is the stage where an individual is concerned with refining an innovation with the goal of improving student learning with measurable results (Holloway, 2003). According to George et al. (2006), if Stage 6 concerns were to tail up at the end of the curve (when the profile is displayed as a line graph), then it can suggest that an individual or group displays resistance to the innovation. Fortunately, the Stage 6 tail for the profile of School A survey respondents goes down at the end of the curve. This indicates that, on average, survey respondents do not have any other alternatives that are seen as having more merit than the LMS currently used (George et al., 2006). Last but not least, Stage 5 (Collaboration) had a relative intensity rating of 55%. An individual is in the Collaboration stage when he or she considers working with colleagues to stimulate effective change with the innovation (Holloway, 2003). Since this score was low, on average, this implies that survey respondents are not presently concerned with working with others when it comes to the LMS.

In the second portion of the survey, respondents were asked four multiple-choice questions, one of which they must select their proficiency level when it comes to their use of the innovation. For the LMS, most survey respondents identified themselves as novice (16 teachers), followed by intermediate (14 teachers), expert (5 teachers), and then non-user (1 teacher). No

survey respondents identified themselves as the fifth option, a past user of the LMS. Thirty-two respondents answered, “Yes” to the survey item asking whether or not they have received formal training regarding the LMS (e.g., workshops, courses) and four survey respondents answered, “No.” This suggests that while most survey respondents have received some form of formal training, more training may be needed to increase their proficiency level so that the majority of respondents could move from novices to experts.

Teacher Concerns

Evaluation Question 2 specifically addressed the topic of teacher concerns when it comes to using the LMS. The evaluation question used to assess teacher concerns is:

- Evaluation Question 2: What are teachers’ reactions to and perceptions of the implementation of the LMS?

Table 9 describes the data sources that were used to evaluate the question related to teacher concerns. This section encompasses any anxieties, worries, fears or unease experienced by teachers when it comes to LMS integration in their courses. Teachers’ reactions to and perceptions of the LMS were evaluated using quantitative survey data and qualitative interview data.

Table 9

Data Collection Blueprint for Teacher Concerns

Evaluation Question	Data Type	Instrument	Sample
2. What are teachers' reactions to and perceptions of the implementation of the LMS?	Quantitative	Online Survey Questions: 1, 2, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 26, 33, 35, 37, 38	Teachers
	Qualitative	Phone Interview Questions: 2, 4, 5, 8, 9, 11, 12, 14, 19, 22, 23, 25	Teachers

Survey

Survey participants were given the statement, “I would like to know what the use of the innovation will require in the immediate future” (Questionnaire Item 26). Using a Likert scale of 0-7, survey participants had to rate this item with 0 being irrelevant and 7 being very true of me now. A 0-7 scale was used as it mirrored the scale in the original SoCQ. The SoCQ manual cautioned against altering the instrument in any way. For this statement, almost half of the survey participants (47%) rated it as a 6 or 7, which is “Very true of me now.” Approximately 41% of the participants rated it as a 3, 4, or 5, which is “Somewhat true of me now.” Only 6% of the participants rated it as a 1 or 2, which is “Not true of me now.” Again, only 6% of the participants rated it as a 0, which is “Irrelevant.” Table 10 displays a complete summary of the survey responses for this item. (Note: Appendix N shows the percentages of responses to all of the questionnaire items arranged by corresponding stages.)

Table 10

Summary of Responses to Questionnaire Item #26 Regarding Teacher Concerns

Survey Item	“I would like to know what the use of the innovation will require in the immediate future.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
26	0	1	2	3	4	5	6	7
	<i>n</i> =2	<i>n</i> =2		<i>n</i> =15			<i>n</i> =17	

Interviews

Interview participants were asked to state, from their perspective, how satisfied they were with using the LMS as a teaching tool and why (Interview Question 25). The purpose of this question was to address overall satisfaction, not only with the LMS but also with teaching using the LMS. The following responses from all three interview participants expressed some reactions regarding their LMS experience:

- Interview Participant 1: “I would say I’m satisfied—I mean it does what I’m using it for. It does its job that way, and I know that I could use it more to do more things with it, so I’m satisfied.”
- Interview Participant 2: “I’m pretty satisfied for what I know about it and I know that, from my understanding, it does a lot of this cool stuff. I just don’t know what it does. But from what I know about it and what I’m able to do as a very beginning user, I mean I created my own rubric and I did that in one sitting without too much trouble, so I’m pretty satisfied.”
- Interview Participant 3: “I don’t know if I can answer that I’m satisfied, but I’m excited about the possibilities that it brings to my classroom.”

These responses indicate an overall positive inclination toward the LMS as Interview Participants 1 and 2 both noted that they were currently satisfied with the LMS and Interview Participant 3 indicated a feeling of excitement or enthusiasm for her future use of the LMS. These responses also demonstrate that interview participants have a self-awareness that they have more to learn about the LMS's capabilities. For instance, Interview Participant 2 admitted that she was not aware of all that the LMS can do and even described herself as a "beginner" user.

Interview participants were also asked to state if they used a LMS before now (Interview Question 23). The purpose of this question was to explore if participants had been past users of the LMS and in what context(s). All three interview participants described their past LMS experience as evidenced by the following quotes:

- Interview Participant 1: "Blackboard and Canvas as a teacher. But that's pretty much it. The fact that I used Canvas in my master's courses shows that higher level education is using it as well. So a LMS must be good somehow. You know what I mean, if they're [higher education] using a LMS and it reaches their standards, then I'm glad that we're using one as well."
- Interview Participant 2: "Years ago, as a student, when I was getting my alternative certification, they used Moodle. Well I really have to think back because that was a while ago—that was almost 10 years ago."
- Interview Participant 3: "Yes—both [Blackboard and Moodle]. Well I've used them both as a student. I've never used them as a teacher. There was a computer science course in Moodle that I was taking for education. Blackboard is the one I used all through my degrees."

These responses reveal that all three interview participants have used a LMS in the past in the role of a student. Only Interview Participant 1 had the additional experience of using a LMS as a teacher prior to now. Interview Participant 1 also mentioned a satisfaction with teaching with a LMS at the K-12 level since the LMS is prevalent at institutions of higher education.

Benefits of the LMS

Evaluation Question 3 explored the topic of benefits to teaching and learning with a LMS. The evaluation question addressed in this section is:

- Evaluation Question 3: According to teachers, in what ways is the LMS successfully implemented by teachers?

Table 11 describes the data sources that were used to evaluate the question related to teaching and learning benefits of the LMS. Teachers’ reactions to and perceptions of the LMS were evaluated using quantitative survey data and qualitative interview data.

Table 11

Data Collection Blueprint for Benefits of the LMS

Evaluation Question	Data Type	Instrument	Sample
3. According to teachers, in what ways is the LMS successfully implemented by teachers?	Quantitative	Online Survey Questions: 5, 10, 11, 18, 24	Teachers
	Qualitative	Phone Interview Questions: 3, 6, 8, 10, 11, 12, 13, 14, 16, 17, 22, 24	Teachers

Survey

Survey participants were given the statement, “I would like to excite my students about their part in this approach (i.e., the innovation)” (Questionnaire Item 24). Using the SoCQ’s Likert scale of 0-7, survey participants had to rate this item with 0 being irrelevant and 7 being very true of me now. For this statement, a fairly large percentage of survey participants (42%) rated it as a 6 or 7, which is “Very true of me now.” Approximately 39% of the participants rated it as a 3, 4, or 5, which is “Somewhat true of me now.” Only 11% of the participants rated it as a 1 or 2, which is “Not true of me now.” Finally, only 8% of the participants rated it as a 0, which is “Irrelevant.” Table 12 displays a complete summary of the survey responses for this item. These responses show that the majority of survey participants see the LMS as having a positive effect on their students and would like to find opportunities to get their students more involved with LMS use.

Table 12

Summary of Responses to Questionnaire Item #24 Regarding Benefits of the LMS

Survey Item 24	“I would like to excite my students about their part in this approach”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=3</i>	<i>n=4</i>		<i>n=14</i>			<i>n=15</i>	

Interviews

As a follow-up, interview participants were asked to state, from their perspective, what was their favorite teaching feature in the LMS and why (Interview Question 24). The purpose of this question was to identify components of the LMS that teachers deem beneficial and to

highlight current teacher successes with LMS implementation in the classroom. The following responses by all three interview participants provided insight into advantages provided by the LMS:

- Interview Participant 1: “I like the fact that it posts grades to [...]*. I think that it’s so convenient.”
 - **The specific name of the grade book has been removed to protect anonymity of the school*
- Interview Participant 2: “Well if this [...]* assignment of peer editing works out, I think that will be my favorite. Only because it will be so easy. Because the kids want to be on the computer and write, they want to do their projects right there, and then they could do it right there and upload it and be done, and then everything would be in one location, and then I could even expand that peer editing into my English courses when we start evaluating the PEEL paragraphs and essays and things like that so I can see having that work in my English classes as well.”
 - **The specific name of the course subject has been removed to protect confidentiality of interview participant*
 - *PEEL is a writing strategy that teaches students to include a Point, Evidence, and Elaboration in their paragraphs*
- Interview Participant 3: “I like that they [the students] can submit—I love the rubric. I need to learn how to use it better, but since English has so many assignments, they can submit it online and you have the rubric right there and you can grade it right there and then it’s really good. I also like the plagiarism checker. I like both of those features—the rubric, the plagiarism checker—and then I also like the fact that they [the students] can

do different activities and then just submit it. It's all right there. They don't need paper. It replaces paper and that's a good thing. When students are absent, it's easier. Like I want to start doing PowerPoints and tutorials instead of being up there and teaching all the time so next year I want to try to do that less. So if I do a tutorial, then I can upload it to the LMS, and then students can just see it. If someone was absent, or if someone doesn't understand, they can just replay it. I have language students, so if you can do subtitles in another language—I think you can—if that were an option, that would be really good for them.”

These responses show purported benefits of the LMS from these teachers' perspectives. The responses demonstrated that, according to teachers, the LMS not only piques student interest (as mentioned by Interview Participant 2) but also helps students by having all of the material in one location (as mentioned by Interview Participants 2 and 3). The LMS even provides convenience when it comes to grading (as mentioned by Interview Participants 1 and 3). Teachers referenced four beneficial LMS features: (a) peer editing feature, mentioned by Interview Participant 2; (b) easy integration within their subject and other technological systems, mentioned by all three interview participants; (c) online rubric and online submission of assignments (which creates a paperless system), mentioned by Interview Participants 2 and 3; and (d) built-in plagiarism checker, mentioned by Interview Participant 3. Lastly, the LMS is available to students who are absent for makeup work and it allows students to review content as much as need, which provides assistance to all students—most especially ESOL students. This benefit was mentioned by Interview Participant 3, an ESOL teacher, who shared a future goal to use the LMS to upload online tutorials and PowerPoints for her students to access whenever, wherever.

Interview participants were also asked if they were currently enrolled in any LMS courses besides the ones in which they are the instructors and, if so, which courses (Interview Question 22). The purpose of this question was to explore if teachers were utilizing the LMS as a vessel to receive information rather than to just transmit it. All three interview participants expressed varying answers as evidenced below:

- Interview Participant 1: “Yes. So I’m enrolled with [...] through the county. The county made this course so we could submit all of our documentation to remain in [...] rather than before they had you make a binder, so now we just use this course to communicate information with them. I’m also a member of, I’m an observer of the different [...] courses [...] so I can see what they’re doing with it and then also we have our own [...] PLC, which is for the teachers in the county [...].”
 - **Names/phrases have been removed to protect confidentiality of interview participant*
- Interview Participant 2: “No. Not currently.”
- Interview Participant 3: “Framework, ESOL reading and development course, ESOL secondary resources, two LMS trainings.”

These responses reveal mixed findings. For Interview Participants 1 and 3, it shows that the LMS has provided them with a means to access valuable resources in an easy manner. The resources they mentioned include communication with teachers and district members throughout the county, a professional learning community that extends beyond School A, curriculum materials, and support courses created by the county. For Interview Participant 2, it showed that she was only using the LMS to disseminate information through her own courses.

Additionally, Interview Participant 1 was asked how the LMS was helping her students (Interview Question 17). This question was asked to understand the student benefit of using the LMS from a teacher's perspective. Interview Participant 1's response is below:

- “The LMS provides clear expectations by having the rubric there. Students can look at it at any time so it's stating clear expectations. They can go and look at that at any time as well and also, if we do notes, they can go back and reference the notes and not worry about saving it or they forgot their binder in their locker. It's just all right there for them.”

This response reinforces several benefits to teaching with the LMS that were previously reported by Interview Participants 2 and 3. These benefits are that the LMS helps the teacher set clear expectations for the student through the use of a rubric, the teacher can make course materials, such as notes, available for students to review (if necessary), and the LMS is accessible to the student and teacher both in and out of the classroom. Since Participants 2 and 3 admitted in their interviews that their use with the LMS was quite limited during the time of the study, they both did not have a comment for this particular question.

Since Interview Participant 1 had the most experience using the LMS in the classroom (compared to Interview Participants 2 and 3), Interview Participant 1 was able to detail how the LMS is used with her students (Interview Question 11):

- “They [Students] log on and the assignments, I have them categorized by quarter. So they'll click on the assignment. There's usually an attached .pdf or PowerPoint with the notes that we took or anything associated with what they'll be doing. And then there's a rubric on there, so after they complete everything, they'll upload their final document back to the same assignment folder, and then I'll grade it using the same rubric. I just started using the feature where it posts directly to [...]*. This has been awesome. I don't

know if they had this last year, but I started using it second quarter and it's amazing and now I don't have to put grades in two times.”

- **The specific name of the grade book has been removed to protect anonymity of the school*

This response reveals teacher-reported benefits of the LMS, which are course organization, rubric accessibility, and ease of grading. With the LMS reporting to School A's grade book, this allows the teacher to only enter the students' grades once.

Interview Participant 1 was also able to describe ways in which the LMS has enhanced her teaching and the curriculum (Interview Question 12):

- “I would say the first thing is organization. Everything is in one spot; I don't have a million papers everywhere for different assignments. I would say organization and accessibility. Anyone can get it at any time. If I have a substitute, they [students] can log on and see; I'll post announcements with the sub plans. I can communicate with my students at all times. And now especially with this quarter [Quarter 4], kids are out so often so it's like they can log in and see what's due, when it's due, samples, etc.”

This response shows additional teacher-reported benefits of the LMS. Interview Participant 1 noted course organization once again (as noted in Interview Question 11), course accessibility for students, and teacher-to-student communication.

Barriers to the LMS

Evaluation Question 4 concentrated on the topic of barriers or obstacles, if any, faced by teachers that may hinder their use of the LMS. The evaluation question used in this section is:

- Evaluation Question 4: According to teachers, what are internal and external factors, if any, impacting the use of the LMS?

Table 13 describes the data sources that were used to evaluate the question related to barriers.

Teachers’ reactions to and perceptions of the LMS were evaluated using quantitative survey data and qualitative interview data in an effort to determine how the implementation of the LMS can be improved.

