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ACCEPTING TECHNOLOGY AND OVERCOMING RESISTANCE TO CHANGE
USING THE MOTIVATION AND ACCEPTANCE MODEL

by

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ABSTRACT

This research analyzed why some university faculty resisted a new software program using a new model of motivation. The new model, called the motivation and acceptance model (MAM), was inspired by the technology acceptance model and the commitment and necessary effort model of motivation. This model was tested on faculty at a college in a large southeastern university who were resisting a new software program called LiveText. This research used regression analysis to determine the relationship between the variables of the MAM: perceived usefulness, perceived organizational support, perceived ease of use, and attitude toward LiveText. The research was conducted during the Spring 2007 semester. The data were analyzed with regression, independent-sample t-tests, and descriptive statistics using SPSS v15. This research demonstrates that the MAM accurately measured the relationship between professors' perceptions and their use of LiveText. The research also suggests that the perceived utility of LiveText and users' attitudes toward LiveText were statistically significant predictors of LiveText use and that perceived ease of use also predicted whether the professors found LiveText useful. Additional research should seek to develop a greater understanding of technology acceptance and employee resistance to innovations using larger sample sizes, a variety of environments and organizations, diverse populations, and different types of technologies and technology-implementation strategies.

To my father, Donald T. Siegel.

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CHAPTER ONE: INTRODUCTION

This dissertation is designed to test a new model intended to help analyze why employees resist using a new software program. It looks at two previous intervention models and concludes that when used alone, neither previous model addresses the resistance problem. The author created a blended approach model that will address the reasons behind resistance to the new software implementation by measuring employee motivation and acceptance of new technology. The new model is called the motivation and acceptance model (MAM) and is inspired by the technology acceptance model (TAM) developed by Davis (1985) and the commitment and necessary effort (CANE) model developed by Clark (1998b). In this study, the MAM was applied to measure employee motivation and technology resistance to an online assessment-management software package called LiveText in use at a college in a large southeastern university. LiveText is a multipurpose program used to track student progress. Some professors at the college have been resistant to accepting this new technology. They also have experienced low motivation toward training and using this software in their daily activities. It is hoped that the research in this report will help bridge the gap between current business and academic environments and available human-performance technologies by locating causes of low motivation and resistance.

Problem Statement

Employee resistance and low motivation to use new technology is a problem that continues to trouble business and educational organizations throughout the world. The TAM was designed to be expanded with additional behavior constructs to develop further understanding of technology acceptance. In this dissertation, the MAM was applied to the college at a large southeastern university where a new technology had been introduced called LiveText. Employees may embrace or resist technology directly or passively (see chapter 2, the literature review for further discussion; Petrini & Hultman, 1995). While many employees embraced LiveText, many actively and passively resisted its implementation. The level of acceptance and resistance and the causes of resistance had to be determined to locate solutions to overcome resistance and encourage the successful implementation of LiveText. This research was designed to narrow the gap between current organizational environments and available human-performance technologies.

Hypotheses

The research question for this study is "What are the relationships between the components of the MAM?" as applied to its usefulness in getting faculty to use LiveText? From this research question, one can derive the following hypotheses (see Figure 1).

H_1: An increase in positive attitude toward, perceived usefulness, perceived ease of use, and perception of organizational support toward LiveText will result in a statistically significant increase in the use of LiveText.

H_2: An increase in perceived ease of use and perception of organizational support toward using LiveText will result in a statistically significant increase in a positive attitude toward LiveText.

H₃: An increase in perceived ease of use and perceived organizational support of LiveText will result in a statistically significant increase in the perceived usefulness of LiveText.
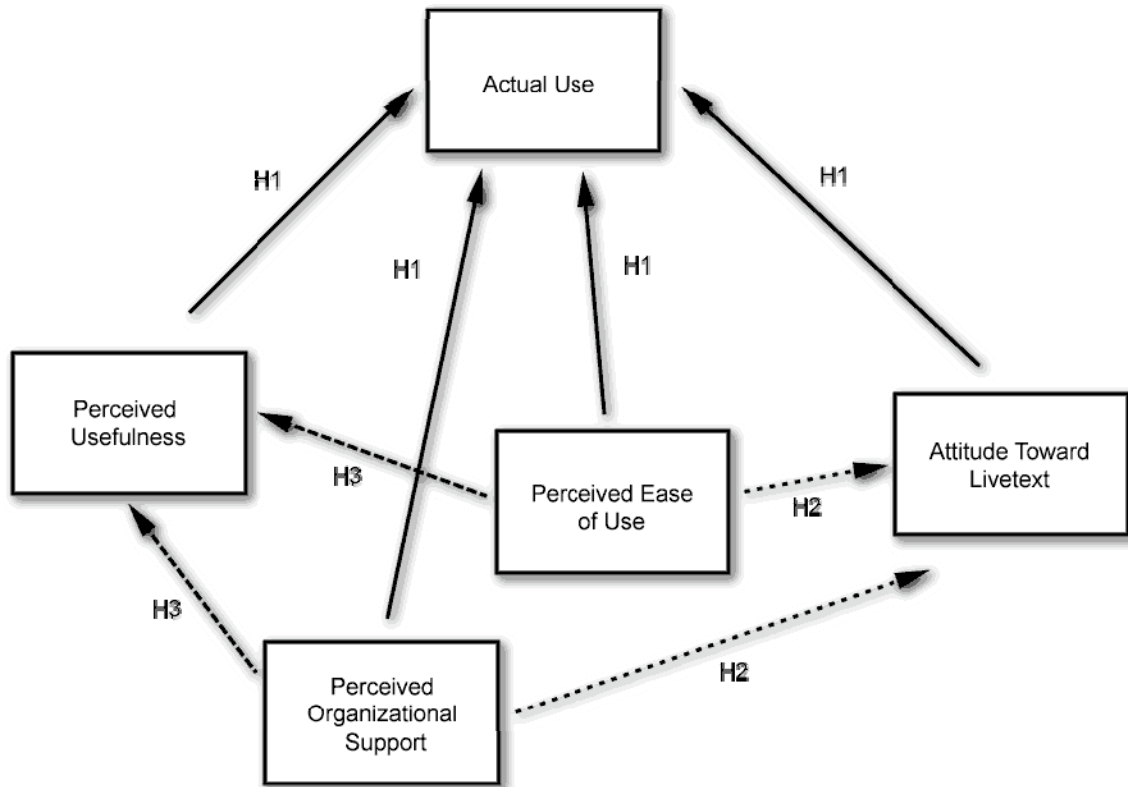
Figure 1: The MAM expands the TAM to incorporate elements of motivational theory.

Definitions

Commitment and Necessary Effort (CANE) model of motivation: Model designed to explain the motivation of goal choice and commitment based on motivation and effort (Clark, 1998b).

Motivation: Goal-directed behavior and persistence in the face of obstacles (Clark, 1998b).

Motivation and Acceptance Model (MAM): A hybrid model designed to measure motivation and technology acceptance inspired by the TAM and the CANE model of motivation.

Online Assessment Management System: Technological system designed to manage educational standards, align course materials and student assignments, create and share electronic portfolios and measure student assessment electronically.

Resistance: The primary drive to keep things the same over time (O'Neill, 2001).

Technology: The application of science in industrial or commercial objectives (O'Neill, 2001).

Technology Acceptance Model (TAM): A model that describes user determinants for technological acceptance based on perceived usefulness and perceived ease of use in deciding whether or not they will use the technology (Davis, 1985).

Significance

There have been many contributions to the study of motivation in education. Motivational issues have been a cause of many challenges for business and academic environments. Low motivation and resistance to technology is a growing problem in academic and business settings throughout the world. Employees continue to struggle with new technology because technologies in education and business are continually changing and there is increased pressure on employees to develop their skills for organizations to stay competitive. Research of Fortune 1,000 companies has revealed a high failure rate for implementing software applications and a survey of Fortune 500 executives found that the primary reason for failure is resistance (Maurer, 1997). Research conducted by Sevier (2003) at Macalester College highlighted the need to

overcome organizational resistance in academia as well. Motivational measurements and

strategies were used to create a sense of urgency that would overcome internal resistance

in the organization (p. 23). The landmark work of Gagne (1985) identified the mental

conditions for learning using informational processing models and identified these mental

states in the following nine steps:

1. Gain attention: Stimulate learner receptors

2. Inform learners of objectives: Create a level of expectation for learning

3. Stimulate recall of prior learning: Retrieve and activate short-term memory

4. Present the content: Selective perception of content

5. Provide learning guidance: Proper encoding of long-term memory

6. Elicit performance (practice): Respond to questions to enhance coding

7. Give feedback: Reinforce and assess performance

8. Assess performance: Retrieval and reinforcement as final evaluation

9. Enhancement and transference: Retrieve and use general skills in the new job

   situation.

   Keller (1987a, 1987b) was another founder in motivational theory by contributing

the Attention, Relevance, Confidence, Satisfaction (ARCS) model. The ARCS model is

similar to the MAM in that it is based on motivational concepts and an approach to

human-performance challenges that focus on the context rather than imposing

motivational solutions without research. The ARCS model focuses on the following

components:

1. Attention: One must gain learner attention through a variety of tactics such as

arousing curiosity and individual interest.

2. Relevance: One must relate the delivery of information to the learner's goals, learning styles, and past experiences.

3. Confidence: One must establish positive learner expectations for success under the conditions where the learner's attributes can overcome obstacles and retain information. The learner must also attribute success to their individual skills and abilities.

4. Satisfaction: The learner must experience positive feelings about their learning experience from compatible extrinsic and intrinsic rewards and recognitions.

This study is designed to further the understanding of employee resistance to new technology in the workplace. The author is studying workplace resistance to technology in a specific location to expand the literature and understanding on how motivation and technology acceptance by employees can be improved; to understand how to help organizations grow and succeed.

Assumptions

The study assumed that all of the respondents understand the survey questions and answer honestly and to the best of their ability. This study also assumed that the questions asked are reliable and valid. Finally, it is assumed that the responses reflect the broader population of employees at the college in a large southeastern university.

Limitations and Delimitations

The research was limited to the faculty of the college in a large southeastern university who are scheduled to use LiveText. This study was an isolated observation of

the opinions of the participants and researchers one particular college at a single

university with a specific population using one type of software.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This review of literature touches on four major areas: (a) Resistance to

technology, (b) the TAM and its components, (c) the CANE model of motivation and its

components, and (d) the elements of an expanded TAM–CANE model and how

motivation relates to technology acceptance. This chapter begins with a review of

resistance to technology, explaining resistance and why it is a problem for business and

academic organizations. The second section discusses the TAM and describes its

purpose, history, utility, and limitations. The third section explores the need to expand the

TAM using a motivational model and discusses the CANE model of motivation. This

section describes the purpose, history, utility, and limitations of the CANE model.

Finally, the fourth section discusses the MAM hybrid of the TAM and CANE models and

how it can be used as a measure to locate reasons why employees resist new technology.

The MAM is designed to locate the root causes of resistance. This report is not intended

to solve the problem of resistance by faculty, but to identify where initiatives should be

focused to alleviate resistance at a college in a large southeastern university.

Resistance to Technology

Resistance is a key obstacle facing trainers and instructional designers throughout

the corporate world (West, 1994). Resistance is a term used by many trainers to describe

the unwillingness of employees to embrace a particular idea, concept, curriculum,

technology, or coursework (Dent, 1995). The term *resistance to technology* must be defined and contextualized to analyze the effect it has on the workplace. Management should understand the nature of a resistant individual to understand resistant behavior and to find solutions. Resistance is defined as "the action of opposing something that you disapprove or disagree with" and "the ability to resist; esp: the inherent capacity of a living being to resist untoward circumstances" (Mish, 2003, p. 1003). Therefore, resistance can be defined as the propensity "to remain unaffected or undamaged by something" (O'Neill, 2001, p. 1050). Training is defined as a way to "prepare oneself or prepare them for performance by instruction, practice, and exercise" (O'Neill, p. 1291). Another definition of training is "to form by instruction, discipline, or drill; to teach so as to make fit, qualified, or proficient" (Mish, p. 1251). Resistance must be addressed when seeking a solution to employee resistance to technology. Proper training initiatives focused on appropriate areas of resistance can encourage faculty to embrace changes. Successful organizations locate root causes of resistance by listening to employees through research endeavors and other methods such as interviews and surveys. This research must be the basis for building training initiatives designed to support employees in overcoming the true causes of resistance.

Resistance is a term that can be found throughout business literature in fields such as management, organizational psychology, and organizational behavior (Dent, 1999). Business literature also states that there is an elementary force that encourages employees to maintain consistency in their actions and behaviors to encourage unchanged persistence in the culture and business processes (Steinburg, 1992). The efforts of training are continually challenged by the need to diminish and overcome resistance.

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Because trainers are one of the key agents in implementing change in an organization, resistance to any aspect of training can impact an organization's attempt to alter the way it does business because resistant learners make training programs ineffective (Kotter, 1995).

Resistance is widespread. Many consultants who have instituted corporate structural change have experienced resistance in a variety of ways (Steinburg, 1992). In today's rapidly changing business environment, a company's ability to adapt is the main factor in its survival and competitive success (West, 1994). Learning the root causes of resistance and the different perceptions that management and employees have toward training may provide statistically significant support to training departments and companies undergoing change management and organizational restructuring initiatives (Steinburg).

The challenge in researching the concept of resistance is finding the cause of the resistance in the organization (Sevier, 2003). Understanding root causes of training resistance will allow for the development of well-planned solutions to improve the implementation of training (Kirkpatrick, 1993). For example, if employees are resistant as a result of their perceptions of an uncaring management, then a solution can be implemented to allow change to take place. Compared to the last century of formal organizational training, resistance has only recently been examined critically (McLagan, 1989). The nature of this problem and why it occurs both deserve continued study because of the great impact of resistance on corporations. Likewise, academic research must analyze factors related to training management and process implementation because the failure rate of these programs is high (Kotter, 1995).

Research may be needed in specific instances and in current business environments using human-performance technologies to remedy this ubiquitous challenge, as demonstrated by the research of Morrow, Jarrett, and Rupinsky (1997) on corporate-wide training evaluation. The research of Morrow et al., who studied 11 corporate training initiatives, showed that many are costly and ineffective.

There is clear evidence that investment in employee performance is profitable for corporations. These benefits are often miscalculated because the wrong performance programs are chosen (Clark & Estes, 2002). The benefits of human-performance technology initiatives are less often recognized because management chooses the wrong program or the program is executed poorly. Training initiatives can counter negative results. Employees can be motivated to use a new program by engaging in well-constructed training programs with motivational, positive, and informed instructors. Entertaining and interactive electronic learning and simulators can also encourage positive attitudes and inspire workers. A case study by Clark and Estes described the sales department at Crain Properties, delineating the implementation of a new sales training initiative. The report showed that although sales at the company were very low, employees still resisted the implementation of the new sales program (p. 8). Most reports on resistance to training focus on spontaneous solutions rather than searching for the underlying cause of the resistance problem. Clark (1989) outlined that poorly designed or delivered training can make people perform more poorly after training than before. He attributes one cause of this to training changing the learners perceptions of work related topics. This poor training led to a situation where people were more confused than when they began training (Clark & Estes).

The effects of resistance on an organization are widespread. The inability to adapt to changing climates, technologies, and globalization may lead to loss in profit and productivity. Bennis (1969) said that organizational development requires an organization to adapt and be flexible. He also stated that organizational developments require an educational strategy that is intended to change the beliefs, attitudes, values, and structures of the company so that employees can adapt to new technologies and process changes in a more efficient way. The effect of resistance on the implementation of LiveText is a central theme in this study.

There are many manifestations of resistance, both active and passive. Active resistance includes direct verbal discontent against the program from employees toward management and the training department. Passive resistance includes engaging in private, negative conversations with other employees, avoiding training classes, and avoiding the use of the technology and procedures. These forms of resistance are not unusual when implementing new processes and technologies in an unreceptive environment. Passive resistance may be a direct result of low motivation (Petrini & Hultman, 1995). This research is intended to find the relationship between resistance, motivation, and use of a new technology.

Perspectives on LiveText should be measured using a model that combines motivation with the acceptance of technology on an organizational level. Because there are few successful models that specifically address issues of technology acceptance and motivation on an organizational level, a solution would be to form a new hybrid model inspired by the TAM and the CANE model. The formation of a hybrid model is well supported by the literature because the TAM was built upon the premise that new

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constructs can be added. Motivation is a construct that must be addressed when considering whether or not a person will perform a particular action or undertake a new task. Based on the literature review and the desire of this author to understand the facets of technology acceptance and motivation, the hybrid model was constructed.

The Technology Acceptance Model

Van der Heijden (2003) described the TAM as "a parsimonious, theoretically and empirically justified model intended to explain the acceptance of information systems" (p. 541). TAM is a popular model for explaining the behavior of technology users (van der Heijden, 2003). The TAM has been empirically demonstrated to have high validity in many research contexts (Chau, 1996). The TAM deals directly with issues regarding the implementation of new technology. A strength of the TAM is that it is simple and easy to apply to many situations. The TAM is designed to explain technology acceptance on an individual level in wide user populations and to explain the contexts with which technology is used. It does not detail the impact of motivation on technology acceptance (Hu, Clark, & Ma, 2003). This report is designed to better understand the relationship between employee motivation, technology acceptance, and the use of the new technology, and as a side effect to recommend possible solutions that address the problem of faculty resistance to using LiveText.

Researchers have attempted to expand their understanding of the impact of behavior constructs on technology acceptance (Riemenschneider, Harrison, & Mykytyn, 2003). Moon and Kim (2001) extended the model to include perceived playfulness as an antecedent of attitude toward Web surfing. J. Lee, Cho, Gay, and Davidson (2005) researched an extended TAM to include performance expectation, social expectation, and

satisfaction. Researchers have also integrated models to further study a unified theory of technology acceptance (Venkatesh, Morris, Davis, & Davis, 2003). Researchers found that individual acceptance of technology is affected by multiple factors including the technology, the user, and agency (Chau & Hu, 2002; Dishaw & Strong, 1999). Hans van der Heijden (2004) augmented the TAM to include perceived entertainment value and perceived attractiveness when measuring the use of Web technology. Stoel and Lee (2003) added the category of prior experience to the TAM. Zhang and Galletta (2006) elaborated the need for extensions to modern models with moderating factors for wider and more inclusive studies. Karahanna (1999), Pan (2003), and Lee, Cheung, and Chen (2005) all used behavior constructs to expand the TAM in their research. Karahanna also included social presence, social influence, physical accessibility, and support in the TAM while Pan expanded the TAM model to include computer self-efficacy and subjective norms to measure student usage of an online management program called WebCT. M. K. O. Lee et al. (2005) included a construct called perceived enjoyment to measure intrinsic motivational value. The influence of an expanded TAM, using new behavioral constructs and combining TAM with established models, has been empirically confirmed (Chin & Marcolin, 2001; Chin, Marcolin, & Newsted, 2003; Chin & Todd, 1995). Venkatesh et al. (2003) compared the explanatory power between models, with or without extensions, and found that the explanatory power of the TAM increased as extensions were added to it.

The TAM originated in the study of psychology and has been used in the study of information systems. The TAM was developed to establish a theoretical explanation of why users choose to accept or reject technology (Davis, 1986). The TAM describes

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technological acceptance or actual use by using the distinct constructs of *perceived ease of use* and *perceived usefulness* (Davis, 1993):

1. Actual use: The individual's behavior regarding the new system (Davis, Bagozzi, & Warshaw, 1989).

2. Perceived ease of use: the degree to which the individual believes that using the system would require little or no mental and physical effort (Davis, 1993, p. 477).

3. Perceived usefulness: the degree to which an individual believes the use of a system could enhance job performance (Davis, 1993, p. 477).

The theoretical origin of the TAM is Fishbein and Ajzen's (1975) theory of reasoned action, which is rooted in the study of social psychology. It focuses on the determinants of consciously intended behaviors (Ajzen & Fishbein, 1980; Fishbein & Ajzen). The theory states that personal performance is determined by intention synchronized with attitude and subjective norm. By using the theory of reasoned action as a theoretical foundation, Davis (1985) created the TAM to focus on the domain of user acceptance of technology by replacing the attitudinal components of the theory with perceived ease of use and perceived usefulness.

Perceived ease of use is theoretically based on the research of Albert Bandura (1982) who defined self-efficacy as "judgments of how well one can execute courses of action" (p. 122). In other words, self-efficacy is the belief in one's own ability to overcome the perceived difficulty of a task. The self-efficacious person sees a link between their own efforts and a successful outcome. Additionally, there are

circumstances where one must also have learned the specific procedures to achieve a successful outcome.

Perceived usefulness is another major determinant in the adoption of technology. It is the tendency of users to believe that the new technology will help them perform their job better (Davis, 1989). The construct of perceived usefulness in informational systems was indicated by the earlier work of Shultz and Slevin (1975) and Robey (1979). Shultz and Slevin's work points toward a "performance" construct. Robey found a correlation between performance and an undefined construct similar to perceived usefulness and asserted, the business process must support people in their jobs or it will not be successfully implemented. In a study using the TAM, Sun and Zhang (2006) used 71 out of 72 studies to indicate the effects of perceived usefulness as a statistically significant influence on attitude, behavioral intention, or usage. They determined that perceived usefulness is an important, if not the most important, factor that influences user acceptance of technology. Davis (1989) emphasized

> within organizational settings, people form intentions toward behaviors they
> believe will increase their job performance. … This is because enhanced
> performance is instrumental to achieving various rewards that are extrinsic to the
> content of the work itself, such as pay increases and promotions (p. 986).

Workplace settings focus on productivity rather the assessment of an individual's performance outcomes and technological perceptions.

TAM is a useful model because it allows researchers to locate the causes of technology resistance by focusing on behavioral constructs. Surveys can be used to gather information on the perceived ease of use and perceived usefulness for end users.