Table 13

Data Collection Blueprint for Barriers to the LMS

Evaluation Question	Data Type	Instrument	Sample
4. According to teachers, what are internal and external factors, if any, impacting the use of the LMS?	Quantitative	Online Survey Questions: 2, 3, 6, 11, 13, 16, 21, 23, 28, 30, 34, 36, 39	Teachers
	Qualitative	Phone Interview Questions: 1, 3, 5, 6, 7, 8, 10, 13, 15, 17, 20, 21, 22	Teachers

Survey

Survey participants were given the statement, “I have a very limited knowledge of the innovation [the LMS]” (Questionnaire Item 6). Using the SoCQ’s Likert scale of 0-7, survey participants had to rate this item with 0 being irrelevant and 7 being very true of me now. This statement sought to determine if lack of knowledge in using the LMS served as a potential barrier to respondents. Of the survey participants, approximately 42% rated this item as “Not true of me now.” This shows that almost half of those who took the survey do not feel their knowledge of the LMS is limited. Approximately 39% of the participants rated it as “Somewhat

true of me now.” A small percentage of the participants (8%) rated it as “Very true of me now.” The remaining 11% of the participants rated it as “Irrelevant.” Table 14 displays a complete summary of the survey responses for item 6.

Table 14

Summary of Responses to Questionnaire Item #6 Regarding Barriers to the LMS

Survey Item 6	“I have a very limited knowledge of the innovation [the LMS]”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=4</i>	<i>n=15</i>		<i>n=14</i>			<i>n=3</i>	

Next, survey participants were given the statement, “I am concerned about my inability to manage all that the innovation requires” (Questionnaire Item 16). For this statement, one-third of survey participants (33%) rated it as “Very true of me now.” Approximately 39% of the participants rated it as “Somewhat true of me now.” The remaining 28% of participants rated the item as either “Not true of me now” or “Irrelevant.” This indicates that teachers view their ability to successfully manage the new innovation as a potential barrier. This also highlights an issue of teachers having enough time to devote to the LMS and their other teaching tasks. Table 15 displays a complete summary of the survey responses for item 16.

Table 15

Summary of Responses to Questionnaire Item #16 Regarding Barriers to the LMS

Survey Item 16	“I am concerned about my inability to manage all that the innovation requires”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=3</i>	<i>n=7</i>		<i>n=14</i>			<i>n=12</i>	

Interviews

In the follow-up interviews, participants were asked how they would rate the LMS’s ease of use on a scale of 1-5 (with 1 being the easiest and 5 being the most difficult) and to give their rationale (Interview Question 3). A 5-point scale was selected by the evaluator to provide quality data on this opinion-based question and to provide ease to participants responding to this question. The purpose of this question was to identify any factors that may hinder teacher use of the LMS. The following responses by all three interview participants provided insight into possible barriers experienced by teachers:

- Interview Participant 1: “I would give it a 2. There are some things that aren’t user-friendly. For example, we have a textbook for one of my classes and it has a test bank with questions. For the life of me, I cannot figure out an easy way to import the test questions. And they have the same format that the LMS asks for, and I consider myself tech-savvy, but I cannot figure out the right format so that I don’t have to go back and edit the questions myself to make them look normal. So that’s the only reason. I just haven’t messed with importing other stuff because I knew that was a headache, so I haven’t taken the time to try other things.”

- Interview Participant 2: “I would say probably a 4. I’m not real tech-savvy, but given the right screen, I can find my way around and eventually figure out how to work something and yea, this LMS isn’t like that.”
- Interview Participant 3: “4. I don’t think it’s hard to use. I think it’s not user-friendly. Once I went to the training, then I got really excited and thought, this isn’t so bad but just going on there and seeing the blank LMS and trying to build on that, that’s a little intimidating and I don’t think it’s user-friendly. I think it could be friendlier. I think maybe between a 3 and a 4, but I would say my first impression is at least a 4.”

These responses show that both Interview Participants 2 and 3 rated the LMS’s ease of use as a 4, meaning they believe it be on the difficult end whereas Interview Participant 1 viewed it as easier to use, but did admit that there are some components to the LMS that are not user-friendly, which is what Interview Participant 3 admitted as well. Specific items the teachers listed as not user-friendly are importing test questions using a test bank provided by a textbook and building on the basic course shell. Interview Participants 1 and 2 both admitted that they consider themselves to be “tech-savvy” in their responses.

Early in the interview, participants were asked what types of content they typically post on the LMS (Interview Question 5). The purpose of this question was to explore the depth of LMS use by teachers. Interview participants could have reported items such as, announcements, modules, audio, video, discussion boards, assignments, URLs, course notes, etc. Responses from all three interview participants varied greatly:

- Interview Participant 1: “I’ve done discussion boards. I haven’t done any audio/visual things. I’ve tried modules a little bit. But I mostly just post assignments and have students

upload their finished product on there. I use the rubric and then grade through there as well.”

- Interview Participant 2: “Everything—I just upload in a module because I don’t know how to do that other stuff. And there’s a calendar on there and that is my announcements, which I need to update but I don’t, and everything else is a module. There are the notes on this topic for my [...] classes or for my English classes. The notes would be a PowerPoint and sometimes if I have it, I’ll put up a worksheet—those are Word documents. There might be .pdfs, but it’s mostly Word documents.”

- **The name of the course subject has been removed to protect confidentiality of interview participant*

- Interview Participant 3: “I’ve used NoRedInk, Journeys© (for reading), Achieve3000® (for reading) because I teach both courses (Reading and Language Arts), Google Docs, Google Slides, PowerPoint and Prezi to present in class, but I haven’t done the usual YouTube courses. I introduced students to Khan Academy, but they haven’t used it for my class, they’ve just used it to review for math class. So I think we try to touch on most of the technology that we’re required to use, but the LMS is the one that’s been like ‘ahhh.’ ”

Firstly, it must be noted that Interview Participant 3 was describing the types of online tools currently used with students since it was disclosed early in the interview that her LMS use in the classroom was limited at the time of the study. Interview Participant 3 stated, “I am a new teacher so I began in August. I decided to not use the LMS because it’s been very overwhelming.” All of the above interview responses show lack of knowledge in using the LMS, which may be hindering teachers from using all of the features in the LMS (as mentioned by

Interview Participants 1 and 2)—or any features at all (as mentioned by Interview Participant 3). It appears that Interview Participants 1 and 2 aimed to meet the minimum LMS requirements, and Interview Participant 3 expressed meeting an objective to use required technology (other than the LMS).

In the first interview question, participants were asked how often they access their own LMS course (e.g., daily, weekly, monthly, etc.) This question was included to discover the frequency of use of the LMS. The responses ranged from daily access to no access at all:

- Interview Participant 1: “Daily. [...] * I am on it like, I don’t know, I keep it open on my computer all day every day.”
 - **Phrase removed to protect confidentiality of interview participant*
- Interview Participant 2: “Not very often until recently. It was almost never. Yea, I would update it (for instance the calendar) whenever they [administration/PLC leaders] made me. I would upload PowerPoints or worksheets and things like that for when kids weren’t in class so they could have access to it, but other than that that’s all I used it for before.”
- Interview Participant 3: “Never. No updating so far.”

By asking about how often interview participants access their own LMS course, it is apparent that use among teachers varies widely. Interview Participant 1 integrated the LMS daily in the courses taught. (With that said, it must be noted that some secondary courses may lend better to an online component than others. For example, a technology course that is taught in a computer lab may utilize a LMS more so than a different course at the same school.) Interview Participant 2 appeared to be increasing her LMS use at the time of the study. In a later question, Interview Participant 2 mentioned having “less than 2 hours of formal training on the LMS,” (in response to Interview Question 19) but that she had been “using it more lately” (in response to Interview

Question 2) after a recent training session. Before answering Interview Question 1, Interview Participant 3 shared the following concession:

- “I am a new teacher, so I began in August. I decided to not use the LMS because it’s been very overwhelming—because I feel that there is not enough support. When I sat down to do the LMS—I am pretty tech savvy and I love technology—and I thought, when I started doing it, ‘this is really time-consuming,’ so unless I get somebody to train me to do this quickly, it’s going to take too much time, and it was taking up so much time trying to get the curriculum. So I’ve postponed the use of it. So what I’ve done is throughout the year, like mostly this semester, is I’ve been to three LMS trainings on different things, and I’m very excited about the possibility of using it next year. I just think that teachers just need to be given more information on how to use these things because they’re great tools.”

After sharing this revelation, the interview continued. In Interview Question 6, interview participants were asked how long they have been using the current LMS. This question was included to provide insight into teachers’ computer self-efficacy (a determinant of PEU) when it comes to teaching with a LMS (Venkatesh & Davis, 2000). It could have helped identify barriers and/or benefits. According to their responses, Interview Participant 1 was the only participant with prior experience teaching with a LMS:

- Interview Participant 1: “I was first introduced to the LMS two years ago, no three years ago, the year before School A got it. I can’t remember. It’s all blending together. So I used it first and then that following school year is when School A must have made the switch, so three years.”

- Interview Participant 2: “Just started using the LMS this school year. No prior experience with this LMS...I just remembered, I took an ESOL class and that was through the LMS. I just remembered. But that was last semester.”
- Interview Participant 3: “I started teaching in [...]*, but in Florida, I started teaching in August, so it’s my first year teaching in a Florida county. So in [...]* we didn’t have anything like this.”
 - **Names removed to protect confidentiality of interview participant*

As evidenced in the quotes above, Interview Participants 2 and 3 had no prior exposure or experience with the current LMS before the school year studied in the evaluation.

Teacher Needs

Evaluation Question 5 focused on the topic of teacher needs, if any, when it comes to teaching with the LMS. The evaluation question used in this section is:

- Evaluation Question 5: According to teachers, what are the ways the implementation of the LMS could be improved?

Table 16 describes the data sources that were used to evaluate the question related to teacher needs. Teachers’ reactions to and perceptions of the LMS were evaluated using quantitative survey data and qualitative interview data in an effort to determine how the overall implementation of the LMS can be improved. In order to fully address this evaluation question, the evaluator parsed information from responses to the questions listed in the blueprint below:

Table 16

Data Collection Blueprint for Teacher Needs

Evaluation Question	Data Type	Instrument	Sample
5. According to teachers, what are the ways the implementation of the LMS could be improved?	Quantitative	Online Survey Questions: 4, 15, 19, 20, 22, 27, 29, 31, 32, 38	Teachers
	Qualitative	Phone Interview Questions: 7, 8, 18, 19, 20, 21	Teachers

Survey

To begin, survey participants were given the statement, “I would like to coordinate my efforts with others to maximize the innovation’s effects” (Questionnaire Item 27). Using the SoCQ’s Likert scale of 0-7, survey participants had to rate this item with 0 being irrelevant and 7 being very true of me now. For this particular statement, a little more than half of the survey participants (53%) rated it as a 6 or 7. This signals that teachers have a need for collaboration with their colleagues. A little more than one-third of the participants rated this item as “Somewhat true of me now” (36%). A small percentage of participants (8%) rated it as “Not true of me now.” Only 3% of participants rated it as “Irrelevant.” Table 17 displays a complete summary of the survey responses for this item.

Table 17

Summary of Responses to Questionnaire Item #27 Regarding Teacher Needs

Survey Item 27	“I would like to coordinate my efforts with others to maximize the innovation’s effects”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=3</i>		<i>n=13</i>			<i>n=19</i>	

Furthermore, survey participants were given the statement, “I would like to know what other faculty are doing in this area” (Questionnaire Item 29). For this statement, more than half of survey participants (58%) rated it as a 6 or 7. This shows a desire for teachers to stop using the LMS in isolation and to collaborate with each other and to share ideas and resources when it comes to the LMS. A little more than one-third of participants (36%) rated this item as “Somewhat true of me now.” Only 6% of participants rated it as “Not true of me now,” and no participants rated it as “Irrelevant.” Table 18 displays a complete summary of the survey responses for this item.

Table 18

Summary of Responses to Questionnaire Item #29 Regarding Teacher Needs

Survey Item 29	“I would like to know what other faculty are doing in this area”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=0</i>	<i>n=2</i>		<i>n=13</i>			<i>n=21</i>	

Interviews

In Interview Question 7, participants were asked how they would rate their proficiency level when it comes to using the LMS (for example, beginning, intermediate, or advanced) and to give their rationale. The purpose of this question was to identify teachers’ self-reported degree of expertise in using the LMS. The following responses were recorded by all three interview participants:

- Interview Participant 1: “I would say somewhere in between intermediate and advanced. The issue with importing the test bank questions is the biggest thing keeping me from considering myself advanced.”
- Interview Participant 2: “If beginner is the lowest, then I’m a beginner.”
- Interview Participant 3: “Beginner. Because there hasn’t been much support.”

As evidenced from the quotes above, no interview participant indicated a proficiency level of fully advanced, which is relevant because it signals a need to improve the implementation of the LMS so that teachers’ proficiency levels can be increased.

Interview Question 21 prompted participants to describe any recent issues they have experienced with the LMS including how frequently each issue arises. This question was included under the category of “technical support” and could reveal any additional teacher needs with the LMS. The responses are as follows:

- Interview Participant 1: “No. I think the only issue I have is with the Internet. Sometimes it gets slow, but I don’t think that has anything to do with the LMS. I think that’s something with the county. I don’t think it’s a LMS-related issue.”
- Interview Participant 2: “No—I have to say, it would be my lack of knowledge on how to implement what I wanted to do that has been the issue. Not the software itself.”
- Interview Participant 3: “You know what I wish it had? A way to block the Internet because there’s no point in being able to do a quiz if they [the students] are able to open a new tab and search. So if the LMS had a way to freeze Internet usage...like if you do a pop up with a quiz so that the student can’t access the features behind it so when they log on to the quiz they can’t access the Internet and they can’t cheat. If you think about it,

why would you do a quiz that's going to be graded as a quiz and have them open another tab? How do you control that? You can search the answers.”

Each interview participant revealed diverse needs in response to this question. Interview Participant 1 expressed a need for faster Internet. Interview Participant 2 alluded to a need for more training and professional development. Interview Participant 3 expressed a concern for assessment security, which shows a lack of understanding of the LMS functionality as the LMS has a secure browser, which can be used when students take assessments in the LMS. The secure browser would disable students from being able to access other applications during the quiz—among other things.

Asking interview participants to identify something they wish they could do in the LMS that is currently not a feature (Interview Question 18) aimed to provide insight into professional development needs, if any. The responses of each interview participant are below:

- Interview Participant 1: “No, I’ve never thought of that before. So far no. I haven’t gotten to that point. I know that it has more features than I’ve used, so it’s just a matter of having time to go and do that. Like I would like to have modules set up to make it more interactive and engaging, but it’s just the time.”
- Interview Participant 2: “Well since I don’t know what all the features are—I’m not that well versed—I don’t know...I don’t know enough to know what I don’t know. I don’t even know the scope of what’s possible with technology and this sort of tool. I really like the idea of the grading aspect. That I can grade things right there in the LMS and it automatically goes into [...] and I’m not doing double duty. I really like that connectedness. And maybe if there’s more of that, only having to do things one time, instead of having to do double duty, or something like that.”

- **The specific name of the grade book has been removed to protect anonymity of the school*
- Interview Participant 3: “I’ll think about it and get back to it...I wish the standards were more organized. It’s really hard to access the standards when you’re trying to plan with them, when you’re trying to incorporate them into a quiz, so one of my complaints is how hard it is because you have to follow a path to get to just one standard. So they should do a shortcut to that, and have it more accessible. [When asked to clarify...] The LMS has a way for you to create, for example, a quiz and you attach the standard that you’re testing on to the quiz so that they have a database of questions—a question bank—and if other teachers collaborate, you can see questions that are related to that standard. So I think it’s a new feature that the LMS has, but I think it’s kind of complicated to get to that. But I think it’s a really good idea because it’s evidence of how you’ve been teaching the standards and how well you can manage working with them. But it’s very hard to get to that. But it’s when you’re creating the quiz. As a teacher, when you’re creating these quizzes or assignments to tie to the standards, to me it seems complicated.”