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For this reason, the TAM is considered by many to be the simplest, easiest, and most powerful measure of technology usage (Igbaria, Guimaraes, & Davis, 1995).

Although research indicates strong validity in the TAM (Chau, 1996), some critics believe it is too simple and has a limited number of constructs to describe behaviors. Mathieson (1991) pointed out that the TAM does not provide detailed information, but general opinions about the users and the system. Goodhue (1995) criticized the general nature of the TAM because of all the possible extensions to the model. Goodhue argued that a model with so many extensions would not be applicable to a single general theory for user evaluations. These criticisms suggest a need to expand the TAM in new ways. Motivation has a strong relationship to goal achievement and the decision to learn and use a new program. Therefore, the author proposes to extend the TAM using a motivational construct inspired by the CANE model of motivation. In the next section, the CANE model will be discussed as an inspiration to expand the TAM to include motivation as an important aspect of new technology acceptance.

Acceptance of Educational Technology

Extensive literature details the research on application of the TAM in educational technology acceptance. Sivo and Pan (2005) developed an academic TAM that illustrated the ability of subjective norms to guide perceived ease of use and perceived usefulness of a course-management system known as WebCT. The subjective norms then promoted an attitude that determined system use and ultimately determined an end-of-course grade. The Sivo and Pan study was based on earlier research conducted by Pan (2003), which successfully replicated the application of the TAM through the identification of causal relationships existing among student perceived ease of use, perceived usefulness, and

attitude towards WebCT. The academic TAM was successfully tested on engineering and

psychology students and stressed the importance of subjective norms. Pan demonstrated

that subjective norms had a greater impact on engineering students than psychology

students. The interventions necessary to improve student satisfaction vary by department

because students are impacted by different subjective norms.

Pan, Gunter, Sivo, and Cornell (2005) furthered their research into the application

of the academic TAM by including questions about gender, work status (part-time vs.

full-time students), timeliness (turning in homework on time vs. not turning in homework

on time) and course type (psychology vs. engineering). They used structural equation

modeling to measure four latent factors: perceived ease of use, perceived usefulness,

attitude toward WebCT, and actual use of WebCT. They also identified two outside latent

variables: computer self-efficacy and subjective norms. Their research uncovered that the

students' perceptions of the software's ease of use influenced their attitude toward

software instruction. Positive attitudes led to increased use and students who felt that the

software was easy to use and useful toward the completion of their coursework had a

more favorable view of the software. The researchers stressed the importance and need of

adding external variables such as computer self-efficacy to future research.

The research of Gong, Xu, and Yu (2004) studied resistance to educational

technology using the TAM by measuring teachers' technology acceptance using an

expanded TAM that included computer self-efficacy as a behavioral construct. This

research stated that educators are unique because as a sample they are relatively

independent and autonomous in their daily activities. This uniqueness also extends to

their technology choice and use. Public schools differ from many other environments

because there is less competition for resources and promotions. The research indicated that self-efficacy showed strong direct effect on both perceived ease of use and intention to use, as well as a strong relationship between computer self-efficacy on intention and enhanced users' perceived ease of use among educators (Gong et al.). This is very relevant to the current study because of the similarity in sample choice.

Smith (2006) used a modified version of the TAM to investigate the relationship between teachers' acceptance of an online teacher professional-development course and their continuance intentions regarding online development. This study focused on the perceptions of teachers and extended the TAM to include social presence and sociability. Smith found significant evidence indicating that social presence and sociability affect the TAM, and his research concluded that social presence and sociability impact the users' perceived ease of use. The researcher indicated that the exclusion of continuance in the TAM is a major shortcoming. Another example of continuance is the work of Naidoo and Leonard (2007) in South Africa on e-learning and continuance. This research expanded the TAM to include the variables of service quality and loyalty incentives and found that perceived usefulness is the dominating predictor of continuance. Service quality evaluations also provided strong evidence as a predictor of continuance and loyalty incentives offering little influence on continuance.

The TAM focuses on the initial adoption phase of a new technology but fails to account for the long-term use of recently implemented technology. The concept of continuance is critical because technology acceptance research often focuses on the initial adoption of technology and overlooks or ignores long-term use and the integration of a

new software into the daily activities of employees. Research must include more longitudinal studies to ensure that new technologies actually have been accepted.

In a study by Yang (2007), the TAM was extended to include subjective norms, computer self efficacy, sociability, and social presence, all found to be influencing factors to technology acceptance for students enrolled in a business-marketing course. Sociability and social presence are important software components when testing the viability of online learning because there are inherent human needs that must be addressed before constructing a successful online course.

McCloskey (2006) researched elderly consumers using an expanded TAM to examine how age would impact technology acceptance. The model was expanded to include trust as a variable. This type of research is useful because elderly end users stand to benefit tremendously from the use of technology and online resources. There is a popular and unfounded belief that many senior citizens are more resistant to learning technology than other populations. The results of this report were that age did not have a significant impact on any of the factors in the TAM.

Further research and development of technology acceptance must include a longitudinal analysis of the probability for continued use of new technology. Hsu and Chiu (2004) used the theory of planned behavior to analyze continuance in tax-filing software. The result of this research was that continuance could be predicted when including other variables. Roca, Chiu, and Martinez (2006) used an extended TAM to measure continuance with regard to e-learning. These researchers questioned the definition of acceptance by extending the amount of time measured during research beyond the initial phase of technology acceptance.

Another research factor considered is the environment in which the research takes place. The TAM has different outcomes in environments where technology implementation has been considered either mandatory or voluntary. Environments where end users are compelled to use a new technology are more likely to accept it than those in environments where technology use is considered voluntary. This brings into question the need for environmental variables such as organizational support or organizational structure. The model lacks effectiveness in more draconian technology environments. Unused, newly implemented technologies lead to a loss of limited financial resources for many organizations. If the technology that is being implemented is a compulsory requirement of the organization, then it is considered mandatory (Delone & McLean, 1992). If the technology is merely recommended and the end user has a willful choice to use it without repercussions, then the technology is considered voluntary (Agarwal & Prasad, 1997; Venkatesh & Davis, 2000). Y. Lee (2006) applied an extended TAM by adding attitude and external variables to the adoption of an e-learning system and found that mandatory settings were the most effective and necessary environments for adopting e-learning. Many employees in mandatory environments may rebel against harsh systems through passive resistance, such as talk in the hallways, and active resistance, such as sabotage or quitting. TAM is not a descriptive model and does not provide diagnostic capabilities for finding flows in a technological implementation. Hence, there is the need to expand the model to find causes of technology resistance. Venkatesh and Davis (1996) have discussed that the TAM can help predict acceptance, but does not always help us understand and explain acceptance beyond attributing the system characteristics of ease of use and usefulness.

Technology Acceptance in Other Settings

Estimates suggest that over half of all new technology implemented will fail and failed implementations can be particularly disruptive in many ways. Failure impacts current work performance and productivity. It also leads to cynicism and negative feelings toward future change endeavors (Reichers, Wanous, & Austin, 1997). The impact of failure can be devastating. Employees regret time and resources wasted trying to sustain a failed system. People question authority by asking what other ways the money used on the new program could have been better spent on other aspects of the company, such as bonuses or research and development. Employees become jaded to new initiatives and change-management efforts that may be critical to the company's success. Failed technology efforts can cause a company to lose flexibility and the ability to adapt to changes in the future. Adaptability is a key survival tactic for corporations in the future (Reichers et al.).

Fisher and Howell (2004) discussed intended and unintended outcomes to the implementation of Information Technology Systems. Their research discussed what positive outcomes should be encouraged and what negative outcomes should be rejected. The outcomes include *affective, cognitive*, and *behavioral* outcomes for the organization. Intended reactions of affective outcomes include employee satisfaction, enthusiasm, positive attitudes about the system, and strong computer self-efficacy. Unintended negative reactions include dissatisfaction with the system, cynicism toward current and future change efforts, and frustration with the company and the new technology. Intended reactions to cognitive outcomes include knowledge of how to use the system, perceived usefulness of the system, and perceived control over the employees' environment.

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Unintended cognitive outcomes include positive and negative talk and actions between employees and a misinterpretation of corporate values and goals. Behavioral outcomes include the intended use of the system and an increase of productivity. Unintended behavioral consequences include resistance to the new system, decreased work productivity, industrial system sabotage, employee turnover, and knowledge sharing. This also supports Rogers's (1995) famous work on innovation when describing the importance of compatibility of new innovations with the values and belief of the innovation being adopted. An innovation that runs counter to the accepted values or beliefs of a group be less likely to be adopted and more likely to create the negative unintended outcomes.

Karahanna, Agarwal, and Angst (2006) comprehensively researched the concept of compatibility as it relates to the TAM. Their work extended TAM research to include external variables that analyzed a variety of compatibility issues such as if the system was compatible with the current employee work style, compatible with existing work practices, compatible with prior experiences, and compatible with the company's values. The results of this research showed a relationship with perceived usefulness and compatibility with work style.

Fisher and Howell (2004) outlined the design factors of a system as a reflection of the organization. These factors include purpose, control, trust, accessibility, data availability, and innovativeness. According to Fisher and Howell, it must be determined if the purpose of the new system is to support the employees' current job situation and desire to move forward or is a threat to their job security. Employees will want to know if the new system will focus on their career development or career appraisal. The new

controls must determine how much influence the system has over the business process and what safeguards are implemented to prevent system and user errors. The question of user trust must be addressed to ensure that the user understands that micromanagement is not the purpose of the new system. User accessibility is another design factor that needs further consideration: The level of user access to information will have to be determined and the question of whether that access provides help and support to the user. Data availability and process responsiveness are important design factors because a slow system response can have devastating outcomes. Finally, perceived innovativeness is an important factor because organizations must be current with industry trends. Any outdated system implementation in a business organization is contrary to best practices. These factors must be related to the perceived permanence of the system or users may interpret the technological innovation as part of a political game with the system lasting as long as the key players can defend it before it is replaced by another system.

One situation outlined by Klein and Sorra (1996) described a situation where a new system was implemented in a manufacturing company to help control inventory. The technology was initially accepted and inventory accuracy greatly improved. The system disrupted previously flexible production practices and employees who normally circumvented procedures for rush orders were unable to perform these tasks. This system inflexibility led to negative feelings and ultimately failure for the system. Negative unintended outcomes can have devastating effects on performance.

Another example occurred when Fisher, Quinn, and White (2001) studied an organization implementing an online appraisal system that required the employee, immediate supervisor, and second-level manager to all access and appraise a document at

various times in the process. Employees found this process overly burdensome. These implementations led to active resistance, sabotage, and sometimes employee turnover. Shim and Viswanathan (2007) studied the use of personal digital assistants and their impact of perceived usefulness and perceived ease of use during the implementation of a pharmaceutical system. The initial focus of this research was on technology acceptance, but found that the technology system was flawed and lacked the necessary analyses when being developed to be an effective tool for end users. Development of the correct tool and technology system is critical to successful technology adoption.

Another industry that benefited from the TAM in understanding causes of resistance is the health-care industry. Using the TAM, Yarbrough and Smith (2007) analyzed a variety of reports and research to locate barriers to perceived ease of use and perceived usefulness regarding newly introduced technology in the healthcare industry. The meta-analysis located numerous impediments to perceived ease of use and usefulness, such as time and practice issues, organizational issues, personal issues, and system-specific flaws impacting a physician's attitude. Many corporate cultural issues in the healthcare industry also surfaced, such as lack of organizational structures that support teamwork and team learning. There were also issues related to compensation and incentives for learning. A similar study involving the expansion of the TAM being applied to the health care was conducted by Klein (2006) and included variables addressing the software vendor and trust as a behavioral construct. The research focused on the many settings where the TAM has to measure surrounding environments in addition to the internal qualities of the respondents.

Ndubisi, Gupta, and Ndubisi (2005) researched the relationship between entrepreneurship traits and the TAM. This research focused on individual traits of a group of people in the hopes of locating similarities between the entrepreneurial mindset and the mindset of those who adopt new technologies for the company. The research discovered that perceived usefulness has a strong influence on an entrepreneur's use of a new technology system. Perceived ease of use was found to have no direct relationship for usage among entrepreneurs, but did have an impact on perceived usefulness. The research also recommended an expanded TAM to include innovativeness, perseverance, and flexibility. These traits touch on important qualities among employees who adopt new technology.

Kulviwat, Bruner, Kumar, Nasco and Clark (2007) researched the connection between technology acceptance and human emotions by adding the Pleasure, Arousal, and Dominance theory to the TAM. This theory extended the TAM and was known as the Consumer Acceptance of Technology model. The first dimension of this expanded TAM was pleasure, which is described as an enjoyable reaction to stimuli. The second dimension was arousal, defined as a combination of mental alertness and physical activity when responding to stimuli. Finally, the TAM was expanded with the construct known as dominance, the extent to which the respondent feels in control of or controls the stimuli. The extended variables were chosen because they had been used many times in the past to measure marketing trends and explore how powerful people react to situations. Research by Kulviwat et al. was initiated to question whether higher perceptions of usefulness would lead to more positive attitudes of adapting to new technology. The

researchers also believed that higher perceptions of ease of use would also lead to more positive attitudes in adapting the new technology.

Another construct that was measured was relative advantage. This variable has been described in the works of Rogers (1995) as an innovation regarded by adapters as superior to the product or idea that it was intended to supersede. The researchers believed that the higher the perceived relative advantage, the greater the perceived usefulness of the product, and the more positive attitude toward the innovation. Studying the relationship between the extended variables, the researcher stated that high levels of pleasure, arousal, and dominance would lead to a more positive attitude regarding acceptance of the technology. According to Rogers, a positive attitude affects cognition and adoption of technology and has a direct effect on consumer intention to adopt technology. The results of this research showed that perceived usefulness had a direct influence on technology acceptance and it was unclear whether relative advantage had a direct impact on technology acceptance. In regard to the extended variables, pleasure and arousal were significant predictors of positive attitudes and ultimately the adoption of technology. Research by Kulviwat et al. is parallels the themes in Rogers's report, in that an extended TAM model was successfully combined with another model to study human characteristics in the hope of finding predictability in employee technology acceptance.

Venkatesh, Davis, and Morris (2007), who were founders in the study of technology acceptance, argued that although there has been impressive progress in the field of technology-adoption research, there is too much focus on replication and changing of the models. There need to be new questions asked that can leverage current

knowledge with relevant problems to find research directions that can develop new solutions.

Cultural Limitations and the TAM

The TAM has been empirically reviewed and modified in a variety of settings with various levels of success. The TAM has not been rigorously tested internationally and should be used in many different types of cultural philosophies to truly become an internationally accepted model (Almutairi, 2007). There have been several examples of applying TAM to various countries around the world. Savitskie, Royne, Persinger, Grunhagen, and Witte (2007) applied the TAM in the context of Norwegian Internet shopping sites in the hope of understanding the relationship between TAM, involvement, and affinity with the computer and to examine how the TAM works in an international setting. The researchers noted a need to continue expanding and testing the TAM for validation and usefulness in different cultural settings.

Pei, Zhenxiang, and Chunping (2007) successfully extended the TAM to measure website design effectiveness for Chinese B2C websites. They had found that design factors, service, structure, and function give positive impact to the perceived usefulness and perceived ease of use among Chinese citizens. McCoy, Everard, and Jones (2005), discovered similarities between the United States and Uruguay, but also noted that certain behavioral constructs of the TAM were not comprehensive on an international level. One possibility is that individuals with more positive feelings toward computers are likely to find computers more useful (Scott & Yalch, 1978). Another possibility is that the social structures and conflicting cultural paradigms experienced between respondents from the United States and from Uruguay influenced outcomes.

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There has been some study as to the impact of the TAM in a variety of cultural settings. Continued research and modification of the TAM is necessary for the model to gain international validity as well as validity between public and private organizations Researchers of the TAM often refer to Hofstede's (1980, 1983) four dimensions of culture to extend the TAM using cultural elements. Hofstede (1980) defined culture as "the collective programming of the mind which distinguishes the members of one human group from another" (p.15). This is important because research has shown that certain cultural beliefs act as determinants to technology acceptance. The four value dimensions of culture, according to Hofstede (1980, 1983) are *Power Distance, Uncertainty Avoidance, Individualism vs. Collectivism*, and *Masculinity–Femininity*. Power distance is the extent to which members of a society accept that power in institutions and organizations is distributed unequally. There is a great deal of status difference among workers when compared to more egalitarian-based societies. Uncertainty avoidance is the degree to which members of a society feel uncomfortable with uncertainty and ambiguity and whether or not they reward, acknowledge, and praise risk takers. Individualism and collectivism indicate preferences for a social framework where individuals take care of themselves (as in individualism) or individuals expect the group to take care of them in exchange for loyalty. Finally, some cultures have a high preference for achievement, assertiveness, and material success (traditionally referred to as masculine societies) and some have a lower preference for these traits (considered feminine societies).

Lippert and Volkmar (2007) studied the differences between the cultural effects on technology acceptance and gender between U.S. and Canadian populations. The study integrated the TAM with the work of Hofstede (1983) on culture comparing masculine

and feminine values in technology-adoption attitudes and behaviors. Lippert and Volkmar found that there were significant differences between men and women in the United States, but not between Canadian men and women. The report showed that gender played a large role in the United States in using new technology. This may impact the current study because a predominate section of the sample and a large percentage of those in the field of education are female.

Another study merging the TAM with Hofstede's (1984) four cultural dimensions was conducted by McCoy, Galletta, and King (2007) and included almost 4,000 students around the world. McCoy chose students who lived in countries that scored either very high or very low on Hofstede's four cultural dimensions. The study showed that the TAM did not hold across all cultural groups. Findings involving culture's impact on the TAM is critical because many feel that the TAM is universal (McCoy et al., 2007). The TAM was found to be insignificant when people scored low on UA, high on PD, and high on Masculinity, and high on Collectivism.

People who were low in uncertainty avoidance did not require assurances of usefulness and ease of use as opposed to individuals with high uncertainty avoidance. Ease of use and usefulness are not important to people who are trying to avoid uncertainty. People scoring high in power distance will not need to be enticed by usefulness or ease because of their tendency to respect the commands of higher authority. Individuals who scored high in masculinity were not influenced by perceived ease of use because these individuals were more focused on goal attainment than perceived ease of use. High collectivism also hampered the effects of perceived ease of use because individuals are more focused on accomplishing the goals of the group than concerning

themselves with the usability of the technology. These cultural concerns are important in expressing the need to expand the TAM and to explain other factors that could indicate cause results in the research of this thesis.

Almutairi (2007) researched the application of TAM in the Kuwaiti ministries because of the overwhelming amount of focused research on the TAM in western countries. Almutairi's research focused in Kuwait to measure the effect of TAM in an Arab country to see the impact of culture on the TAM because of a need for international validity, accomplished by applying the TAM to a wide variety of cultures. Almutairi found that there were almost no relationships in the TAM to the members of the Kuwaiti ministry accepting new technologies.

The TAM has been tested in implementations involving international government organizations introducing new technologies to their citizenry. Wang (2003) studied attempts by the Taiwanese government to identify factors affecting the adoption of an electronic tax-filing system using the TAM. The study found important factors related to developing effective electronic government services in general and effective electronic tax-filing services. Tahinakis, Mylonakis, and Protogeros (2006) studied the taxation system of Greece to develop an understanding of the influence e-governments have on the application of modern information systems that support direct and indirect taxation. The results of this research showed that electronic tax processes and the increased participation of taxpayers will create a socioeconomic environment that will improve relations between the tax administration and taxpayers. Fu, Chao, and Farn (2004) studied the Taiwanese electronic tax-payment system to develop an understanding of the factors that influence if and how the taxpayers would adopt the electronic tax-filing

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services. This study showed that taxpayers who adopted the manual tax-filing method perceived lowest overall satisfaction in the system. Internet filing had very mixed results for technology acceptance and overall customer satisfaction.

Chang, Li, Hung, and Hwang (2005) studied an international Internet tax-filing system to examine acceptance of filing systems using the TAM. The TAM proved to be a valid model to measure users acceptance of the taxpaying system. An unusual finding in this research was that perceived usefulness had indicated a greater impact on the intention to use the system than perceived ease of use. Hung, Chang, and Yu (2006) studied online tax-filing and payment systems in Taiwan using the TAM to identify the factors determining the public's acceptance of e-government services. The result of their study showed that the TAM and Theory of Planned Behavior with modifications could explain 72% of variations regarding the intention of users to use the system. Sahu and Gupta (2007) studied the acceptance or rejection of e-government by users of the Indian Central Excise using an expanded TAM. The research indicated that attitude toward using e-government and performance expectancy are strong determinants in using the system.

The TAM was also recently tested on agricultural students in Iran at the University of Tehran by the research team of Rezaei, Mohammadi, Asadi, and Kalantary (2008). The research is similar to the present study because they used an extended TAM in an educational institute where there was resistance to e-learning. The extended TAM variables in this research study included *internet experience, computer anxiety, age, computer self-efficacy*, and *affect*. The results of this research showed an inverted relationship between age and e-learning. It seems that the older learners get, the less likely it is that they intend to use e-learning. Computer anxiety greatly reduced student

intent to use e-learning. Learners who scored high in internet experience and computer self-efficacy reported more positive attitudes toward e-learning. This research could have implications on future studies to include some of the variables mentioned in the present study. Similar research was conducted in Taiwan on adolescents who intended to take online courses. Tung and Chang (2007) created an extended TAM, which included computer self-efficacy, computer anxiety, and innovation-diffusion theory to explain adolescent technology acceptance. The research showed that computer self-efficacy had a powerful impact on the behavioral intent of adolescents to use online learning. Computer anxiety had a negative impact on computer self-efficacy and ultimate intent to use the program.

The CANE Model of Motivation

The CANE model of motivation was developed by Clark (1998b) as a synthesis of major contemporary motivational models and designed to measure motivational challenges in the workplace. The fundamental elements of motivation, according to CANE, are shown in Figure 2.