Interview Participant 1 expressed a need for more time to explore the LMS. She has awareness that more features (than the ones being currently used) exist and has a desire to make her course “more interactive and engaging,” but lack of time to do so is an issue. Interview Participant 2 referenced a need for more knowledge of LMS features. She has a desire to learn more about features that would specifically result in working more efficiently. Interview Participant 3 commented on the assessments in the LMS again, this time on ways to tag questions with specific learning standards or to explore previously created questions tagged under certain standards. She admires the feature, but experiences difficulty executing this task.

In Interview Question 19, participants were asked about the types of training they have received in the LMS and to describe the frequency of the training(s). Additionally, they were asked more specifically about when their last training was held and how long it lasted. These questions, once again, were aimed to explore the professional development currently provided for the LMS. The interview participants' responses are below:

- Interview Participant 1: “I went to one for the Digital Learning Leaders (DLL). There’s different sessions you can sign-up for. I’ve only gone to one so far though. I just joined it [the DLL] this year. It was face-to-face at the county office. We had different stations where we learned about different features. It was after school from 5-8 pm. I didn’t go to the one during preplan week.”
- Interview Participant 2: “The guy came to the school, and he was in the Media Center, and unfortunately it was a Wednesday, so it was a really short. He was there for everybody’s planning period, which was nice, I just wish they would’ve done it on a block day. I went during my plan.”
- Interview Participant 3: “It was a month ago, at the county, after school from 5-8 pm. Two days...If there are some over the summer, I’m going on vacation, but if it doesn’t conflict with my vacation, then I’m willing to take it. Yea, I really want to learn how to do it and that’s the only way to do that. Plus I want to start building my courses, so it’s a good time to start.”

Interview Participants 2 and 3 expressed a desire for longer (Interview Participant 2) or additional (Interview Participant 3) professional development. Interview Participants 1 and 3 mentioned scheduling conflicts during the times the professional development is (Interview Participant 1) or will be (Interview Participant 3) offered.

Summary

This formative process evaluation was conducted during the spring semester of the 2016-2017 school year at School A. The study sample consisted of 36 survey participants with follow-up interviews with three of those participants. The purpose of this study is to evaluate secondary teachers' perceptions, concerns, and integration of a LMS at a K-12 public school to see if implementation of the LMS could be improved. This mixed-methods study used qualitative and quantitative data. The qualitative data was provided through participant interviews. The evaluation questions were split into two levels:

- What are the teachers' perceptions of the LMS?
- According to teachers, how can the implementation of the LMS be improved?

The qualitative responses were then categorized under four different sections: teacher concerns, benefits, barriers, and teacher needs. Participants expressed both positive and negative feedback regarding their experience with the LMS. The quantitative data was provided through the SoCQ, which is part of the CBAM. The quantitative data showed a group profile of concerns that was consistent with that of a nonuser's concerns. In other words, a nonuser would typically have concerns that are highest for Stages 0, 1, and 2 and lowest for Stages 4, 5, and 6 (George et al., 2006). The profile generated for School A's survey respondents reflected this trend. In order to allow the concerns at higher stages to develop, the teachers' concerns at the lower stages must first be resolved (George et al., 2006). Chapter Five provides a discussion of the results. It also provides recommendations for improvement as well as recommendations for future research.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

Chapter Five presents a discussion of the results of the data that was analyzed and presented in Chapter Four and provides implications of both the evaluation findings and broader issues identified. Chapter Five concludes with recommendations for future research. The purpose of this study is to explore teacher perceptions, concerns, and integration of a LMS in a K-12 public school. This formative process evaluation revealed ways the implementation of the LMS could be refined so that teachers are more supported in their LMS use in the classroom. Both quantitative and qualitative data provided insight into teachers' perceptions of the LMS to ultimately guide and inform the future implementation of the innovation so that teachers can progress to the higher Stages of Concern (e.g., Consequence, Collaboration, and Refocusing). With this type of evaluation, it is necessary to continue evaluating the implementation of the LMS and then continue refining the implementation as needed. This ongoing process can help improve the teachers' relationship with the LMS as teachers take on a more active role of providing personal feedback on the technological system. This is important because the way teachers respond to a new innovation can strongly influence whether or not the innovation accomplishes its objectives. According to Holloway (2003), researchers often find that a problem a program experiences is not due to the program itself, but rather due to how educators respond to the program (Holloway, 2003). Continuing to refine the implementation of the LMS can also help ensure that teachers are using the LMS as it is intended, which should improve the overall quality of the product (Beyer, 1995). The formative process evaluation was organized into five sections: Stages of Concern Profile, teacher concerns, benefits of the LMS, barriers to the LMS, and teacher needs.

Discussion of Stages of Concern Profile

In the first topic of discussion, a Stages of Concern profile for teachers was specifically generated based on participants' responses to the SoCQ. By averaging the individual survey scores, the evaluator was able to see the most and least intense concerns for the group of teachers surveyed at School A. The concern profile was then visually displayed in a bar graph for further examination. The evaluation questions addressed in this section are:

- Evaluation Question 1: According to the Concerns-Based Adoption Model, what stage(s) of concern (regarding the LMS) do teachers perceive to be the most intense?
- Evaluation Question 6: What are the most important unresolved concerns for teachers (regarding the LMS) and how might they be resolved?

First, to reiterate, the seven Stages of Concern are summarized by the evaluator in the list below:

- Stage 0 (Unconcerned): An individual has little to no concern about an innovation.
- Stage 1 (Informational): An individual is aware of the innovation, but he or she has no concern about what the innovation entails for him- or herself.
- Stage 2 (Personal): An individual is unsure of (a) what the innovation demands; (b) his or her ability to meet those demands; and (c) his or her role with the innovation.
- Stage 3 (Management): An individual is focused on issues of efficiency and scheduling.
- Stage 4 (Consequence): An individual considers how the innovation would impact others.

- Stage 5 (Collaboration): An individual focuses on coordinating and collaborating with others on the use of the innovation.
- Stage 6 (Refocusing): An individual seeks to gain additional benefits from the innovation and may be considering making changes or replacing the innovation to gain better results (George et al., 2006).

Overall findings among the survey participants were that most respondents had the most intense concerns at Stage 0, or the Unconcerned stage. According to Lochner et al. (2015), this means that most individuals in the study are aware of the change or innovation but have limited knowledge of it. With a majority of the survey respondents having the most intense concerns at Stage 0, this reveals that most respondents seem to be more concerned with other plans, ideas or programs and, as a result, those other items are given a higher priority on the job. With use of the LMS as a teaching tool being low in terms of priority for the majority of survey respondents, this signals a possible underutilization of the LMS at School A. With such a powerful tool at their fingertips, underutilization of the LMS prevents teachers from teaching more effectively as well as the students' ability to learn more effectively. The next highest stage of intensity was Stage 2, or the Personal stage. This demonstrates that most individuals in the study had a feeling of uneasiness with the LMS (George et al., 2006). The next highest was Stage 3, or the Management stage. This demonstrates that most individuals were concerned with efficiency, or how their time is affected by use of the LMS. They were also concerned with the logistics surrounding the LMS. Conversely, the group's least intense concerns were Stage 5 (Collaboration), Stage 6 (Refocusing), and Stage 4 (Consequence). It was also found that teachers are not resistant to LMS use.

In reviewing the entire group profile, it is evident that it reflects one of a non-user. A non-user profile is one in which stages 0, 1, and 2 are the highest and stages 4, 5, and 6 are the lowest (George et al., 2006). Overall, the group's most intense concerns are in the initial stages.

These findings indicate that the underutilization of the LMS is not due to teachers' resistance to the technology, but rather due to the teachers' lack of knowledge in how to use the technology. This is a positive discovery for the future implementation of the LMS as teachers are willing to progress to the higher Stages of Concern with proper interventions, such as professional development and training. With School A's district investing in a LMS, it would be such a detriment to the schools and the stakeholders if underutilization were to continue. With inconsistent LMS use among teachers at the same school, this sends the wrong message to the students and also to the parents who check the LMS. If not all teachers are integrating the LMS in their curriculum, this devalues the relevance of the LMS overall. Moreover, limited use of the LMS in the classroom reduces the number of opportunities for students to use technology to communicate, collaborate, and increase their technology literacy.

For this section, a number of implications and recommendations were discovered in this formative process evaluation study. Resolution of teachers' concerns at the early stages is of upmost importance so that teachers can ultimately advance to the higher stages. According to Holloway (2003), resolution can be accomplished in a number of ways and she provides specific resolutions to each of the Stages of Concern. Since Stage 0 (Unconcerned), Stage 2 (Personal), and Stage 3 (Management) were the most intense concerns for School A teachers, Holloway's resolutions for each of these stages will be provided. The following resolutions are suggested by Holloway to resolve Stage 0 concerns: (a) elicit teacher involvement in discussions about the LMS; (b) acquire teacher input when it comes to making decisions about LMS implementation;

(c) distribute information of the LMS to get stakeholders interested but not overwhelmed; and (d) create an environment in which teachers (of various proficiency levels) feel comfort asking any and all questions. For Stage 2, Holloway suggests: (a) validate teachers' personal concerns regarding the LMS and allow for appropriate expression of those concerns; (b) provide encouragement to teachers through conversation; and (c) connect teachers at higher Stages of Concern with those at lower stages to demonstrate to those at the lower stages that personal concerns will diminish with support. Finally, for Stage 3 concerns, Holloway suggests the following: (a) make steps and components required by the LMS easily discernible to teachers; (b) respond to teachers' "how-to" issues in a timely manner; and (c) show teachers show to solve logistical problems that arise. With proper support and interventions, School A teachers will eventually advance to concerns at Stages 4, 5 and 6.

Discussion of Teacher Concerns

Teacher concerns comprised the second topic of discussion. The evaluation question addressed in this section is:

- Evaluation Question 2: What are teachers' reactions to and perceptions of the implementation of the LMS?

Among the survey and interview participants, the general consensus was that teachers had a positive inclination toward the LMS and that they were excited about the possibilities the LMS had in store for their teaching (Interview Questions 23 and 25). With over 85% of the survey participants selecting "Very true" and "Somewhat true" for the statement, "I would like to know what the use of the innovation will require in the immediate future," this shows that teachers are

interested in knowing more information about the LMS and its future requirements. With the desire to know more information, it is likely that teachers have been asking questions about the LMS. Additionally, this demonstrates that teachers are seeking more direct experience (a TAM variable) with the LMS, which could increase their overall acceptance and utilization of the LMS (Venkatesh & Davis, 2000). LMS use at School A was in its second year of implementation at the time of the study, which is important to recall. These findings are consistent with the attributes of users of an innovation who have the most intense concerns at the lower stages (e.g., Stages 0-3) (George et al., 2006). Increasing teachers' opportunities for more direct experience with the LMS could positively influence their acceptance of the technology. Moreover, use of other LMSs can help increase not only teachers' computer self-efficacy but also their level of direct experience since these systems are similar in nature. With positive impacts being made to teachers' computer self-efficacy and direct experience, their PEOU and PU can be influenced positively as well.

From the study's findings, it is apparent that there is a need for not only strong communication between the district and School A but also for effective professional development. First and foremost, teachers should be given clear and accurate information about the LMS and this information should be communicated to teachers in multiple ways (e.g., in writing, verbally, in presentations, in demonstrations, etc.) (Holloway, 2003). The district could disseminate this information through the schools' administration or through teacher leaders. Second, professional development should be provided to teachers in the form of experiential learning since experiential learning encourages internalization of the learning (Gunter & Reeves, 2016). Experiential learning would be a sensible way to also increase teachers' direct experience with the LMS. As Gunter & Reeves (2016) pointed out, this form of learning is advantageous

because people learn by doing, so hands-on experiences during professional development would increase the chances that teachers bring the skills taught at the training into their actual classroom. If possible, the professional development should be taught in a variety of methods: face-to-face, online and blended. Picciano and Seaman (2007) stated that both graduate and professional development programs, including many national associations, were increasing their use of online learning. The district of School A can follow this trend. The professional development should ease teachers' concerns regarding using a LMS in the classroom by sharing not only the theory behind use of the LMS to support instruction but also how the theory translates to practice. This can be done by showing teachers the relevance and potential of the LMS through distribution of strong LMS exemplars. Finally, professional development should clearly state the expectations of LMS use by teachers in the classroom. In order to do that, the district could use the National Standards for Quality Online Teaching, which provides comprehensive guidelines for online teaching (International Association for K-12 Online Learning, 2011). All in all, professional development exhibiting the aforementioned qualities will enable teachers to reenter their classrooms knowing the purpose of the LMS, the possibilities the LMS holds for their teaching, how to start using the LMS, and what is expected of them with the technological tool.

Discussion of Benefits of the LMS

The benefits of the LMS comprised the third topic of discussion. The evaluation question addressed in this section is:

- Evaluation Question 3: According to teachers, in what ways is the LMS successfully implemented by teachers?

Responses to Questionnaire Item 24 suggest that participants acknowledge a possibility of generating excitement in their students' through their teaching with the LMS. Since student excitement in their learning is naturally of much concern to teachers and has high relevance to their job, this can positively influence teachers' PU of the LMS (according to TAM) (Venkatesh & Davis, 2000).

Although Interview Participants 2 and 3 had limited use of the LMS at the time of the study, all three participants provided insight into the benefits of the LMS. Among the interview participants, the general consensus was that the LMS provided many benefits to teachers. Participants 1 and 3 felt that the LMS was accessible both inside and outside of the classroom allowing students to review material as much as needed and to access the makeup work if they are absent from class. Interview Participant 1 perceived the LMS to have high relevance to her job since it assists her with specific tasks that are pertinent to teaching (Venkatesh & Davis, 2000). Interview Participant 2 indicated that she observed students preferred to use technology during class time. Interview Participant 3 indicated that she can access the LMS anytime, anywhere. This provides teachers with access to many different resources, such as the teaching resources the district provides through their own LMS courses. Being able to quickly access an array of resources demonstrates a positive perceived result demonstrability of the LMS since this access to resources helps improve teacher productivity, which can be considered a tangible benefit of the system (as mentioned in TAM) (Venkatesh & Davis, 2000). Interview Participants 1 and 3 also indicated that the district maintained strong consistency of its own LMS use to provide curriculum maps and other teaching resources. Interview Participant 1 noted how the

LMS allows her to keep her course organized. During the interviews, participants identified specific advantages in the features provided by the LMS: peer editing, online rubric for assignments (helping teachers set clear expectations for assignments), online submission of assignments (creating a paperless system), and online plagiarism checker. Interview Participants especially appreciated the ability of the LMS to communicate with their grade book system, allowing them to enter grades in the LMS that would automatically transfer to their grade book thus eliminating having to enter grades twice. This makes grading more convenient for teachers by saving both time and energy. It also reduces the chances of making grading errors since teachers no longer have to manually transfer grades from one system to another. This grading feature is a tangible benefit of the technological system and demonstrates a strong output quality of the system (Venkatesh & Davis, 2000). Last, but not least, participants pointed out that the LMS provided various ways for them to communicate with students (e.g., announcements, messages, discussion boards, etc.). Interview Participant 1 specifically mentioned how the communication features in the LMS allowed her to stay in touch with her students whenever a substitute teacher filled in for her. Interview Participant 2 even mentioned using the built-in calendar feature to keep her students informed.

These findings bring forth some recommendations to improve the future implementation of the LMS at School A. With 42% of survey respondents rating Questionnaire Item 24 as a 6 or 7 and Interview Participant 1's revelation of wanting to make her LMS "more interactive and engaging," these findings suggest that teachers should attend conferences on the LMS to learn ways to use the LMS in new and exciting ways and to learn about newer features as they are added to the LMS. These trainings should directly highlight the relevancy of the LMS to teaching so that teacher's PU of the LMS can be positively influenced (Venkatesh & Davis,

2000). It is also recommended for trained district members to be brought to the school to directly instruct the faculty on ways to create interactive and engaging courses. This would help not only the teachers get excited about the LMS, but also the students. The evaluator found that approximately 42% of the respondents reported “Not true of me now” to having very limited knowledge of the innovation. It may be that respondents feel their LMS proficiency level is where it should be, or they are simply not interested in attending any additional training on the LMS at this time. This notion should be used to guide the creation of future professional development for teachers, as almost half of the participants would consider attending a more advanced LMS training—if given the choice. Since teachers are at various Stages of Concern, their needs vary and that needs to be taken into account when creating professional development. Finally, at the time of the study, it seemed that teachers were mainly using the LMS for the grading conveniences it provides. Interview participants stressed how they preferred online submission and online grading of their assignments. While the LMS can provide instructors or trainers with a means to complete tasks more efficiently, this is only one aspect of the benefits provided by a LMS. Teachers should be striving to use the LMS for more of the actual benefits specific to instruction itself. For instance, one such instructional benefit to teaching with a LMS would be using modules to deliver lessons that are rich in multimedia to make concepts more engaging and interactive for students.

Discussion of Barriers to the LMS

The barriers to the LMS comprised the fourth topic of discussion. The evaluation question addressed in this section is:

- Evaluation Question 4: According to teachers, what are internal and external factors, if any, impacting the use of the LMS?

Findings from all study participants yielded key findings. Survey respondents and interview participants noted lacking certain elements. First, of the survey sample population, 47% of respondents mentioned lacking knowledge to use the LMS fully. This may signal that these teachers need more LMS training or support. On the other hand, the other 42% of teachers who did not indicate lacking knowledge to use the LMS fully may feel they are receiving adequate training, support, and professional development. Moreover, 72% of survey respondents indicated a concern about their inability to manage all that the LMS requires. The issue of teachers having enough time and effort to devote to teaching with the LMS in addition to their other teaching tasks can negatively impact teachers' PEOU (Davis, 1989).

In the follow-up interviews, it did not appear that any interview participant expressed a fear or reluctance to using technology in the classroom, but a lack of time (a potential barrier) may be inhibiting them from experimenting fully with the LMS. All three interview participants mentioned lacking awareness of all the features the LMS has to offer. Interview Participants 2 and 3 mentioned lacking sufficient formal training and professional development for LMS use. Second, of the survey respondents, 33% admitted they were concerned about their inability to manage all of the tasks the LMS requires on top of their other teaching tasks. In the follow-up interviews, Interview Participants 1 and 3 mentioned they lacked the time needed to experiment with the LMS and to use it more with their students. Overall, interview participants were using the LMS either not at all or in such a way as to only meet the minimum requirements for use.

Interestingly, all three interview participants noted that certain aspects of the LMS were not, at times, user-friendly. This characteristic was specifically mentioned when participants

described the process of importing test questions into the LMS, searching for questions by standard in the LMS, and when building on a basic course shell. Some interview participants mentioned lacking prior exposure or experience teaching with the LMS before School A adopted the innovation. With that said, this may not affect newer teachers entering the field since chances are likely that they will use a LMS in a higher education setting. Interview Participant 1 mentioned her concern of a lack of consistency among teacher use of the LMS at School A, which feeds into another barrier addressed, which was lack of student knowledge of how to use the LMS. Finally, Interview Participant 3 drew attention to new and even first year teachers who may not make the LMS a priority when they have so many other teaching obligations to meet. More specifically, a number of barriers to effectively using the LMS were revealed in Interview Participant 3's opening response: (a) new technology is overwhelming; (b) new technology is time-consuming to learn; (c) learning new technology may not be a priority; (d) support for new teachers is inadequate when it comes to using the LMS; and (e) professional development/training for the LMS is limited.

The first recommendation from these findings is for administration and the district to highlight the steps and components required by the LMS, for teachers' "how-to" questions to be answered as soon as they arise, and for teachers to be shown specific ways to address any logistical problems that may arise with LMS use (Holloway, 2003). This includes providing teachers with adequate technical support for the LMS. Second, teachers should be given specific time blocks to work on their LMS both alone and with their colleagues. This would help minimize the issue of teachers having enough time to devote to the LMS on their own (which could positively influence teachers' PEOU) (Venkatesh & Davis, 2000). This would also help any teachers who are fearful or procrastinating when it comes to using the LMS in their

classroom. One of the most effective ways for the district and the schools' administration teams to send the message to teachers that the LMS is important and should be made a priority is by providing teachers with these designated time slots to either create or maintain their LMSs. This is especially important at the beginning of the school year. If administration does not make the LMS a priority, it would be difficult for all teachers to place value on the innovation. Third, ample opportunities for professional development should be offered so that trainings do not conflict with other items on the teachers' schedules. These trainings can be mandatory or optional. Careful thought should be given when deciding to make trainings either mandatory or optional since teachers have various technological needs. To make optional trainings more desirable, at least initially, teachers can be offered incentives, such as stipends, for their attendance. Fourth, extra support should be given to new or first year teachers or teachers simply new to teaching with the LMS (especially those with no prior LMS use in a student role). Finally, students should receive their own training on the LMS that is relevant and applicable to their uses of the LMS otherwise the teachers' efforts may be made in vain.

Discussion of Teacher Needs

The fifth, and final, topic of discussion focused on teacher needs, which refers to any necessities, desires, or requirements that teachers have to improve their LMS use. The evaluation question addressed in this section is:

- Evaluation Question 5: According to teachers, what are the ways the implementation of the LMS could be improved?

It is evident that general consensus among the participants was that, once again, teachers need to learn more about the LMS to help increase their self-reported proficiency level. This can be done through additional training and professional development. This does not mean a one-size-fits-all approach to training, but rather varied trainings to assist teachers of all ability levels.

Professional development should also be focused, hands-on, interactive and authentic. Gunter and Reeves (2016) conducted a study that found when teachers' time is spent in authentic professional development and training that focused on the actual tool and included planning, designing and integrating that technology or device into their own curriculum specific content, teachers were more proficient and showed a positive attitude toward implementation. With an acknowledgment that the majority of survey participants would like to maximize the LMS's effects, this is an indication that most teachers harbor positive feelings toward the LMS and are not resistant to it. Furthermore, an increased collaboration of the LMS and direct exposure to how others are using the LMS may, in turn, positively impact teachers' subjective norm (a TAM variable) (Venkatesh & Davis, 2000). Survey respondents' ratings to Questionnaire Items 27 and 29 not only demonstrate a need of the teachers but also imply that respondents perceive the LMS as beneficial to their job or task performance. With survey respondents expressing such a high interest in coordinating their efforts with others to maximize the LMS's effects as well as a high desire to know what other faculty are doing with the LMS, it can be interpreted that respondents view the LMS as valuable, useful and even advantageous to their job.

From these findings, it is recommended that training allow teachers with designated time to explore the LMS and to actually implement what they have learned in the training in their own courses. It would also allow teachers to expand their knowledge of existing features in the LMS and could even provide them with ways to complete their job more efficiently. Next, teachers

need support to take steps to make their courses more interactive and engaging. Interview Participant 1 expressed that she desired her course evolve into more than just a hub of course materials. Additionally, it is recommended for teachers to reach out to the maker of the LMS to request features or to make suggestions, as this will give teachers more ownership in the innovation. For example, it could be advised to the maker of the LMS to make assessments within the LMS even more secure (based on feedback from teachers), which was an issue previously raised by an interview participant. Or it could be recommended to the LMS creator to make existing features (such as using the existing question bank within the LMS to explore previously generated questions or to tag questions with standards) more user-friendly by giving specific feedback. From the questionnaire responses, participants expressed a need for collaboration with colleagues with LMS use. Therefore, it is recommended to give teachers more opportunities to work with others, to assist others and/or receive assistance from others, and to relate what they are doing in the LMS with others (Holloway, 2003). An increase in collaboration and added opportunities to see how their colleagues are using the LMS should help positively influence teachers' subjective norm and, thus, their PU (Venkatesh & Davis, 2000). Use of the LMS for teacher collaboration could allow a teacher from one school in the district to reach out to a teacher in another school in the district and to start meaningful conversations. According to Hobbs and Coiro (2016), "collaboration is magic[—in] it and through it, people find new wellsprings of creativity that could not have emerged without the active participation of another individual" (p. 623). This would bring teachers from all over the district closer together to not only share effective resources but to also problem solve together. On a final note, Interview Participant 1 stated she used the LMS daily, and she acknowledged a need for faster

Internet; therefore, it is recommended that the institutions' equipment be maintained to support full LMS use.

Limitations of the Study

Once again, this formative process evaluation has several limitations. The study is built heavily on teacher perceptions expressed during the data collection process. The study focused on teachers who use a LMS to supplement their face-to-face instruction rather than using it to teach an online or blended course. The study was limited to 36 teachers at a public high school in central Florida who volunteered to participate, so the findings may not be generalizable. Data was collected in a short period of time. Teachers were the only stakeholders consulted during this study. Finally, the evaluator was familiar with the school selected for the study.

Implications

Overall, this formative process evaluation reinforced the potential of LMS use by teachers in the classroom, thereby justifying the need to refine the technological tool's implementation at an institution. With today's schools seeking more and more ways to provide rigorous, 21st century learning that is customized to its students, investing time and resources into a LMS is warranted. The study's findings offer implications for teachers and district/school administrators in terms of both practice and policy. As such, providing teachers with more information about integrating a LMS into their particular curriculum is a must. One way to accomplish integration would be by using the district-created curriculum plans to directly suggest ways for teachers to use the LMS in their courses. This would help provide teachers with

a starting point. Then with increased comfort and experience using the LMS, the teachers would be more likely to supplement their LMSs on their own. This would be up to the teachers to maintain their current LMSs and also to keep saved versions of their archived LMS courses. Since it is intended for the LMS to become an integral part of the classroom, it is vital for the district to provide advance notice (when possible) of any planned outages or downtime of the LMS. The district should also have a way to notify all users of new LMS features and to provide teachers with sufficient support and training. The next section encapsulates recommendations for improvements. Recommendations for future research are then provided.

Recommendations for Improvement Determined from the Study Findings

The formative evaluation process provides information needed to adjust teacher training of the LMS as well as the process of LMS implementation. After reviewing the findings of this formative process evaluation study, the following recommendations are suggested, by the evaluator, as refinements for continued LMS implementation processes:

1. **Professional Development.** To address the lack of knowledge of LMS use noted by survey participants and to increase the self-reported proficiency levels of teachers from novice, intermediate, and non-user to expert, adequate, ongoing, and relevant professional development should be provided. Training should allow for one-on-one and small group instruction. Trainings should be offered both on-site, at the district office, off-site at neighboring schools, and virtually through the LMS. How-to videos should be shared often. Training should be designed to assist users of all ability levels (e.g., novice, intermediate, expert) and when

possible, teachers should be given flexibility of which trainings to attend and when. Trainings should be offered online, face-to-face, and mixed mode to accommodate teachers' busy schedules. Finally, professional development should be hands-on, interactive, and authentic as research supports these attributes of training will allow teachers to learn the technology and integrate it within their curriculum (Gunter & Reeves, 2016).

2. **Incentives.** To give teachers more motivation to find time for the LMS in their instruction, incentives for teachers, such as stipends for completing professional development) should be offered. Teachers should also receive recognition for achieving certain course statistics in their own courses (e.g., highest student activity in the LMS) and using the LMS with students in interactive and engaging ways. This can be done through a periodic award or through a showcase of LMSs. Additional ways to incentivize teacher use of the LMS should be used. As mentioned in the TAM, offering teachers tangible benefits may help increase the result demonstrability of the LMS (Venkatesh & Davis, 2000). Examples of tangible benefits include increased revenue, increase in both productivity of process and personnel, process improvements, and freeing up of time due to increased efficiency.
3. **Collaboration.** With 89% of survey respondents acknowledging truth in the statement that they would like to coordinate their efforts with others to maximize the innovation's effects, teachers should be encouraged to share high quality courses. Basic course templates can even be shared to help teachers get started. Teachers should enroll in the courses of their Professional Learning Community

(PLC) members as an observer so they can see what others are doing. If a teacher is not assigned to a designated PLC at a school, he or she should reach out to other schools to connect with those who teach similar content. Hobbs and Coiro (2016) stress the importance of creative partnerships to the efforts of teachers with interests in digital literacy.

4. **Graphic Design.** To help teachers not feel so discouraged when looking at a blank course shell as well as teachers looking to make their courses more aesthetically pleasing, access to a bank of graphics including banners and buttons should be provided. If such a resource already exists, it should be demonstrated where teachers can access this resource and how to use it.
5. **Quality Course Control.** One way to indirectly address inconsistent LMS use across the school would be through review of the LMS courses. This would also help ensure that courses being created are of high quality. Therefore, teachers should be provided with a checklist of items to include in their courses. They should also be provided with a rubric for a quality course. With the checklist and rubric, examples of high quality courses should be provided as models. It is important that these tools are not used in a punitive way. Teachers highly-skilled in this area could serve as quality control to help teachers needing support.
6. **Focus Group/LMS Improvement Committee.** A focus group or committee should be created to serve as a bridge between the LMS creator and the school's teachers. This committee can meet once a month or as needed. Committee members can make suggestions to the LMS creator for improvements or to provide them with general feedback. By giving teachers more ownership in the

LMS use, it will help them resolve concerns to ultimately progress to the higher Stages of Concern (Holloway, 2003).

7. **Technology Leaders.** To satisfy both collaboration and professional development needs, it is crucial that Technology Leaders, or any person in a position to support others in their use of the LMS, be identified. Information on whom these people are, what they do, and how they can help should be clearly shared to teachers. Moreover, these leaders can share timely tips of the day or week in a place that would be highly viewed by teachers. Finally, each leader should be assigned to a different group of the teachers. Teachers could be split into groups alphabetically or by experience level. A separate group for new or first year teachers could be created. This would allow each group to receive proper support and assistance. The leader could even monitor courses of the teachers in his or her group to increase consistency of LMS use by teachers.
8. **Support for First Year and New Teachers.** As expressed in the interviews of Participants 2 and 3, extra support for first year or new teachers should be provided. The teachers could be assigned a Technology Leader to serve as a mentor for technological needs. Support should be both ongoing and spread out throughout the school year—not just at the beginning when this group of teachers may feel especially overwhelmed. This group can meet with a trainer each month to learn about different aspects of the LMS in a timely and relevant manner. This support should not result in additional work for these teachers, but rather help them manage their existing teaching tasks.