Two-Stage Model of Motivation:

Stage 1: AGENCY X AFFECT X TASK VALUE = GOAL COMMITMENT
Stage 2: SELF-EFFICACY X GOAL COMMITMENT >>> EFFORT

Figure 2: An early version of the CANE model of motivation.

The CANE model is based on Ford's (1992) motivational systems theory. Ford strove to create a comprehensive model of human motivation using more than 32 motivational constructs. Motivational systems theory includes an extensive list of goal categories and motivational processes. According to the model, motivation is described

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as "the organized patterning of three psychological functions that serve to direct, energize, and regulate goal-directed activity: personal goals, emotional arousal processes, and personal agency beliefs" (p. 3). This model was difficult to apply because of its complexity. A symbolic representation of the Ford motivational systems theory is shown in Figure 3.

Two-Stage Model of Motivation:

Stage 1: AGENCY X AFFECT X TASK VALUE = GOAL COMMITMENT
Stage 2: SELF-EFFICACY X GOAL COMMITMENT >>> EFFORT

Figure 3: An early version of the CANE model of motivation.

Motivation Systems Theory

MOTIVATION = GOALS X EMOTIONS X PERSONAL AGENCY BELIEFS

Figure 4: Ford's motivational systems theory, an early attempt to formulate motivation.

The robust and inefficient nature of Ford's motivational systems theory required the development of a simpler, more efficient motivational model. The original CANE model was intended to measure motivation in academic settings. This model has proven to be highly accurate in predicting academic behavior (Condly, 1999).

According to Condly (1999), the CANE model has three determining factors associated with goal commitment and effort: personal agency (one of the factors being "Self-Efficacy"), emotion, and task value. Condly found that these three factors accounted for most commitment in academic motivation. It may be argued that persistence and effort comprise motivation, and ultimately, technological acceptance. For example, if users feel confident about their ability to use a new technology, feel good about a new technology, and believe that the new technology will help; this may lead to

acceptance of the new technology. The next three sections detail the constructs of the CANE model of motivation and how each construct relates to this study.

Perceived Organizational Support and Agency

Agency is composed of self-efficacy and perceived support from the organization. Self-efficacy is an important variable in the CANE model because outcomes are often rooted in individuals' personal beliefs about their abilities (Bandura, 1997). Self-efficacy describes the inward perception of the question *Can I do this task?* It is formed from a variety of individual experiences (Bandura, 1986). These combined experiences lead to a construct with the capacity for highly predictable behavior in employees (Igbaria et al., 1995). The work of McFarland and Hamilton (2006) has led to the following theories related to self-efficacy.

1. Self-efficacy is one's belief in one's capability to produce an outcome rather than an assessment regarding the impacts of the outcome.

2. The focus of self-efficacy is on overall results rather than component level skills.

3. Self-efficacy is a judgment of "what one can do."

4. Self-efficacy is a distinctive, valid, and significant construct (Bandura, 1997; Gist & Mitchell, 1992; Igbaria & Iivari, 1995).

Agency also refers to the belief that the organization supports an employee in a task. These perceptions can be positive or negative and greatly influence a person's motivation toward and acceptance of a new technology. Perceptions may or may not be an accurate representation of reality (Bandura, 1997). Bandura believed that behaviors

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were the determinants of a person's beliefs and that only if someone believed a behavior

was possible would the behavior be produced. The question regarding agency would be:

Can I do this task under these conditions?

Organizational support is critical because it is a determining factor in motivation

and technology acceptance. The attitudes and beliefs of others in groups shape

technology use behavior through communication. Social interactions generate meaning

and understanding and provide patterns of behavior (Agarwal & Karahanna, 2000;

Agarwal & Prasad, 1997, 1999). Altering political and social dynamics in the department

can hinder the acceptance of new ideas and reduce motivation (Premkumar & Potter,

1995).

Attitude Toward LiveText

The CANE model describes affect in two concepts: emotion and mood. Emotion

is described as an individual's feelings produced by the task. Emotions play a key role in

blocking acceptance of information technology (McKenzie, 1998). Mood focuses on the

feelings an individual brings to the task. The CANE model of motivation measures

emotion in terms of duration and volume and whether the emotion is long term or short

term (Condly, 1999). Emotion can be either positive or negative. The user feels a positive

or negative emotion toward a subject. This measurement is critical because an individual

may feel that they can use a new technology and that the new technology would be

useful, but could, nevertheless, dislike it and therefore reject it.

Perceived Usefulness Toward LiveText

The utility component from the CANE model of motivation is composed of three constructs: importance, interest, and utility. This component comes from the research on task value from the work of Eccles and Wigfield (1995). Their work focused on four types of values: attainment value, intrinsic value, cost belief, and extrinsic utility value.

Attainment value can also be considered as the importance of doing a task well as it relates to someone's identity. In this case, it would be that professors want to do well at LiveText to maintain their identity with their faculty peers and their students. Attainment value would not be a major principle in the adaptation of technology because professors do not attach personal identity with the usage of online management software.

Intrinsic value is defined as the inner enjoyment someone would feel that would motivate them to perform a task. Based on the responses given during interviews with the faculty, inner enjoyment gained from using online data-management software would not be a major principle in the acceptance of technology because most employees do not experience a significant amount of inner pleasure in using new software.

The last components of task value that would directly impact the acceptance of technology are utility value and cost belief. Utility value entails how useful the task is toward future objectives such as career goals. Cost belief refers to the time and resources devoted to a task that could be used for better purposes. The concepts of utility value and cost belief have a direct relationship to this study because if professors feel that learning LiveText has no bearing on their career goals or if they feel that they can use their time and energy in more effective ways toward achieving goal success than learning or using LiveText, then they will not use LiveText. Research on task value is derived from

Pintrich and Schunk (1996, 2002). Their research focuses on expectancy as an important

mediator for motivation. If professors feel that the ultimate outcome of the time spent

learning and using LiveText leads to great success, then there may be higher levels of

use. Based on the responses, if professors feel that ultimately their attempts at learning

and using LiveText will lead to wasted time and effort or negative feelings, then the

employee will be less likely to learn LiveText.

The CANE model defines the construct of importance as to how closely

individuals identify themselves with the task. The question to be asked is *Is this task me?*

Note that due to the type of task in this study, it is unlikely that a respondent will

personally identify with online management software. Therefore, this construct will not

be used in the research.

Interest is the second utility component of the CANE model. Interest focuses on

intrinsic rewards, such as enjoyment or curiosity, received by an individual engaged in a

task (Clark & Estes, 2002). This interest leads to the internal motivation to overcome

obstacles in the desire for an internal reward. The increase in internal motivation may

ultimately lead to greater acceptance of technology.

Utility is the third utility component and is similar to perceived utility in the TAM

because it addresses relevance that is subjective and individual to each user. Ford (1992)

discussed the need for specific opportunities for the goal to be meaningful. These

opportunities create meaning for the user and commitment to the new technology. When

discussing utility, the questions to ask are, *Is this worth my while?* and *Do I get anything*

out of this? If the user perceives the task is valuable, then motivation and acceptance may

ensue.

The CANE model focuses on motivation but does not specify factors of technology acceptance. By itself, motivation is one factor in the acceptance of technology. The next section discusses the formation of a hybrid model that links the CANE model and the TAM to measure motivation and technology acceptance among employees.

Proposal to Create a Hybrid Model

A successful model derived from the fusion of the CANE model and the TAM may provide a better understanding of user perceptions and use of technology. In this study, the accessible population is the education faculty who use LiveText at a college in a large southeastern university.

Davis' (1985) TAM focuses on belief–affection–belief relationships and was designed to be expanded with other constructs. Earlier, the literature review presented numerous examples of such expansions. However, there is limited research on the use of the TAM and motivational measures with academic faculty. As Davis (1993) demonstrated, technology acceptance is determined by a variety of motivators. In this study, the author proposes to incorporate the robust CANE model into the TAM to account for the motivational aspect of technology acceptance. This is congruent with Legris, Ingham, and Collerette's (2003) assertion that TAM must be integrated into a model that includes other variables such as change processes to functionally measure innovation. The TAM and the CANE model have been extensively tested and validated in areas other than instructional technology. The TAM can provide information on the way users form attitudes based on characteristics of technologies; the CANE model can explain how attitudes are influenced by motivational factors.

The proposed model is the MAM. The MAM was created from the basic elements of motivation and technology acceptance. The purpose of the MAM is to strengthen the TAM model by expanding the behavioral constructs to include motivational elements. The MAM combines factors of the CANE model and TAM to include

1. Perception of support and agency

2. Perceived ease of use and self-efficacy

3. Perceived usefulness and utility

4. Attitude toward the technology

5. Actual use

This study uses the proposed MAM to examine the motivation toward and acceptance of LiveText among faculty in a college in a large southeastern university.

CHAPTER THREE: METHODOLOGY

Introduction

The research design and procedures of data collection and data analysis are presented in this chapter. Specifically, population and sample selection, data collection, data instrument, design of the study, data-collection procedures, and data-analysis procedures are addressed in detail. This study used regression analysis, t-tests, and descriptive statistics. A hypothetical model was designed to measure technology acceptance inspired by the TAM and CANE to measure the impact of perceived ease of use, perceived organizational support, attitude toward, and perceived usefulness of faculty in a college in large southeastern university who use LiveText. Participant demographics were examined.

The purpose of this study was to investigate the correspondence between faculty attitude toward the use of LiveText and their actual use of LiveText by using the MAM. The question is asked, "What are the relationships between the components of the MAM?" From this research question, one can derive the following hypotheses:

H_1: An increase in positive attitude toward, perceived usefulness, perceived ease of use, and perception of organizational support toward LiveText will result in a statistically significant increase in the use of LiveText.

H_2: An increase in perceived ease of use and perception of organizational support toward using LiveText will result in a statistically significant increase in liking LiveText.

H_3: An increase in perceived ease of use and perceived organizational support of LiveText will result in a statistically significant increase in the perceived usefulness of LiveText.

Design of the Study

This is a regression study of faculty use of LiveText at a college in a large southeastern university. This university has over 46,900 students and 21 campus locations within an 80 miles area. Students can choose from 95 undergraduate degree programs, 96 masters programs, 3 specialist programs, and 25 doctoral programs.

The participants of this study included the population of faculty who are scheduled to use LiveText at a college in a large southeastern university. According to the 2004 survey from the Office of Institutional Research, the faculty at the college includes 161 people. The College of Education faculty members service approximately 5,000 students in 12 undergraduate programs and 25 graduate programs. The adjunct faculty population in 2004 was composed of 94 instructors: 73 females and 21 males. The demographic breakdown was 81 White, 6 Hispanic, 6 Black, and 1 Asian.

Although most undergraduate faculty are required to use LiveText, LiveText is used by faculty to a varying degree. In this paper, the predictability among the use of LiveText and variables such as perceived usefulness, perceived ease of use, perceived organizational support, and attitude toward LiveText was explored and measured.