9. **Resources and Equipment.** As expressed by Interview Participant 1, the Internet should be fast enough to support LMS demand from all stakeholders and outages should be minimized. When possible, any system downtime should be communicated to users well in advance. Students should also have more opportunities to use LMSs on multiple devices during the school day.
10. **Support/Training for Students.** To help teachers experience more student buy-in when it comes to LMS use, a LMS workshop should be created specifically for students. It can be given as a freshman course taught in the Media Center by Media Center staff. New or transfer students that have no prior LMS experience should also receive training. This training would ultimately help familiarize students with virtual learning modalities, which can assist them in successfully meeting their graduation requirement of completing at least one course online (Online Sunshine, 2017).

Recommendations for Future Research

Based on this formative process evaluation's findings, the following recommendations for future research are strongly encouraged:

1. Further research should be carried out through future use of the SoCQ. In other words, in the next school year, it is suggested that teachers take the SoCQ again in the beginning of the year and at the end of the year (similar to a pre- and post-test). This should be repeated each school year that the LMS is in use to show how teachers are progressing through the Stages of Concern and to continuously identify ways to refine implementation of the LMS.

2. Further research should be gathered periodically through focus groups created to check in with teachers so that they may be asked about their perceptions, opinions, beliefs, and attitudes toward the LMS in an ongoing manner.
3. Additional research should be conducted to collect actual samples of how teachers are using the LMS. For instance, what types of content are they uploading? Which LMS features are they using with their students?
4. Additional research should be conducted to provide teachers with guidelines to create a quality course online.
5. Further research should be conducted on ways to incentivize teachers to create and maintain high-quality courses to supplement their face-to-face instruction.
6. Additional research should explore student use, perceptions and concerns when it comes to using the LMS as a learning tool.
7. Additional research should be conducted on the relationship between student motivation and learning and the use of a learning management system.
8. Additional research should ask students how they would like to use the LMS to enhance their learning.
9. Additional research should be conducted to determine if students have appropriate access to the Internet at home.
10. Additional research should be conducted on how best to prepare students new to the LMS to use the system effectively.
11. Additional research should be conducted to include statistics of both teacher and student login information (e.g., how long are users logged in and what are users clicking on?)

12. Further research should focus on other stakeholders, such as parents and administrators.

Conclusion

As today's schools continue to shift from the Industrial Age to the Information Age, integrating powerful technological tools in the curriculum requires careful, thoughtful implementation and ongoing support for all stakeholders—especially teachers. Each teacher will approach a new program with his or her own concerns, so helping educators reconcile these concerns is imperative to program survival and actual changes to be brought out by the program. (Holloway, 2003). This study examined secondary teachers' perceptions, concerns, and integration of the LMS at a public high school located in central Florida. Teachers' concerns were investigated through the use of the CBAM as a framework, the SoCQ as a survey instrument, and structured one-on-one interviews. The sample population for this study consisted of secondary teachers at School A. A total of 36 teachers participated in the online survey and three of the teachers surveyed participated in follow-up interviews. The findings revealed that the study's survey participants, on average, had the highest concerns at Stage 0 (Unconcerned), Stage 1 (Informational) and Stage 2 (Personal), thus indicating the group conformed to a non-user profile for LMS use. The findings also revealed that teachers had an overall positive disposition toward the LMS, yet more to learn about its capabilities. The findings of this study provided both implications and recommendations to stakeholders associated with LMS implementation. In addition, follow-up studies that focus on the student perspective of the LMS could help any further understanding of what it takes to successfully implement a LMS in a K-12

school. This is especially important since students in the state of Florida are currently required to complete at least one online course in order to satisfy graduation requirements (Online Sunshine, 2017). With such an expectation being placed on students, school leaders must consider how this requirement is affecting students. This consideration can ultimately answer what concerns students have about online learning, the tangible benefits of this graduation requirement, the barriers students face in their online learning experiences, and what students need to be successful in their online coursework.

APPENDIX A: UCF IRB APPROVAL LETTER



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1
FWA00000351, IRB00001138**

To: **Glenda A. Gunter and Co-PI: Victoria M. Franzese**

Date: **March 01, 2017**

Dear Researcher:

On 03/01/2017, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: A FORMATIVE EVALUATION STUDY OF TEACHER
USAGE OF [REDACTED] A LEARNING MANAGEMENT
SYSTEM) IN A K-12 PUBLIC SCHOOL
Investigator: Glenda A. Gunter
IRB Number: SBE-17-12963
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

A handwritten signature in black ink, appearing to read "Victoria M. Franzese".

IRB Coordinator

APPENDIX B: UCF IRB APPROVAL LETTER (MODIFICATIONS)



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1
FWA00000351, IRB00001138**

To: **Dr Glenda A. Gunter and Co-PI: Victoria M. Franzese**

Date: **April 11, 2017**

Dear Researcher:

On 04/11/2017, the IRB approved the following activity as minor modifications to human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Modification Type: Revised Interview Questions.
Project Title: A FORMATIVE EVALUATION STUDY OF TEACHER
USAGE OF [REDACTED] A LEARNING MANAGEMENT
SYSTEM) IN A K-12 PUBLIC SCHOOL
Investigator: Dr Glenda A. Gunter
IRB Number: SBE-17-12963
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

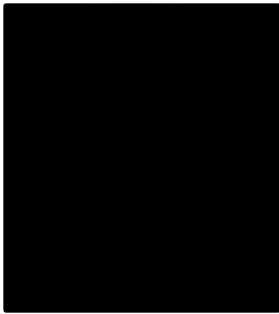
On behalf of Sophia Dziegielewska, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

A handwritten signature in black ink that reads "Kamille Chaparro".

Signature applied by Kamille Chaparro on 04/11/2017 08:44:28 AM EDT

IRB Coordinator

**APPENDIX C: SCHOOL DISTRICT PERMISSION TO CONDUCT
STUDY LETTER**



March 17, 2017

Victoria Franzese



Dear Ms. Franzese,



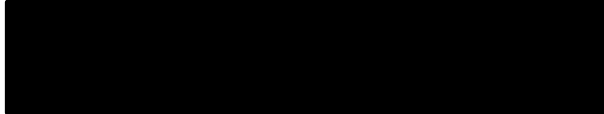
I am in receipt of the proposal and supplemental information that you submitted for permission to conduct research in [REDACTED]. Thank you for very clearly delineating the required components of the research request. After a review of these documents, it has been determined that you are granted permission to conduct the study described herein.



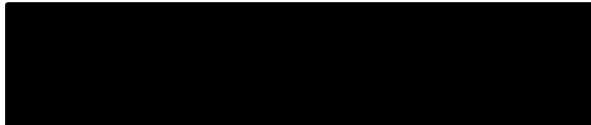
Your project, *A Formative Evaluation Study of Teacher Usage of [REDACTED] (A Learning Management System) in a K-12 Public School* is of interest to the district. Your first order of business is to confirm with [REDACTED] that you have permission to conduct the study on [REDACTED] campus.

We look forward to receiving a copy of your results. Best of luck!

Respectfully,



cc.



**APPENDIX D: TEACHER INVITATION TO PARTICIPATE IN SURVEY
AND INTERVIEW E-MAILS**

First Contact – Teacher Survey

Dear Faculty Member:

Within the next few days, you will receive a request in your email to fill out a brief survey for an important evaluation project being conducted by myself as part of my dissertation research, which is part of my Doctor of Education program at the University of Central Florida.

The survey is investigating the concerns of secondary teachers when it comes to using a Learning Management System (LMS). It specifically focuses on ways teachers are currently using the LMS and obstacles teachers face when using the LMS in their courses.

This email is to let you know that you have been chosen to participate in my study. The evaluation study is designed to help me understand how we may better help teachers use the LMS effectively with students.

Thank you for your time and consideration. It is only with the generous help of people like you that my research can be successful.

Sincerely,

Victoria Franzese, MA

Second Contact – Teacher Survey

Dear Faculty Member:

A few days ago I sent you an email asking you to participate in an evaluation project conducted by myself as part of my dissertation requirement within my Ed.D. program at UCF.

This e-mail is a follow-up to kindly ask you to help me conduct my study. This study is part of an academic effort to learn what obstacles secondary teachers face when using a Learning Management System (LMS) in the classroom.

Your participation is very important for both students and yourself as a teacher, as the results from this study will lead to a better understanding of the obstacles teachers face when it comes to teaching with technology.

With that said, I kindly ask you to take a few minutes and share your opinions with me about your perceptions of the LMS by filling out the survey (see link below). The survey will take less than 20 minutes to complete.

[INSERT SURVEY LINK]

Please be assured of the confidentiality of your answers. I will not identify individual respondents in any of the reports emanating from the survey responses. Your participation in this study is voluntary. However, your response would be of great value to me and your colleagues.

If you have any questions or comments about this study, please direct them to me by calling [REDACTED] or by emailing [REDACTED] I would be happy to assist you in any way I can.

If, for some reason, you prefer not to receive future emails of this nature, please reply with your request, and I will remove you from my mailing list.

Thank you so much for your participation in this study. I really appreciate your opinion.

Sincerely,

Victoria Franzese, MA

Third Contact – Teacher Survey

Dear Faculty Member:

Last week, a survey seeking your opinion on your use of a Learning Management System (LMS) was sent to you.

I want to thank you for taking the time to participate in my study. If you have not yet had the time to complete the questionnaire, please do so today. I know that you are busy, but your response will determine the success of my study.

If by chance, you lost the survey link or you did not receive it, here is the link again:

[INSERT SURVEY LINK]

Thank you again for your participation.

Sincerely,

Victoria Franzese, MA

First Contact – Teacher Interview

Dear Faculty Member:

I am writing to invite you to participate in an interview for an important evaluation project being conducted by myself as part of my dissertation research, which is part of my Doctor of Education program at the University of Central Florida.

The interview is investigating the concerns of secondary teachers when it comes to using a Learning Management System (LMS). It specifically focuses on ways teachers are currently using the LMS and obstacles teachers face when using the LMS in their courses.

The evaluation study is designed to help me understand how we may better help teachers use the LMS effectively with students. Your participation is very important for both students and yourself as a teacher. With that said, if you would like to participate in the interview, please respond to me so that we may schedule a date and time. The interview should take no more than 30 minutes to complete.

Please be assured of the confidentiality of your answers. I will not identify individual respondents in any of the reports emanating from the interview sessions. Your participation in this study is voluntary. However, your response would be of great value to me and your colleagues.

If you have any questions or comments about this study, please direct them to me by calling [REDACTED] or by emailing [REDACTED]. I would be happy to assist you in any way I can.

Thank you for your time and consideration. It is only with the generous help of people like you that my research can be successful.

Sincerely,

Victoria Franzese, MA

Second Contact – Teacher Interview

Dear Faculty Member:

Last week, an invitation to participate in an interview seeking your opinion on the perceptions and use of a Learning Management System (LMS) was sent to you.

If you have already volunteered to be interviewed, I want to thank you for taking the time to participate in my study. If you have not yet had the time to schedule an interview with me, please do so today. I know that you are busy, but your response will determine the success of my study.

Thank you again for your participation.

Sincerely,

Victoria Franzese, MA

APPENDIX E: INFORMED CONSENT FOR SURVEY



EXPLANATION OF RESEARCH

Title of Project: *A FORMATIVE PROCESS EVALUATION STUDY OF TEACHER USAGE OF A LEARNING MANAGEMENT SYSTEM IN A K-12 PUBLIC SCHOOL*

Principal Investigator: *Victoria Franzese, MA*

Faculty Supervisor: *Dr. Glenda Gunter, Ph.D.*

You are being invited to take part in a research study. Whether you take part is up to you.

- Purpose of the research study: The purpose of this study is to understand secondary teachers' perceptions of a Learning Management System (LMS).
- What you will be asked to do in the study: You will be asked to participate in an online survey designed to explore your perceptions about your use of the LMS. You do not have to answer every question or complete every task.
- Time required: We expect that you will be in this research study for only the duration of responding to the survey. The survey itself will take no more than 20 minutes.

You must be 18 years of age or older to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, please contact: *Victoria Franzese, Graduate Student, Ed.D. Education Program, College of Education and Human Performance,* [REDACTED] *or Dr. Glenda Gunter, Faculty Supervisor, Ed.D. Program Adviser at* [REDACTED]

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX F: SURVEY INSTRUMENT

Part I Stages of Concern Questionnaire (SoCQ)

(George, Hall, & Stiegelbauer, 2006)

The purpose of this questionnaire is to determine what people who are using or thinking about using various programs are concerned about at various times during the adoption process.

The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years' experience using them. Therefore, **many of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time.** For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

This statement is very true of me at this time. 0 1 2 3 4 5 6 7

This statement is somewhat true of me now. 0 1 2 3 4 5 6 7

This statement is not at all true of me at this time. 0 1 2 3 4 5 6 7

This statement seems irrelevant to me. 0 1 2 3 4 5 6 7

Please respond to the items in terms of **your present concerns**, or how you feel about your involvement with **this** innovation. We do not hold to any one definition of the innovation so please think of it in terms of your own perception of what it involves. Phrases such as "this approach" and "the new system" all refer to the same innovation. Remember to respond to each item in terms of your present concerns about your involvement or potential involvement with the innovation.

Thank you for taking time to complete this task.

0	1	2	3	4	5	6	7
Irrelevant	Not true of me now			Somewhat true of me now			Very true of me now
1. I am concerned about students' attitudes toward the innovation.	0	1	2	3	4	5	6 7
2. I now know of some other approaches that might work better.	0	1	2	3	4	5	6 7
3. I am more concerned about another innovation.	0	1	2	3	4	5	6 7
4. I am concerned about not having enough time to organize myself each day.	0	1	2	3	4	5	6 7
5. I would like to help other faculty in their use of the innovation.	0	1	2	3	4	5	6 7
6. I have a very limited knowledge of the innovation.	0	1	2	3	4	5	6 7
7. I would like to know the effect of reorganization on my professional status.	0	1	2	3	4	5	6 7

0	1	2	3	4	5	6	7	
Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now		
8. I am concerned about conflict between my interests and my responsibilities.	0	1	2	3	4	5	6	7
9. I am concerned about revising my use of the innovation.	0	1	2	3	4	5	6	7
10. I would like to develop working relationships with both our faculty and outside faculty using this innovation.	0	1	2	3	4	5	6	7
11. I am concerned about how the innovation affects students.	0	1	2	3	4	5	6	7
12. I am not concerned about the innovation at this time.	0	1	2	3	4	5	6	7
13. I would like to know who will make the decisions in the new system.	0	1	2	3	4	5	6	7
14. I would like to discuss the possibility of using the innovation.	0	1	2	3	4	5	6	7
15. I would like to know what resources are available if we decide to adopt the innovation.	0	1	2	3	4	5	6	7
16. I am concerned about my inability to manage all that the innovation requires.	0	1	2	3	4	5	6	7
17. I would like to know how my teaching or administration is supposed to change.	0	1	2	3	4	5	6	7
18. I would like to familiarize other departments or persons with the progress of this new approach.	0	1	2	3	4	5	6	7
19. I am concerned about evaluating my impact on students.	0	1	2	3	4	5	6	7
20. I would like to revise the innovation's approach.	0	1	2	3	4	5	6	7
21. I am preoccupied with things other than the innovation.	0	1	2	3	4	5	6	7
22. I would like to modify our use of the innovation based on the experiences of our students.	0	1	2	3	4	5	6	7
23. I spend little time thinking about the innovation.	0	1	2	3	4	5	6	7
24. I would like to excite my students about their part in this approach.	0	1	2	3	4	5	6	7
25. I am concerned about time spent working with nonacademic problems related to the innovation.	0	1	2	3	4	5	6	7
26. I would like to know what the use of the innovation will require in the immediate future.	0	1	2	3	4	5	6	7
27. I would like to coordinate my efforts with others to maximize the innovation's effects.	0	1	2	3	4	5	6	7
28. I would like to have more information on time and energy commitments required by the innovation.	0	1	2	3	4	5	6	7

0	1	2	3	4	5	6	7	
Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now		
29. I would like to know what other faculty are doing in this area.	0	1	2	3	4	5	6	7
30. Currently, other priorities prevent me from focusing my attention on the innovation.	0	1	2	3	4	5	6	7
31. I would like to determine how to supplement, enhance, or replace the innovation.	0	1	2	3	4	5	6	7
32. I would like to use feedback from students to change the program.	0	1	2	3	4	5	6	7
33. I would like to know how my role will change when I am using the innovation.	0	1	2	3	4	5	6	7
34. Coordination of tasks and people is taking too much of my time.	0	1	2	3	4	5	6	7
35. I would like to know how the innovation is better than what we have now.	0	1	2	3	4	5	6	7

Please complete the following:

36. How long have you been involved with the innovation, not counting this year?

Never ___ 1 year ___ 2 years ___ 3 years ___ 4 years ___ 5 or more ___

37. In your use of the innovation, do you consider yourself to be a:

non-user ___ novice ___ intermediate ___ old hand (expert) ___ past user ___

38. Have you received formal training regarding the innovation (e.g., workshops, courses)?

Yes ___ No ___

39. Are you currently in the first or second year of use of some major innovation or program other than this one?

Yes ___ No ___

If yes, please describe briefly: _____

Part II Demographic Questions

1. Select your gender

- a. Male
- b. Female

2. What is your age?
 - a. 21 or under
 - b. 22-25
 - c. 26-30
 - d. 31-35
 - e. 36-40
 - f. 41-45
 - g. 46-50
 - h. 51-55
 - i. 56-60
 - j. 61+

3. What is your race/ethnicity?
 - a. Caucasian
 - b. Hispanic or Latino
 - c. Black or African American
 - d. Native American or American Indian
 - e. Asian/Pacific Islander
 - f. Other

4. What is the highest degree that you completed?
 - a. High School/GED
 - b. Bachelor's Degree
 - c. Master's Degree
 - d. Specialist
 - e. Ph.D. or Ed.D.

5. Select the number of years of teaching experience:
 - a. 0-3 years
 - b. 4-6 years
 - c. 7-10 years
 - d. 11-15 years
 - e. 16-20 years
 - f. 21-25 years
 - g. 26-30 years
 - h. 31+ years

6. Of those years, how many years have you taught at School A?

**APPENDIX G: AGREEMENT FOR PERMISSION TO REPUBLISH –
PRINT & ELECTRONIC FOR STAGES OF CONCERN QUESTIONNAIRE**



AGREEMENT FOR PERMISSION TO REPUBLISH — PRINT & ELECTRONIC

Please fill out, sign, and return copy to American Institutes for Research, Attn: Helen Sacco; 1120 E. Diehl Road, Suite 200; Naperville, Illinois 60563-1486; hsacco@air.org.

American Institutes for Research in the Behavioral Sciences (hereinafter called the "grantor") grants the undersigned, Victoria Franzese, Doctoral Student, University of Central Florida (hereinafter called the "applicant"), nonexclusive license to reprint the following (hereinafter called "the selection"):

Title and Credit Line: George, A. A., Hall, G. E., & Stiegelbauer, S. M. (2006). Measuring implementation in schools: The Stages of Concern Questionnaire, Appendices A-C, pages 77-91. Austin, TX: SEDL. A revised PDF version was uploaded in 2014 and is accessible at http://www.sedl.org/cbam/socq_manual_201410.pdf.

The undersigned agrees:

- 1. To give full credit in every copy printed; on the copyright page or as a footnote on the page on which the selection begins; or, if in a magazine or a newspaper, on the first page of each selection covered by the permission, exactly as indicated in this Agreement.
2. To make no deletions from, additions to, changes to, or electronic manipulation of the content without the written approval of the grantor.
3. That permission granted herein is nonexclusive and nontransferable.
4. That permission applies, unless otherwise stated, solely to reprint the selection in a dissertation titled A Formative Evaluation Study of Teacher Usage of [redacted] A Learning Management System in a K-12 Public School, in all languages and forms and in subsequent revisions in the United States and internationally.
5. That the permission shall automatically terminate at the end of the business day of August 30, 2019.
6. This permission does not extend to any copyrighted material from other sources that may be incorporated within the work in question—nor to any diagrams, illustrations, charts, or graphs—unless otherwise specified.
7. That the work containing grantor's selection may be reproduced in Braille, large type, and sound recordings provided no charge is made to the visually handicapped.
8. That unless the agreement is signed and returned within three months from the date of issue, the permission shall automatically terminate.

Date: 2-23-17

Signature of Applicant: Victoria Franzese

Printed Name: Victoria Franzese

Address: [redacted]
4000 Central Florida Blvd.
Orlando, FL 32816 (School)

Permission on the foregoing terms granted by American Institutes for Research:

Date: February 24, 2017

By: Helen Sacco
Helen Sacco, Editor/Copyright Permissions Specialist

APPENDIX H: INFORMED CONSENT FOR INTERVIEW



EXPLANATION OF RESEARCH

Title of Project: *A FORMATIVE PROCESS EVALUATION STUDY OF TEACHER USAGE OF A LEARNING MANAGEMENT SYSTEM IN A K-12 PUBLIC SCHOOL*

Principal Investigator: *Victoria Franzese, MA*

Faculty Supervisor: *Dr. Glenda Gunter, Ph.D.*

You are being invited to take part in a research study. Whether you take part is up to you.

- Purpose of the research study: The purpose of this study is to understand secondary teachers' perceptions of a Learning Management System (LMS).
- What you will be asked to do in the study: You will be asked to participate in a face-to face or telephone interview designed to explore your perceptions about your use of a LMS. You do not have to answer every question or complete every task. For accuracy purposes, the interview audio will be recorded. The audio recording will be destroyed as soon as possible after transcription.
- Time required: The interview itself will take no more than 30 minutes. A report will be developed of the interview session with the researchers' interpretation of your responses. This report will be shared with you, if you so desire, for your feedback on accuracy.

You must be 18 years of age or older to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, please contact: *Victoria Franzese, Graduate Student, Ed.D. Education Program, College of Education and Human Performance, [REDACTED] or Dr. Glenda Gunter, Faculty Supervisor, Ed.D. Program Adviser at [REDACTED]*

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX I: INTERVIEW INSTRUMENT

Interview Questions

Frequency of Use/Ease of Use/Convenience

1. How often do you access your own LMS? (e.g., daily, weekly, monthly, etc.)
2. How often do you update your own LMS? (e.g., daily, weekly, monthly, etc.)
3. What would you rate the LMS's ease of use on a scale of 1-5 (1 being the easiest and 5 being the most difficult) and why?
4. How convenient is it for you to update your LMS?

Digital Content

5. What types of content do you typically post on your LMS? (e.g., announcements, modules, audio, video, discussion boards, assignments, URLs, course notes, etc.)

Self-Efficacy

6. How long have you been using this particular LMS?
7. How would you rate your proficiency level when it comes to your use of the LMS and why? (e.g., beginner, intermediate, advanced)

Resources

8. What resources do you use when you need help with the LMS? (e.g., peer teacher, administration, district personnel, online tutorials, the LMS's provided tech support, etc.)

Devices

9. Do you use the LMS's mobile app? If not, why not?
10. Do your students access the LMS mostly during or after school?

Student Engagement

11. How do you use the LMS with your students?
12. In what ways has the LMS enhanced your teaching/your curriculum?
13. How often do you think your students access your LMS? (e.g., daily, weekly, monthly, etc.)

14. Which feature in the LMS do your students find most engaging? Why?
15. Are you currently using any blended learning models in your classroom? If so, which models and how is it going?
16. How do you use the LMS to offer differentiated instruction for your students?

Perceived Learning Outcome

17. How is the LMS helping your students?

Professional Development

18. What is something you wish you could do in the LMS that is currently not a feature?
19. What types of training have you received for the LMS? How frequent is the training? When was the last training you received and how long did it last?

Tech Support

20. Have you ever contacted the LMS's tech support? If so, describe your experience.
21. Describe any recent issues you have experienced with the LMS including how frequently each issue arises.

Learning

22. Are you enrolled in any LMSs besides your own? If so, which courses?

Overall Satisfaction

23. Have you used any Learning Management Systems in the past? If so, when/how?
24. What is your favorite teaching feature in the LMS and why?
25. How satisfied are you with using the LMS as a teaching tool? Why?

APPENDIX J: DATA COLLECTION BLUEPRINT

Evaluation Questions	Data Type	Instrument	Sample
Level 1: WHAT ARE THE TEACHERS' PERCEPTIONS OF THE LMS?			
1. According to the Concerns-Based Adoption Model, what stage(s) of concern (regarding the LMS) do teachers perceive to be the most intense? (Stages of Concern Profile)	Quantitative	Online Survey Items: 1-35	Teachers
2. What are teachers' reactions to and perceptions of the implementation of the LMS? (Teacher Concerns)	Quantitative	Online Survey Items: 1, 2, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 25, 26, 33, 35, 37, 38	Teachers
	Qualitative	Phone Interview Questions: 2, 4, 5, 8, 9, 11, 12, 14, 19, 22, 23, 25	Teachers
3. According to teachers, in what ways is the LMS successfully implemented by teachers? (Benefits of the LMS)	Quantitative	Online Survey Items: 5, 10, 11, 18, 24	Teachers
	Qualitative	Phone Interview Questions: 3, 6, 8, 10, 11, 12, 13, 14, 16, 17, 22, 24	Teachers
Level 2: ACCORDING TO TEACHERS, HOW CAN THE IMPLEMENTATION OF THE LMS BE IMPROVED?			
4. According to teachers, what are internal and external factors, if any, impacting the use of the LMS? (Barriers to the LMS)	Quantitative	Online Survey Items: 2, 3, 6, 11, 13, 16, 21, 23, 28, 30, 34, 36, 39	Teachers
	Qualitative	Phone Interview Questions: 1, 3, 5, 6, 7, 8, 10, 13, 15, 17, 20, 21, 22	Teachers
5. According to teachers, what are the ways the implementation of the LMS could be improved? (Teacher Needs)	Quantitative	Online Survey Items: 4, 15, 19, 20, 22, 27, 29, 31, 32, 38	Teachers
	Qualitative	Phone Interview Questions: 7, 8, 18, 19, 20, 21	Teachers
6. What are the most important unresolved concerns for teachers (regarding the LMS) and how might they be resolved? (Stages of Concern Profile)	Quantitative	Online Survey Items: 1-35	Teachers

**APPENDIX K: STAGES OF CONCERN QUESTIONNAIRE SCORES FOR
INDIVIDUAL SURVEYS**

Survey 1	0		1		2		3		4		5		6	
	3	5	6	4	7	6	4	6	1	5	5	6	2	5
	12	1	14	6	13	5	8	4	11	5	10	5	9	3
	21	4	15	6	17	5	16	1	19	2	18	5	20	4
	23	2	26	5	28	6	25	5	24	6	27	5	22	3
	30	2	35	5	33	5	34	4	32	5	29	5	31	4
Raw Scores		14		26		27		20		23		26		19
Percentile Scores		81		91		89		77		43		72		60

Survey 2	0		1		2		3		4		5		6	
	3	1	6	0	7	0	4	4	1	1	5	5	2	5
	12	7	14	1	13	6	8	0	11	1	10	3	9	0
	21	1	15	4	17	2	16	0	19	1	18	6	20	1
	23	0	26	2	28	2	25	3	24	7	27	6	22	1
	30	1	35	1	33	5	34	0	32	5	29	7	31	5
Raw Scores		10		8		15		7		15		27		12
Percentile Scores		55		37		57		23		16		76		30

Survey 3	0		1		2		3		4		5		6	
	3	1	6	1	7	1	4	3	1	4	5	4	2	1
	12	5	14	5	13	6	8	4	11	6	10	4	9	6
	21	4	15	6	17	4	16	5	19	6	18	3	20	1
	23	4	26	6	28	6	25	4	24	5	27	6	22	3
	30	5	35	3	33	6	34	5	32	6	29	6	31	6
Raw Scores		19		21		23		21		27		23		17
Percentile Scores		97		75		80		80		63		59		52

Survey 4	0		1		2		3		4		5		6	
	3	6	6	3	7	3	4	4	1	3	5	4	2	3
	12	3	14	6	13	6	8	3	11	4	10	5	9	2
	21	5	15	6	17	7	16	4	19	5	18	6	20	6
	23	3	26	3	28	6	25	3	24	3	27	4	22	5
	30	6	35	6	33	7	34	5	32	5	29	6	31	6
Raw Scores		23		24		29		19		20		25		22
Percentile Scores		99		88		92		73		30		68		73

Survey 5	0		1		2		3		4		5		6	
	3	7	6	0	7	7	4	7	1	7	5	7	2	7
	12	0	14	7	13	7	8	0	11	7	10	7	9	0
	21	3	15	7	17	7	16	0	19	7	18	7	20	7
	23	3	26	7	28	7	25	6	24	7	27	7	22	7
	30	0	35	7	33	7	34	0	32	7	29	7	31	7
Raw Scores		13		28		35		13		35		35		28
Percentile Scores		75		95		99		47		96		98		92

Survey 6	0		1		2		3		4		5		6	
	3	5	6	2	7	4	4	5	1	3	5	2	2	2
	12	2	14	1	13	4	8	1	11	3	10	2	9	2
	21	5	15	3	17	4	16	4	19	2	18	1	20	1
	23	1	26	5	28	4	25	6	24	4	27	2	22	2
	30	4	35	5	33	4	34	4	32	5	29	3	31	3
Raw Scores		17		16		20		20		17		10		10
Percentile Scores		94		60		72		77		21		14		22

Survey 7	0		1		2		3		4		5		6	
	3	0	6	2	7	6	4	7	1	1	5	3	2	3
	12	5	14	2	13	6	8	4	11	6	10	0	9	3
	21	7	15	6	17	7	16	7	19	6	18	3	20	1
	23	7	26	4	28	6	25	7	24	0	27	1	22	6
	30	7	35	7	33	6	34	6	32	7	29	7	31	1
Raw Scores		26		21		31		31		20		14		14
Percentile Scores		99		75		95		98		30		25		38

Survey 8	0		1		2		3		4		5		6	
	3	1	6	1	7	0	4	1	1	3	5	6	2	1
	12	7	14	1	13	1	8	0	11	1	10	6	9	0
	21	1	15	1	17	4	16	1	19	3	18	6	20	0
	23	5	26	5	28	1	25	1	24	5	27	7	22	5
	30	1	35	1	33	1	34	1	32	4	29	4	31	1
Raw Scores		15		9		7		4		16		29		7
Percentile Scores		87		40		31		11		19		84		14