Study Population and Sample Selection

The target population of this study was selected from a current roster of adjunct and faculty instructors from the four major departments in this college:

1. Child, Family, and Community Sciences

2. Educational Studies

3. Educational Research, Technology, and Leadership

4. Teaching and Learning Principles

From these departments, a master list of all instructors in the College of Education was
compiled. The list included 127 professors, of which 59 adjunct and full time professors
completed the survey about whether they used LiveText. The participants were chosen
randomly and the professors who did not participate were reselected and rerandomized.
Of the 59 professors, 25 completed the user survey and 34 completed the nonuser survey.
There was some resistance among faculty to take part in this survey. Participation was
totally voluntary. Participants were anonymous and were not required to provide signed
consent based on approval provided by the UCF Institutional Review Board (see
Appendix L). Of the 59 participating professors, 20 respondents (33.9%) were between
the ages of 51 and 60, 30 of the respondents (66.1%) were female, 44 of the respondents
(74.6%) have worked in the field of education for more than 6 years, 28 of the
respondents (47.5%) have been affiliated with the large southeastern university for more
than 6 years, and 49 of the respondents (83.1%) were White.

Data-Collection Instrument

Faculty members were given a particular survey depending on whether they were
users (see Appendix A) or nonusers of LiveText (see Appendix B). The survey was
developed based on the pertinent literature to measure their perceptions of LiveText. All
the participants had heard of LiveText and had an opinion about it. The surveys for users

had more questions than the one for nonusers because there was much more information

that could be acquired from users than nonusers. Information from users included

frequency and familiarity of LiveText (as exhibited in Appendices I and J). The surveys

were constructed using a 5-point Likert scale measuring faculty perception on the

variables that compose the MAM and yes or no or other responses for use and

demographics questions. This survey also used Yes or No questions to determine who is

using LiveText and their familiarity with the functions of LiveText. The surveys

measured the relationships between the variables of perceived usefulness, perceived ease

of use, attitude toward regarding LiveText (how much they like to use LiveText),

perceptions of organizational support, and actual use. For a baseline, the first instrument

assessed the respondent's general perception of the utility of computers and technology

(Appendix C). The surveys also measured demographic information, specifically age,

gender, length of employment in the field of education, length of affiliation with the large

southeastern university, and ethnicity. The questions for the survey were constructed

based on prevailing literature (see the literature review) and focus on the scales shown in

Tables 1 and 2 (Agarwal & Prasad, 1997; Bandura, 1982; Clark, 1998a, 1998b; Clark &

Estes, 2002; Davis, 1985, 1986, 1989, 1993; Davis et al., 1989; Dishaw & Strong, 1999;

Gong et al., 2004; Hu et al., 2003; McFarland & Hamilton, 2006; Moon & Kim, 2001;

Roca et al., 2006; Savitskie et al., 2007; Sun & Zhang, 2006; Venkatesh & Davis, 2000).

Perceived Usefulness Instrument

The Perceived Usefulness Instrument measures the professors' perception of the

usefulness and the level of serviceability (utility) LiveText provides (see Appendix E).

Davis (1989) argued the importance of perceived ease of use in exerting influence on

perceived usefulness and ultimately on attitude toward using a new technology. The

research regarding perceived usefulness was measured using seven items on a 5-point

Likert scale with 1 as "Strongly Disagree", 2 as "Disagree", 3 as "Neither Agree nor

Disagree", 4 as "Agree", 5 as "Strongly Agree", and N/A as "Not Applicable."

Table 1
Scale Outlining the Number of Items for the LiveText Users Survey

Item types	Number of items
1. General view of technology	3
2. Perceived usefulness	5
3. Attitude (how much they like LiveText)	3
4. Perceived ease of use	5
5. Perception of organizational support	7
6. Perceived student usage of LiveText	5
7. Proficiency in LiveText	26
8. LiveText usage	4
9. Demographics	5
TOTAL	63

Table 2
Scale Outlining the Number of Items for the LiveText Nonuser Survey

Item types	Number of items
1. General view of technology	3
2. LiveText usage	1
3. Perception of organizational support	7
4. Perceived usefulness	2
5. Attitude (how much they like LiveText)	3
6. Perceived ease of use	2
7. Perceived student usage of LiveText	5
8. Demographics	5
TOTAL	28

Perceived Ease of Use Instrument

The Perceived Ease of Use Instrument measures the professors' perception of

how easy it is to use LiveText and the perception of their own personal technological

capabilities compared to how difficult they think LiveText is to use (whether or not they

have already used it because questions are based on perceptions; see Appendix E). There are many factors that could be added as variables to perceived ease of use to address latent factors. All of the possible variables could not be addressed in the interest of this study. Davis (1989) postulated that perceived ease of use plays an important role on the impact of perceived usefulness and ultimately on attitude toward using a new technology. The research regarding perceived ease of use was measured using six items on a 5-point Likert scale with 1 as "Strongly Disagree", 2 as "Disagree", 3 as "Neither Agree nor Disagree", 4 as "Agree", 5 as "Strongly Agree", and N/A as "Not Applicable."

Attitude Toward Instrument

The Attitude Toward Instrument is designed to measure how the professors feel toward LiveText (see Appendix F). Attitude toward was measured using six items on a 5-point Likert scale with 1 as "Strongly Disagree", 2 as "Disagree", 3 as "Neither Agree nor Disagree", 4 as "Agree", 5 as "Strongly Agree", and N/A as "Not Applicable."

Perception of Organizational Support Instrument

The Perception of Organizational Support Instrument is designed to measure the professors' perception of how supportive the university is toward the respondents' use and implementation of LiveText (see Appendix G). This instrument also measures how professors perceived the university's support for students in the use of LiveText. The research regarding perception of support was measured using six items on a 5-point Likert scale with 1 as "Strongly Disagree", 2 as "Disagree", 3 as "Neither Agree nor Disagree", 4 as "Agree", 5 as "Strongly Agree", and N/A as "Not Applicable."

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Actual Use Instrument

The Actual Use Instrument is designed to measure whether or not the professor is currently using LiveText (see Appendix H). The research regarding actual use was measured using one item with the statement reading "I use LiveText" and the choices of "Yes" or "No."

Familiarity Instrument

The Familiarity Instrument is designed to measure which of the variety of functions in LiveText the professors use (see Appendix I). The respondents were asked if they were familiar with or used the multitude of functions LiveText provides. The research regarding familiarity of LiveText functions was measured using 26 items with "Yes" and "No" responses.

Amount of Actual Use Instrument

The Amount of Actual Use Instrument is designed to measure the frequency of LiveText use by the respondents who are considered users (see Appendix H). The research regarding amount of actual use is measured using three items. The instrument measures how often they use LiveText on a daily and weekly basis: "Less than once a week," "About once a week," "2 to 3 times a week," "4 to 6 times a week," "about once a day," and "several times a day." The instrument measures the number of times LiveText is used during the semester: "More than twenty times a semester," "Ten to twenty times a semester," "Five to nine times a semester," and "One to four times a semester." The instrument measures the approximate amount of time spent during each use of LiveText:

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"Less than 15 minutes," "Between 15 and 30 minutes," "Between 31 and 45 minutes,"

"Between 46 and 60 minutes," and "More than 60 minutes."

Demographics Instrument

The Demographics Instrument is designed to measure characteristics of the respondents (see Appendix K). Five items were implemented to measure descriptive information about respondents: age, gender, length of time they have worked in the field, length time they have been affiliated with the large southeastern university, and ethnicity.

Data-Collection Procedures

Endorsed by the UCF Institutional Review Board, the research project was expedited and executed during the Spring 2007 semester (see Appendix L). Participants were not compensated for their efforts. A random list of professors was generated and each professor was asked "Do you use LiveText?" They were then given in person, by mail, and placed in their box (depending on the professor's schedule and preference) a survey for users or for nonusers. Once the survey was completed, the surveys were placed in a nondescript manila folder with no identifiable markings to indicate who had taken the survey and the name of the person was checked on a list. The list was destroyed to protect anonymity and the folder was placed in a secure, locked location.

Data-Analysis Procedures

After the surveys were collected, the data were entered into SPSS Version 15 to perform further analysis using Cronbach's alpha, regression, *t*-tests, and descriptive statistics. Though the instruments were adapted from the literature, the author attempted to reaffirm that all the instruments were reliable to a satisfactory degree. Cronbach's

alpha was used to measure internal consistency using the Reliability Analysis function in SPSS.

Data analysis was conducted in five stages. The first stage involved testing the various variables of perceived ease of use, perceived usefulness, attitude toward, and perceived organizational support for reliability using Cronbach's alpha. The second stage involved testing the dependent variables of the MAM using regression (see Figure 4 and Table 3 to view the model and the dependent and independent variables that compose each regression).
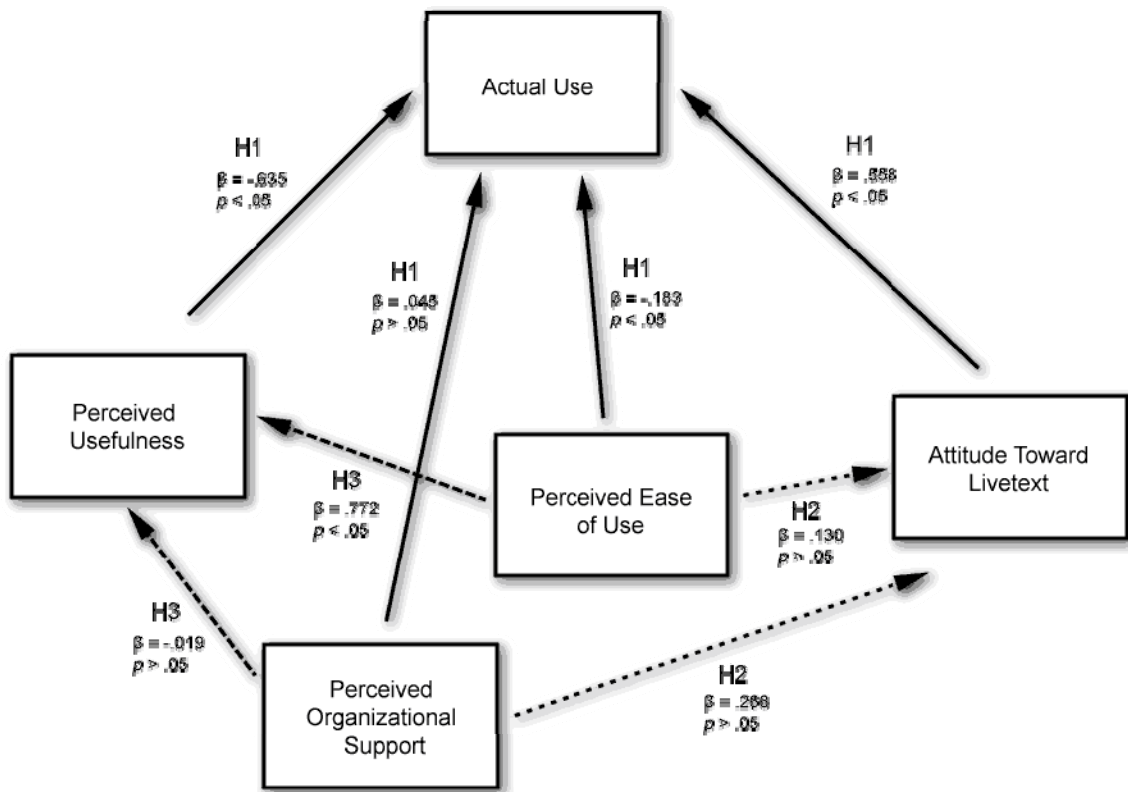
Figure 5: The dependent and independent variables of the MAM.