Survey 9	0		1		2		3		4		5		6	
	3	1	6	4	7	5	4	3	1	1	5	2	2	1
	12	4	14	3	13	5	8	2	11	5	10	0	9	5
	21	6	15	0	17	4	16	1	19	4	18	0	20	3
	23	6	26	6	28	4	25	1	24	1	27	5	22	1
	30	6	35	0	33	4	34	0	32	2	29	1	31	1
Raw Scores		23		13		22		7		13		8		11
Percentile Scores		99		51		78		23		11		10		26

Survey 10	0		1		2		3		4		5		6	
	3	6	6	1	7	2	4	3	1	6	5	5	2	6
	12	1	14	4	13	2	8	5	11	7	10	3	9	4
	21	4	15	6	17	5	16	4	19	5	18	3	20	4
	23	4	26	4	28	4	25	5	24	3	27	6	22	6
	30	5	35	7	33	5	34	6	32	4	29	6	31	3
Raw Scores		20		22		18		23		25		23		23
Percentile Scores		98		80		67		85		54		59		77

Survey 11	0		1		2		3		4		5		6	
	3	3	6	2	7	3	4	4	1	5	5	1	2	4
	12	3	14	5	13	5	8	2	11	5	10	4	9	3
	21	3	15	5	17	4	16	3	19	2	18	3	20	2
	23	3	26	5	28	4	25	5	24	3	27	5	22	3
	30	2	35	5	33	4	34	2	32	4	29	6	31	2
Raw Scores		14		22		20		16		19		19		14
Percentile Scores		81		80		72		60		27		44		38

Survey 12	0		1		2		3		4		5		6	
	3	6	6	5	7	0	4	7	1	1	5	7	2	5
	12	1	14	4	13	7	8	3	11	0	10	5	9	5
	21	7	15	4	17	5	16	7	19	7	18	0	20	3
	23	7	26	7	28	5	25	7	24	3	27	5	22	7
	30	7	35	6	33	3	34	7	32	6	29	5	31	6
Raw Scores		28		26		20		31		17		22		26
Percentile Scores		99		91		72		98		21		55		87

Survey 13	0		1		2		3		4		5		6	
	3	1	6	3	7	1	4	6	1	2	5	1	2	1
	12	5	14	0	13	6	8	2	11	2	10	5	9	6
	21	5	15	0	17	5	16	5	19	1	18	1	20	5
	23	4	26	5	28	0	25	2	24	7	27	5	22	7
	30	6	35	0	33	3	34	2	32	1	29	7	31	5
Raw Scores		21		8		15		17		13		19		24
Percentile Scores		99		37		57		65		11		44		81

Survey 14	0		1		2		3		4		5		6	
	3	1	6	6	7	6	4	6	1	1	5	2	2	1
	12	1	14	4	13	1	8	4	11	6	10	3	9	7
	21	7	15	7	17	6	16	7	19	6	18	3	20	3
	23	2	26	7	28	5	25	5	24	6	27	6	22	6
	30	1	35	6	33	6	34	6	32	6	29	5	31	6
Raw Scores		12		30		24		28		25		19		23
Percentile Scores		69		97		83		95		54		44		77

Survey 15	0		1		2		3		4		5		6	
	3	4	6	4	7	4	4	6	1	5	5	2	2	3
	12	2	14	5	13	5	8	4	11	3	10	3	9	3
	21	4	15	5	17	4	16	4	19	2	18	4	20	1
	23	6	26	5	28	6	25	3	24	3	27	6	22	3
	30	7	35	5	33	6	34	5	32	6	29	7	31	6
Raw Scores		23		24		25		22		19		22		16
Percentile Scores		99		88		85		83		27		55		47

Survey 16	0		1		2		3		4		5		6	
	3	3	6	0	7	0	4	3	1	0	5	3	2	3
	12	7	14	0	13	0	8	0	11	0	10	2	9	0
	21	3	15	0	17	0	16	0	19	0	18	1	20	0
	23	7	26	0	28	0	25	1	24	4	27	3	22	2
	30	1	35	0	33	0	34	0	32	3	29	3	31	0
Raw Scores		21		0		0		4		7		12		5
Percentile Scores		99		5		5		11		4		19		9

Survey 17	0		1		2		3		4		5		6	
	3	4	6	2	7	6	4	6	1	4	5	5	2	6
	12	1	14	5	13	6	8	6	11	6	10	5	9	6
	21	6	15	6	17	6	16	6	19	6	18	4	20	5
	23	2	26	6	28	6	25	6	24	6	27	6	22	6
	30	5	35	5	33	6	34	6	32	5	29	6	31	3
Raw Scores		18		24		30		30		27		26		26
Percentile Scores		96		88		94		97		63		72		87

Survey 18	0		1		2		3		4		5		6	
	3	1	6	1	7	1	4	7	1	1	5	2	2	3
	12	7	14	1	13	7	8	2	11	1	10	1	9	1
	21	7	15	1	17	7	16	2	19	7	18	1	20	1
	23	3	26	1	28	1	25	1	24	1	27	3	22	1
	30	7	35	1	33	1	34	7	32	1	29	4	31	3
Raw Scores		25		5		17		19		11		11		9
Percentile Scores		99		27		63		73		8		16		20

Survey 19	0		1		2		3		4		5		6	
	3	1	6	3	7	5	4	3	1	0	5	2	2	1
	12	1	14	2	13	7	8	1	11	4	10	4	9	1
	21	5	15	7	17	4	16	1	19	1	18	4	20	1
	23	5	26	0	28	1	25	3	24	1	27	3	22	1
	30	4	35	6	33	1	34	1	32	0	29	7	31	7
Raw Scores		16		18		18		9		6		20		11
Percentile Scores		91		66		67		30		3		48		26

Survey 20	0		1		2		3		4		5		6	
	3	0	6	4	7	5	4	6	1	5	5	5	2	0
	12	2	14	2	13	1	8	3	11	5	10	5	9	5
	21	6	15	3	17	6	16	6	19	4	18	4	20	2
	23	6	26	7	28	4	25	7	24	6	27	6	22	6
	30	5	35	6	33	6	34	6	32	5	29	6	31	5
Raw Scores		19		22		22		28		25		26		18
Percentile Scores		97		80		78		95		54		72		57

Survey 21	0		1		2		3		4		5		6	
	3	2	6	2	7	3	4	2	1	4	5	3	2	3
	12	5	14	2	13	3	8	1	11	3	10	3	9	3
	21	4	15	3	17	3	16	3	19	3	18	2	20	3
	23	6	26	3	28	3	25	4	24	3	27	3	22	2
	30	4	35	5	33	3	34	4	32	3	29	3	31	3
Raw Scores		21		15		15		14		16		14		14
Percentile Scores		99		57		57		52		19		25		38

Survey 22	0		1		2		3		4		5		6	
	3	1	6	2	7	1	4	1	1	7	5	3	2	1
	12	1	14	5	13	5	8	1	11	6	10	6	9	1
	21	6	15	5	17	7	16	5	19	6	18	3	20	4
	23	4	26	5	28	6	25	5	24	5	27	5	22	6
	30	3	35	5	33	3	34	5	32	6	29	3	31	6
Raw Scores		15		22		22		17		30		20		18
Percentile Scores		87		80		78		65		76		48		57

Survey 23	0		1		2		3		4		5		6	
	3	1	6	7	7	5	4	4	1	5	5	0	2	1
	12	2	14	7	13	5	8	5	11	4	10	6	9	4
	21	6	15	7	17	6	16	6	19	4	18	2	20	2
	23	2	26	6	28	7	25	4	24	5	27	7	22	4
	30	6	35	0	33	7	34	0	32	4	29	1	31	2
Raw Scores		17		27		30		19		22		16		13
Percentile Scores		94		93		94		73		38		31		34

Survey 24	0		1		2		3		4		5		6	
	3	3	6	6	7	7	4	7	1	5	5	3	2	2
	12	6	14	3	13	6	8	6	11	6	10	1	9	5
	21	7	15	5	17	6	16	6	19	3	18	3	20	3
	23	7	26	7	28	7	25	7	24	0	27	7	22	6
	30	7	35	6	33	7	34	7	32	7	29	7	31	7
Raw Scores		30		27		33		33		21		21		23
Percentile Scores		99		93		96		99		33		52		77

Survey 25	0		1		2		3		4		5		6	
	3	3	6	5	7	2	4	5	1	1	5	4	2	7
	12	4	14	4	13	4	8	3	11	3	10	5	9	5
	21	7	15	5	17	4	16	6	19	4	18	3	20	6
	23	7	26	7	28	6	25	7	24	1	27	3	22	2
	30	7	35	4	33	3	34	3	32	2	29	4	31	7
Raw Scores		28		25		19		24		11		19		27
Percentile Scores		99		90		70		88		8		44		90

Survey 26	0		1		2		3		4		5		6	
	3	2	6	1	7	1	4	1	1	2	5	6	2	2
	12	6	14	5	13	1	8	1	11	1	10	5	9	1
	21	6	15	7	17	6	16	1	19	5	18	5	20	2
	23	5	26	6	28	6	25	5	24	6	27	6	22	5
	30	6	35	5	33	1	34	1	32	1	29	6	31	2
Raw Scores		25		24		15		9		15		28		12
Percentile Scores		99		88		57		30		16		80		30

Survey 27	0		1		2		3		4		5		6	
	3	7	6	0	7	7	4	7	1	5	5	7	2	7
	12	0	14	7	13	7	8	4	11	7	10	7	9	4
	21	0	15	7	17	7	16	7	19	7	18	7	20	7
	23	0	26	7	28	7	25	7	24	7	27	7	22	7
	30	0	35	7	33	7	34	0	32	7	29	7	31	7
Raw Scores		7		28		35		25		33		35		32
Percentile Scores		31		95		99		90		90		98		98

Survey 28	0		1		2		3		4		5		6	
	3	5	6	4	7	4	4	4	1	2	5	1	2	5
	12	5	14	4	13	5	8	1	11	1	10	1	9	4
	21	5	15	4	17	4	16	4	19	5	18	1	20	0
	23	6	26	5	28	5	25	5	24	0	27	0	22	0
	30	5	35	7	33	4	34	5	32	0	29	5	31	0
Raw Scores	26		24		22		19		8		8		9	
Percentile Scores	99		88		78		73		5		10		20	

Survey 29	0		1		2		3		4		5		6	
	3	3	6	1	7	6	4	7	1	6	5	6	2	3
	12	0	14	7	13	6	8	2	11	1	10	6	9	1
	21	4	15	7	17	6	16	3	19	6	18	6	20	4
	23	2	26	7	28	3	25	1	24	6	27	2	22	5
	30	5	35	7	33	6	34	3	32	6	29	6	31	4
Raw Scores	14		29		27		16		25		26		17	
Percentile Scores	81		96		89		60		54		72		52	

Survey 30	0		1		2		3		4		5		6	
	3	1	6	2	7	1	4	6	1	1	5	4	2	6
	12	7	14	3	13	3	8	1	11	1	10	3	9	3
	21	6	15	6	17	6	16	4	19	6	18	4	20	1
	23	1	26	7	28	7	25	7	24	6	27	6	22	6
	30	5	35	1	33	6	34	4	32	5	29	7	31	6
Raw Scores	20		19		23		22		19		24		22	
Percentile Scores	98		69		80		83		27		64		73	

Survey 31	0		1		2		3		4		5		6	
	3	2	6	4	7	4	4	5	1	5	5	2	2	4
	12	2	14	3	13	3	8	5	11	6	10	6	9	6
	21	6	15	6	17	5	16	5	19	4	18	2	20	4
	23	6	26	6	28	6	25	6	24	6	27	6	22	7
	30	6	35	5	33	4	34	6	32	5	29	6	31	2
Raw Scores	22		24		22		27		26		22		23	
Percentile Scores	99		88		78		94		59		55		77	

Survey 32	0		1		2		3		4		5		6	
	3	1	6	2	7	5	4	7	1	1	5	4	2	3
	12	2	14	0	13	5	8	6	11	4	10	7	9	7
	21	7	15	0	17	7	16	7	19	6	18	4	20	1
	23	4	26	7	28	7	25	7	24	7	27	7	22	5
	30	7	35	6	33	6	34	7	32	5	29	7	31	1
Raw Scores	21		15		30		34		23		29		17	
Percentile Scores	99		57		94		99		43		84		52	

Survey 33	0		1		2		3		4		5		6	
	3	1	6	3	7	0	4	7	1	4	5	5	2	2
	12	7	14	5	13	0	8	7	11	4	10	6	9	7
	21	6	15	0	17	6	16	6	19	7	18	2	20	6
	23	3	26	7	28	5	25	6	24	7	27	7	22	4
	30	7	35	1	33	4	34	7	32	7	29	6	31	2
Raw Scores	24		16		15		33		29		26		21	
Percentile Scores	99		60		57		99		71		72		69	

Survey 34	0		1		2		3		4		5		6	
	3	1	6	2	7	0	4	4	1	5	5	6	2	1
	12	1	14	5	13	0	8	2	11	6	10	5	9	5
	21	1	15	5	17	4	16	4	19	5	18	2	20	0
	23	2	26	4	28	5	25	4	24	5	27	4	22	2
	30	2	35	5	33	4	34	2	32	4	29	4	31	4
Raw Scores		7		21		13		16		25		21		12
Percentile Scores		31		75		52		60		54		52		30

Survey 35	0		1		2		3		4		5		6	
	3	1	6	4	7	3	4	5	1	6	5	3	2	1
	12	5	14	6	13	5	8	4	11	6	10	7	9	4
	21	5	15	6	17	7	16	7	19	6	18	4	20	1
	23	5	26	5	28	5	25	5	24	6	27	7	22	4
	30	6	35	1	33	5	34	5	32	2	29	7	31	5
Raw Scores		22		22		25		26		26		28		15
Percentile Scores		99		80		85		92		59		80		42

Survey 36	0		1		2		3		4		5		6	
	3	0	6	4	7	5	4	2	1	5	5	4	2	1
	12	1	14	0	13	0	8	2	11	6	10	6	9	2
	21	6	15	5	17	6	16	1	19	5	18	5	20	0
	23	5	26	5	28	5	25	0	24	5	27	6	22	5
	30	4	35	6	33	5	34	3	32	6	29	5	31	0
Raw Scores		16		20		21		8		27		26		8
Percentile Scores		91		72		76		27		63		72		17

**APPENDIX L: STAGES OF CONCERN QUESTIONNAIRE RAW
SCORES FOR INDIVIDUAL SURVEYS**

Survey	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	14	26	27	20	23	26	19
2	10	8	15	7	15	27	12
3	19	21	23	21	27	23	17
4	23	24	29	19	20	25	22
5	13	28	35	13	35	35	28
6	17	16	20	20	17	10	10
7	26	21	31	31	20	14	14
8	15	9	7	4	16	29	7
9	23	13	22	7	13	8	11
10	20	22	18	23	25	23	23
11	14	22	20	16	19	19	14
12	28	26	20	31	17	22	26
13	21	8	15	17	13	19	24
14	12	30	24	28	25	19	23
15	23	24	25	22	19	22	16
16	21	0	0	4	7	12	5
17	18	24	30	30	27	26	26
18	25	5	17	19	11	11	9
19	16	18	18	9	6	20	11
20	19	22	22	28	25	26	18
21	21	15	15	14	16	14	14
22	15	22	22	17	30	20	18
23	17	27	30	19	22	16	13
24	30	27	33	33	21	21	23
25	28	25	19	24	11	19	27
26	25	24	15	9	15	28	12
27	7	28	35	25	33	35	32
28	26	24	22	19	8	8	9
29	14	29	27	16	25	26	17
30	20	19	23	22	19	24	22
31	22	24	22	27	26	22	23