The third stage involved comparing users and nonusers of LiveText on the variables of perceived ease of use (PEU), perceived organizational support (PS), attitude

toward (AT), and perceived usefulness (PU) using independent-sample *t*-tests. The fourth

stage was a recalculation of the TAM using the number of actual-use variables that

determine how each variable (PEU, PS, AT, and PU) influenced how each user actually

used LiveText. Multiple regression analyses were conducted to determine the influence

of MAM components on various facets of LiveText use such as (a) analysis of LiveText-

use frequency based on daily or weekly dates, (b) analyses of use based on frequency

over the semester, and (c) how long LiveText is used during a session. Only users were

measured. The actual-use variables included how often a respondent used LiveText (such

as monthly, weekly, or daily), how long each use lasted (minutes or hours), and how

many times they used LiveText during the semester. The fifth and final stage of analysis

involved descriptive statistics related to the functions of LiveText that users are aware of

and whether they use these functions.

Table 3

Regressions Testing Predictability Between Variables of the MAM

Regression	Independent variables	Dependent variable
One	Perceived Ease of Use (PEU) Perceived Organizational Support (PS)	Perceived Usefulness (PU)
Two	Perceived Ease of Use (PEU) Perceived Organizational Support (PS)	Attitude Toward (AT)
Three	Perceived Ease of Use (PEU) Perceived Organizational Support (PS) Perceived Usefulness (PU) Attitude Toward (AT)	Actual Use (AU)

Summary

This study used regression for two purposes: (a) testing the MAM and (b) replicating the TAM with expanded motivational variables. The study also used independent *t*-tests to compare the users and nonusers in their behaviors regarding LiveText. Of the 127 faculty members who were contacted, 59 volunteered to take part in this survey study. The study used two surveys composed specifically for users and nonusers (see Appendices B and C). The LiveText Users Survey included nine scales (see Table 1) and the LiveText Nonusers Survey included eight scales (see Table 2). Surveys were collected and housed in a locked cabinet until they were entered into SPSS as a password-protected file. Regression and *t*-test analysis procedures in SPSS were used to analyze relationships between and among variables, users, and nonusers. Variables in this study correspond to the constructs that provide the theoretical foundations for observations based on the ratings and measurements collected.

CHAPTER FOUR: FINDINGS

Introduction

The purpose of this study was to investigate the correspondence between faculty attitude toward the use of LiveText and their actual use of LiveText by using the MAM. The MAM is an expanded version of the TAM, incorporating such motivational models as the CANE model of motivation. Furthermore, this study was designed to determine some of the differences between users and nonusers of LiveText. Users of LiveText were also questioned regarding the functions they are familiar with and the functions they actually use. Users were also questioned regarding how frequently they use LiveText and the duration of time spent in a LiveText session.

A total of 59 faculty members participated in the study. Of the 59 faculty members, 25 were classified as users and 34 were classified as nonusers. Each respondent was given the appropriate survey (see Appendices B and C). The research effort was voluntary. Participants were purposively sampled and their confidentiality protected.

One research question was explored using three hypotheses. The research question for this study was "What are the relationships between the components of the MAM?" The following hypotheses were developed from this research question:

H_1: An increase in positive attitude toward, perceived usefulness, perceived ease of use, and perception of organizational support toward LiveText will result in a statistically significant increase in the use of LiveText.

H_2: An increase in perceived ease of use and perception of organizational support toward using LiveText will result in a statistically significant increase in liking LiveText.

H_3: An increase in perceived ease of use and organizational support of LiveText will result in a statistically significant increase in the perceived usefulness of LiveText.

Using SPSS v15, the research question and three hypotheses were answered using regression analyses. Independent sample t-test analyses were conducted to determine the differences between the users and nonusers groups. Descriptive statistics were used to determine how LiveText users used many of the software features and how often they used LiveText. Respondent demographics described personal characteristics of the LiveText users.

<div align="center">Reliability of the Data</div>

The LiveText Users Survey consists of nine scales (see Table 1) and the LiveText Nonusers Survey consists of eight scales (see Table 2). Four scales in each survey were used to measure perceived usefulness, perceived ease of use, attitude toward regarding LiveText, and perception of support. In the Users Survey, perceived usefulness had five items, perceived ease of use had five items, attitude toward regarding LiveText had three items, and perception of support had seven items. In the Nonusers Survey, perceived usefulness had two items, perceived ease of use had two items, attitude toward regarding LiveText had three items, and perception of organizational support had seven items. An internal consistency reliability test for these four scales was conducted based on items that were in both user and nonuser surveys. The reliability test was performed in SPSS v15 using the Scale Reliability Analysis function. Table 4 provides the results of the reliability testing.

Table 4
Internal Consistency Reliability Testing

Instrument	Cronbach's alpha	*M*	*SD*
Perceived usefulness	.97	5.05	6.77
Perceived ease of use	.93	4.71	5.69
Perception of organizational support	.88	11.76	4.67
Attitude toward	.99	3.37	4.50

The Cronbach's alpha coefficients of the four scales are presented in Table 4. All

the coefficients exceed .80. All of these four measures are deemed satisfactory.

Hypothesis 1

H₁: An increase in positive attitude toward, perceived usefulness, perceived ease

of use, and perception of organizational support toward LiveText will result in a

statistically significant increase in the use of LiveText.

A standard multiple regression analysis was performed between the dependent

variable (actual use) and the independent variables (attitude toward LiveText, perceived

usefulness, perceived ease of use, and perception of organizational support). Analysis

was performed using SPSS regression. Regression analysis revealed that the model

statistically significantly predicted attitude toward LiveText, $F(54) = 55.1$, $p < .05$. R^2 for

the model was .80, and the adjusted R^2 was .79. Figure 5 shows the standardized

regression coefficients (β) for each variable. In terms of individual relationships between

the independent variables and the actual use of LiveText, perceived ease of use ($t = -$

2.24, $p < .05$) was a statistically significant predictor; perception of support ($t = 0.71$, $p >$

$.05$) was not a strong statistically significant predictor for actual use. Perceived utility ($t =$

-6.84, $p < .05$) and attitude toward LiveText ($t = 7.28$, $p < .05$) were predictors of

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LiveText use. The dependent variables in Figures 5–10 will be depicted as a diamond and the dependent variables will be depicted as a rectangle.
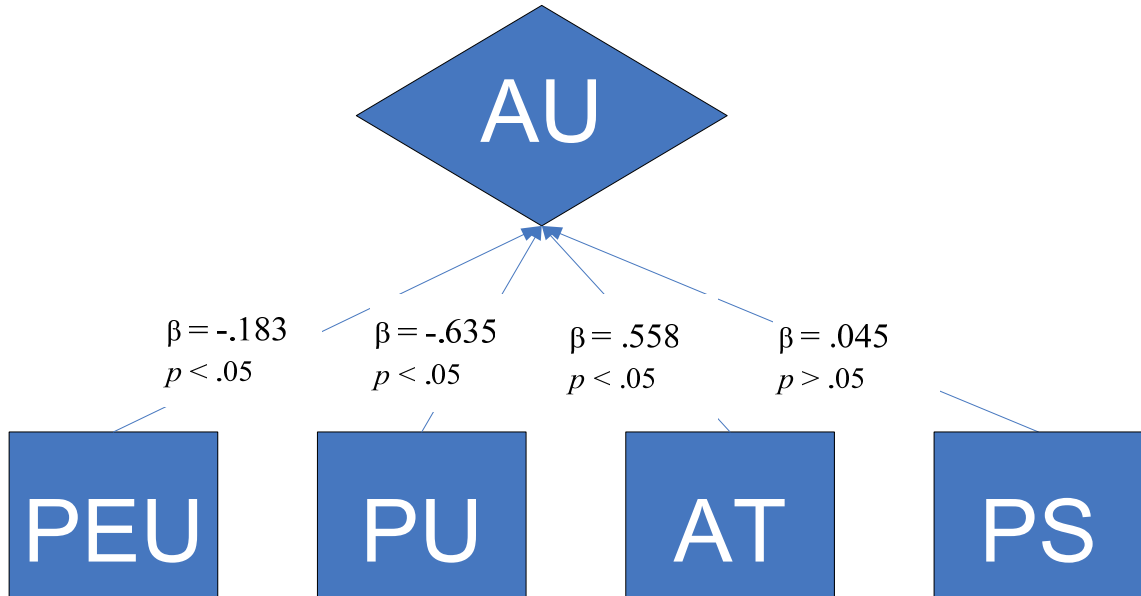
Figure 6: Relationships between variables for Hypothesis 1.

Hypothesis 2

H₂: An increase in perceived ease of use and perceived organizational support toward using LiveText will result in a statistically significant increase in liking LiveText.

A standard multiple regression analysis was performed between the dependent variables (attitude toward regarding LiveText and perceived organizational support) and the independent variables (perceived ease of use and perception of support). Analysis was performed using SPSS regression.

Regression analysis revealed that the model statistically significantly predicted attitude toward LiveText, $F(56) = 3.98$, $p < .05$. R^2 for the model was .12, and the adjusted R^2 was .09. Figure 6 displays the standardized regression coefficients (β) for each variable.

In terms of individual relationships between the independent variables and the attitude toward LiveText, perception of organizational support ($t = 2.00$, $p > .05$) is not a statistically significant predictor of attitude toward LiveText and perceived ease of use ($t = 1.22$, $p > .05$) is also not a statistically significant predictor of actual use.
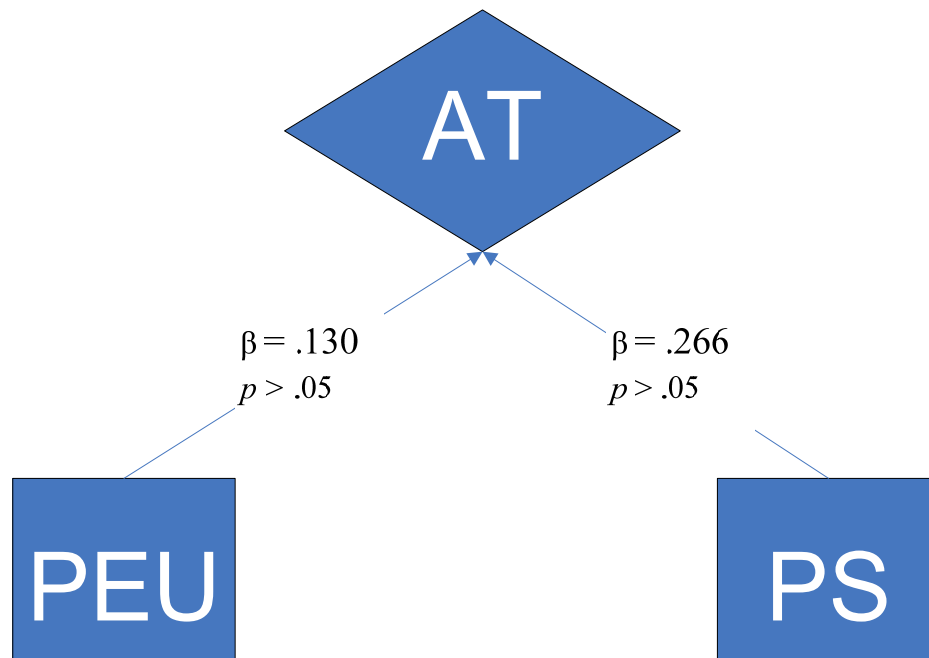
Figure 7: Relationships between variables for Hypothesis 2.