Survey	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
32	21	15	30	34	23	29	17
33	24	16	15	33	29	26	21
34	7	21	13	16	25	21	12
35	22	22	25	26	26	28	15
36	16	20	21	8	27	26	8
Average	19.22	20.14	21.81	19.75	20.44	21.64	17.17
Percentile Scores Conversion	97	72	78	77	30	55	52

**APPENDIX M: STAGES OF CONCERN QUESTIONNAIRE
PERCENTILE SCORES FOR INDIVIDUAL SURVEYS**

Survey	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	81	91	89	77	43	72	60
2	55	37	57	23	16	76	30
3	97	75	80	80	63	59	52
4	99	88	92	73	30	68	73
5	75	95	99	47	96	98	92
6	94	60	72	77	21	14	22
7	99	75	95	98	30	25	38
8	87	40	31	11	19	84	14
9	99	51	78	23	11	10	26
10	98	80	67	85	54	59	77
11	81	80	72	60	27	44	38
12	99	91	72	98	21	55	87
13	99	37	57	65	11	44	81
14	69	97	83	95	54	44	77
15	99	88	85	83	27	55	47
16	99	5	5	11	4	19	9
17	96	88	94	97	63	72	87
18	99	27	63	73	8	16	20
19	91	66	67	30	3	48	26
20	97	80	78	95	54	72	57
21	99	57	57	52	19	25	38
22	87	80	78	65	76	48	57
23	94	93	94	73	38	31	34
24	99	93	96	99	33	52	77
25	99	90	70	88	8	44	90
26	99	88	57	30	16	80	30
27	31	95	99	90	90	98	98
28	99	88	78	73	5	10	20

Survey	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
29	81	96	89	60	54	72	52
30	98	69	80	83	27	64	73
31	99	88	78	94	59	55	77
32	99	57	94	99	43	84	52
33	99	60	57	99	71	72	69
34	31	75	52	60	54	52	30
35	99	80	85	92	59	80	42
36	91	72	76	27	63	72	17

Note. The gray boxes indicate the stage with the highest intensity of concern for each individual. If more than one box is grayed for an individual, it signifies that either two or more stages had the same percentile or there were percentiles within one or two points of the highest score for the same individual.

**APPENDIX N: SUMMARY OF RESPONSES TO QUESTIONNAIRE
ITEMS (ARRANGED BY CORRESPONDING STAGES)**

Stage 0 (Unconcerned)

Item 3	“I am more concerned about another innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =3	<i>n</i> =15	<i>n</i> =3	<i>n</i> =5	<i>n</i> =2	<i>n</i> =3	<i>n</i> =3	<i>n</i> =2
Item 12	“I am not concerned about the innovation at this time.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =3	<i>n</i> =9	<i>n</i> =6	<i>n</i> =2	<i>n</i> =2	<i>n</i> =6	<i>n</i> =2	<i>n</i> =6
Item 21	“I am preoccupied with things other than the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =1	<i>n</i> =3	<i>n</i> =0	<i>n</i> =3	<i>n</i> =6	<i>n</i> =6	<i>n</i> =10	<i>n</i> =7
Item 23	“I spend little time thinking about the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =2	<i>n</i> =2	<i>n</i> =6	<i>n</i> =5	<i>n</i> =5	<i>n</i> =5	<i>n</i> =6	<i>n</i> =5
Item 30	“Currently, other priorities prevent me from focusing my attention on the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =2	<i>n</i> =4	<i>n</i> =3	<i>n</i> =1	<i>n</i> =4	<i>n</i> =7	<i>n</i> =7	<i>n</i> =8

Stage 1 (Informational)

Item 6	“I have a very limited knowledge of the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=4</i>	<i>n=6</i>	<i>n=9</i>	<i>n=4</i>	<i>n=8</i>	<i>n=2</i>	<i>n=2</i>	<i>n=1</i>
Item 14	“I would like to discuss the possibility of using the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=4</i>	<i>n=4</i>	<i>n=4</i>	<i>n=4</i>	<i>n=5</i>	<i>n=8</i>	<i>n=3</i>	<i>n=4</i>
Item 15	“I would like to know what resources are available if we decide to adopt the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=5</i>	<i>n=2</i>	<i>n=0</i>	<i>n=3</i>	<i>n=3</i>	<i>n=7</i>	<i>n=9</i>	<i>n=7</i>
Item 26	“I would like to know what the use of the innovation will require in the immediate future.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=2</i>	<i>n=1</i>	<i>n=1</i>	<i>n=2</i>	<i>n=3</i>	<i>n=10</i>	<i>n=6</i>	<i>n=11</i>
Item 35	“I would like to know how the innovation is better than what we have now.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=4</i>	<i>n=6</i>	<i>n=0</i>	<i>n=1</i>	<i>n=1</i>	<i>n=10</i>	<i>n=8</i>	<i>n=6</i>

Stage 2 (Personal)

Item 7	“I would like to know the effect of reorganization on my professional status.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =6	<i>n</i> =6	<i>n</i> =2	<i>n</i> =4	<i>n</i> =4	<i>n</i> =6	<i>n</i> =5	<i>n</i> =3
Item 13	“I would like to know who will make the decisions in the new system.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =4	<i>n</i> =4	<i>n</i> =1	<i>n</i> =3	<i>n</i> =2	<i>n</i> =9	<i>n</i> =8	<i>n</i> =5
Item 17	“I would like to know how my teaching or administration is supposed to change.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =1	<i>n</i> =0	<i>n</i> =1	<i>n</i> =1	<i>n</i> =10	<i>n</i> =5	<i>n</i> =10	<i>n</i> =8
Item 28	“I would like to have more information on time and energy commitments required by the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =2	<i>n</i> =3	<i>n</i> =1	<i>n</i> =2	<i>n</i> =5	<i>n</i> =7	<i>n</i> =10	<i>n</i> =6
Item 33	“I would like to know how my role will change when I am using the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n</i> =1	<i>n</i> =4	<i>n</i> =0	<i>n</i> =5	<i>n</i> =7	<i>n</i> =5	<i>n</i> =9	<i>n</i> =5

Stage 3 (Management)

Item 4	“I am concerned about not having enough time to organize myself each day.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=0</i>	<i>n=3</i>	<i>n=2</i>	<i>n=5</i>	<i>n=6</i>	<i>n=4</i>	<i>n=7</i>	<i>n=9</i>
Item 8	“I am concerned about conflict between my interests and my responsibilities.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=4</i>	<i>n=7</i>	<i>n=7</i>	<i>n=4</i>	<i>n=7</i>	<i>n=3</i>	<i>n=3</i>	<i>n=1</i>
Item 16	“I am concerned about my inability to manage all that the innovation requires.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=3</i>	<i>n=6</i>	<i>n=1</i>	<i>n=3</i>	<i>n=7</i>	<i>n=4</i>	<i>n=6</i>	<i>n=6</i>
Item 25	“I am concerned about time spent working with nonacademic problems related to the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=4</i>	<i>n=1</i>	<i>n=4</i>	<i>n=4</i>	<i>n=9</i>	<i>n=5</i>	<i>n=8</i>
Item 34	“Coordination of tasks and people is taking too much of my time.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=6</i>	<i>n=3</i>	<i>n=3</i>	<i>n=3</i>	<i>n=4</i>	<i>n=6</i>	<i>n=6</i>	<i>n=5</i>

Stage 4 (Consequence)

Item 1	“I am concerned about students’ attitudes toward the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=2</i>	<i>n=9</i>	<i>n=3</i>	<i>n=3</i>	<i>n=4</i>	<i>n=10</i>	<i>n=3</i>	<i>n=2</i>
Item 11	“I am concerned about how the innovation affects students.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=2</i>	<i>n=7</i>	<i>n=1</i>	<i>n=4</i>	<i>n=5</i>	<i>n=4</i>	<i>n=10</i>	<i>n=3</i>
Item 19	“I am concerned about evaluating my impact on students.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=3</i>	<i>n=4</i>	<i>n=3</i>	<i>n=5</i>	<i>n=6</i>	<i>n=9</i>	<i>n=5</i>
Item 24	“I would like to excite my students about their part in this approach.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=3</i>	<i>n=4</i>	<i>n=0</i>	<i>n=6</i>	<i>n=2</i>	<i>n=6</i>	<i>n=9</i>	<i>n=6</i>
Item 32	“I would like to use feedback from students to change the program.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=2</i>	<i>n=3</i>	<i>n=3</i>	<i>n=2</i>	<i>n=5</i>	<i>n=9</i>	<i>n=7</i>	<i>n=5</i>

Stage 5 (Collaboration)

Item 5	“I would like to help other faculty in their use of the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=3</i>	<i>n=7</i>	<i>n=6</i>	<i>n=6</i>	<i>n=5</i>	<i>n=5</i>	<i>n=3</i>
Item 10	“I would like to develop working relationships with both our faculty and outside faculty using this innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=2</i>	<i>n=3</i>	<i>n=2</i>	<i>n=6</i>	<i>n=3</i>	<i>n=9</i>	<i>n=7</i>	<i>n=4</i>
Item 18	“I would like to familiarize other departments or persons with the progress of this new approach.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=2</i>	<i>n=5</i>	<i>n=5</i>	<i>n=8</i>	<i>n=7</i>	<i>n=3</i>	<i>n=4</i>	<i>n=2</i>
Item 27	“I would like to coordinate my efforts with others to maximize the innovation’s effects.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=1</i>	<i>n=2</i>	<i>n=5</i>	<i>n=2</i>	<i>n=6</i>	<i>n=11</i>	<i>n=8</i>
Item 29	“I would like to know what other faculty are doing in this area.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=0</i>	<i>n=2</i>	<i>n=0</i>	<i>n=4</i>	<i>n=4</i>	<i>n=5</i>	<i>n=10</i>	<i>n=11</i>

Stage 6 (Refocusing)

Item 2	“I now know of some other approaches that might work better.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=11</i>	<i>n=4</i>	<i>n=8</i>	<i>n=2</i>	<i>n=4</i>	<i>n=3</i>	<i>n=3</i>
Item 9	“I am concerned about revising my use of the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=4</i>	<i>n=5</i>	<i>n=3</i>	<i>n=6</i>	<i>n=5</i>	<i>n=6</i>	<i>n=4</i>	<i>n=3</i>
Item 20	“I would like to revise the innovation’s approach.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=5</i>	<i>n=10</i>	<i>n=4</i>	<i>n=5</i>	<i>n=5</i>	<i>n=2</i>	<i>n=3</i>	<i>n=2</i>
Item 22	“I would like to modify our use of the innovation based on the experiences of our students.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=1</i>	<i>n=4</i>	<i>n=5</i>	<i>n=4</i>	<i>n=3</i>	<i>n=6</i>	<i>n=8</i>	<i>n=5</i>
Item 31	“I would like to determine how to supplement, enhance, or replace the innovation.”							
	Irrelevant	Not true of me now		Somewhat true of me now			Very true of me now	
	0	1	2	3	4	5	6	7
	<i>n=3</i>	<i>n=4</i>	<i>n=5</i>	<i>n=5</i>	<i>n=3</i>	<i>n=4</i>	<i>n=7</i>	<i>n=5</i>

**APPENDIX O: AGREEMENT FOR PERMISSION TO REPUBLISH –
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AGREEMENT FOR PERMISSION TO REPUBLISH — PRINT & ELECTRONIC

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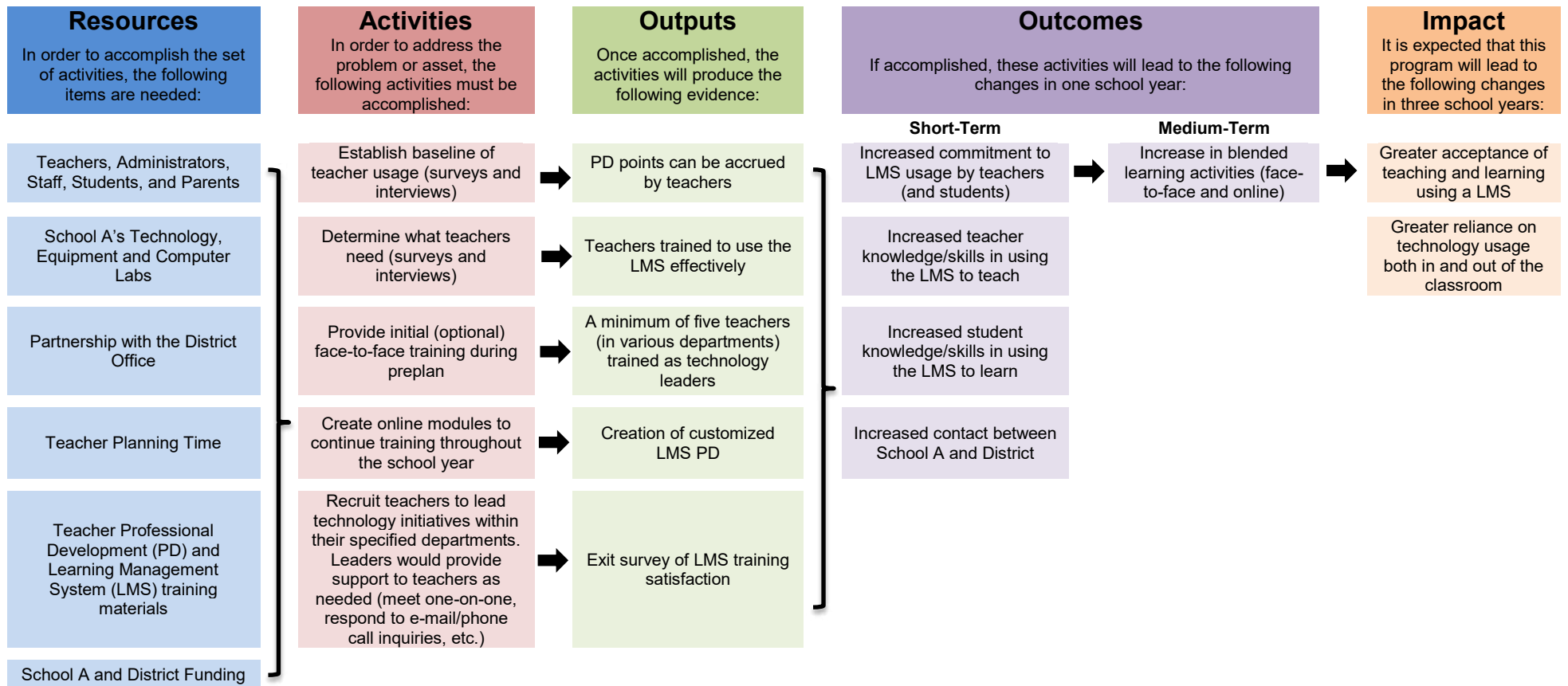
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**APPENDIX P: V. FRANZESE'S LOGIC MODEL FOR LMS
EVALUATION**



V. Franzese's Logic Model for LMS Evaluation. Created using Fitzpatrick et al. (2010).

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