Hypothesis 3

H₃: An increase in perceived ease of use and perceived organizational support of LiveText will result in a statistically significant increase in the perceived usefulness of LiveText.

A standard multiple regression analysis was performed between the dependent variable (perceived usefulness) and the independent variable (perceived ease of use). Analysis was performed using SPSS regression.

Regression analysis revealed that the model statistically significantly predicted perceived ease of use of LiveText, $F(56) = 42.95$, $p < .05$. R^2 for the model was .61, and

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the adjusted R^2 for the model was .59. Figure 7 displays standardized regression coefficients (β) for each variable.

In terms of individual relationships between the independent variables (perceived ease of use and perceived organizational support) and the dependent variable (perceived usefulness), perceived organizational support ($t = -0.18$, $p > .05$) is not a predictor of perceived usefulness. Perceived ease of use ($t = 8.81$, $p < .05$) is a strong statistically significant predictor of perceived usefulness.

Comparison of Users and Nonusers

It is important to understand some of the differences between users and nonusers of LiveText. A series of *t*-tests were conducted to analyze comparisons between users and nonusers in components of the MAM. The analyses focused on comparison of perceived usefulness, perceived ease of use, attitude toward LiveText, and perceived organizational support.
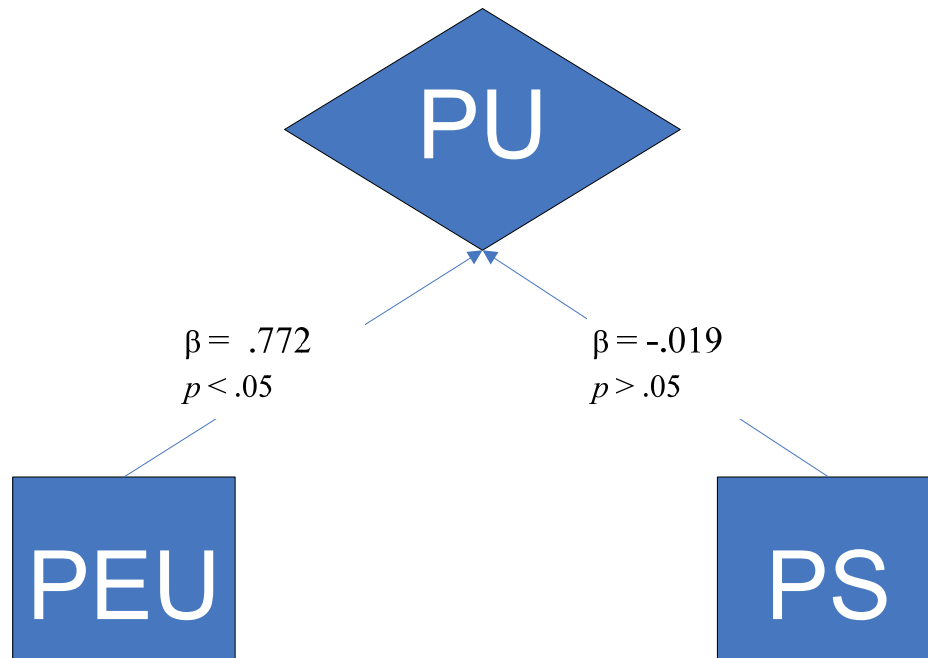
Figure 8: Relationships between variables for Hypothesis 3.

Comparison of Perceived Usefulness

A *t*-test was used to compare levels of perceived usefulness between users and nonusers. This two-tailed *t*-test found a statistically significant difference between the users and nonusers in their perceived usefulness of Live Text, $t(57) = 7.08$. On average, users displayed higher levels of perceived usefulness than did nonusers (nonusers: $M = 0.77, SD = 0.29$; users: $M = 1.70, SD = 0.66$). It should be noted that users displayed higher levels of perceived LiveText usefulness than did nonusers.

Comparison of Perceived Ease of Use

A *t*-test was used to compare levels of perceived ease of use between users and nonusers of LiveText. The two-tailed *t*-test reveals that there is a statistically significant difference between the groups, $t(57) = 8.10$. On average, users displayed higher levels of perceived ease of use than did nonusers (nonusers: $M = 1.11, SD = 0.34$; users: $M = 2.09$

SD = 0.59). It should be noted that users displayed higher levels of perceived ease of use of LiveText than did nonusers.

Comparison of Attitude Toward

A *t*-test was used to compare levels of attitude toward LiveText between users and nonusers. From the *t*-test, it cannot be concluded that there is any difference between the groups, $t(57) = -0.67$ (nonusers: *M* = 1.42, *SD* = 0.53; users: *M* = 1.33, *SD* = 0.55).

Comparison of Perceived Organizational Support

A *t*-test was used to compare levels of perception of support between users and nonusers of LiveText. From the two-tailed *t*-test, it cannot be concluded that there is any difference between the groups, $t(57) = 0.34$. On average, nonusers displayed higher levels of perceived support than did users (nonusers: *M* = 2.70, *SD* = 0.58; users: *M* = 2.75, *SD* = 0.48).

Analysis of LiveText Use

Multiple regression analyses were conducted to determine the influence of MAM components on various facets of LiveText use such as (a) analysis of LiveText use frequency based on daily or weekly dates (AAU1), (b) analyses of use based on frequency over the semester (AAU2), and (c) how long LiveText is used during a session (AAU3). Only the users were measured.

Analysis of LiveText Frequency Based on Date

A standard multiple regression analysis was performed between the dependent variable (["I use LiveText … [with the response choices based on a number of days or weeks during a period of time]") and the independent variables (perceived organizational

support, perceived ease of use, perceived usefulness, and attitude toward). Analysis was performed using SPSS regression.

Regression analysis revealed that the model did not statistically significantly predict use of LiveText based on dates, $F(20) = 47.77$, $p < .05$. R^2 for the model was .78, and the adjusted R^2 for the model was .76, Figure 8 displays the standardized regression coefficients (β) for each variable.

In terms of individual relationships between the independent variables (perceived organizational support, perceived ease of use, perceived usefulness, and attitude toward LiveText) and the dependent variable (LiveText usage by date), perceived organizational support ($t = 0.05$, $p > .05$) and perceived ease of use ($t = 1.25$, $p > .05$) were not predictors of how often a user would use LiveText on a daily or weekly basis. Perceived usefulness ($t = 7.09$, $p < .05$) was a predictor of how often a user would use LiveText on a daily or weekly basis. Respondents who said they perceived LiveText as useful was more likely to use it. Interestingly, attitude toward LiveText ($t = -7.03$, $p < .05$) was an inverse predictor of how often a user would use LiveText on a daily or weekly basis. Many of the respondents who said they did not like LiveText used it more often than those who said they did like it.
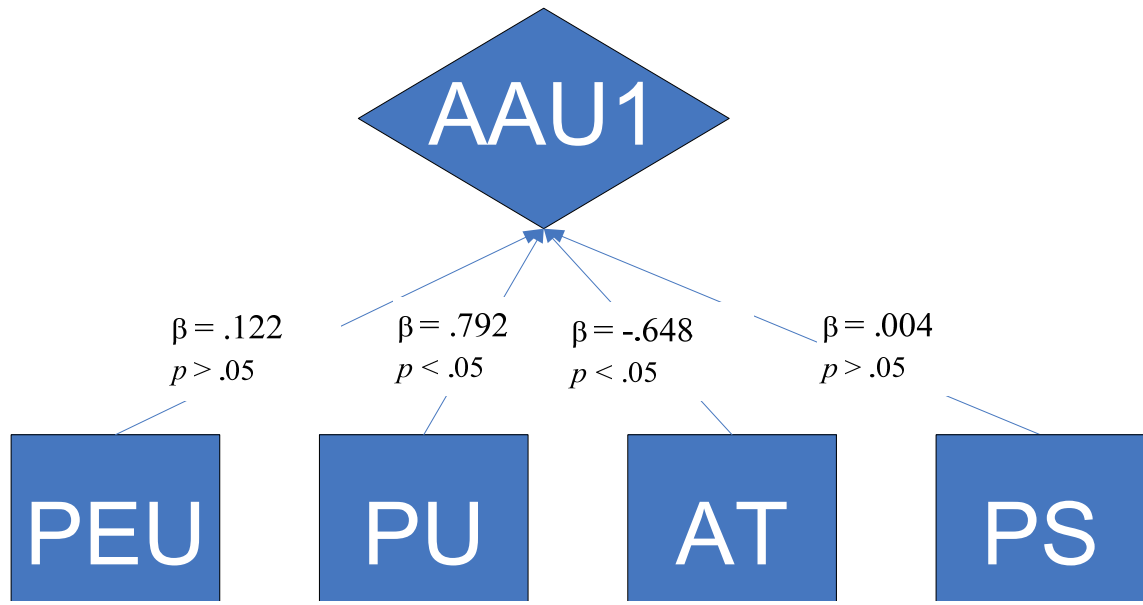
Figure 9: Relationship between variables of the MAM and LiveText usage by dates.

Analysis of LiveText Use Based Frequency During the Semester

A standard multiple regression analysis was performed between the dependent variable (["My LiveText use during the semester would include … [with response choices based on how often the user would use LiveText during a semester]") and the independent variables (perceived organizational support, perceived ease of use, perceived usefulness, and attitude toward LiveText). Analysis was performed using SPSS regression.

Regression analysis revealed that the model did not statistically significantly predict use of LiveText based on semester usage, $F(20) = 32.68$, $p < .05$. R^2 for the model was .71, and the adjusted R^2 for the model was .69. Figure 9 displays the standardized regression coefficients (β) for each variable.

In terms of individual relationships between the independent variables (perceived organizational support, perceived ease of use, perceived usefulness, and attitude toward LiveText) and the dependent variable (LiveText usage by date), perceived organizational

support ($t = 0.60$, $p > .05$) and perceived ease of use ($t = 0.64$, $p > .05$) were not predictors of how often a user would use LiveText throughout the semester. Perceived usefulness ($t = 6.16$, $p < .05$) and attitude toward ($t = -6.15$, $p < .05$) were predictors of how often a user would use LiveText throughout the semester.
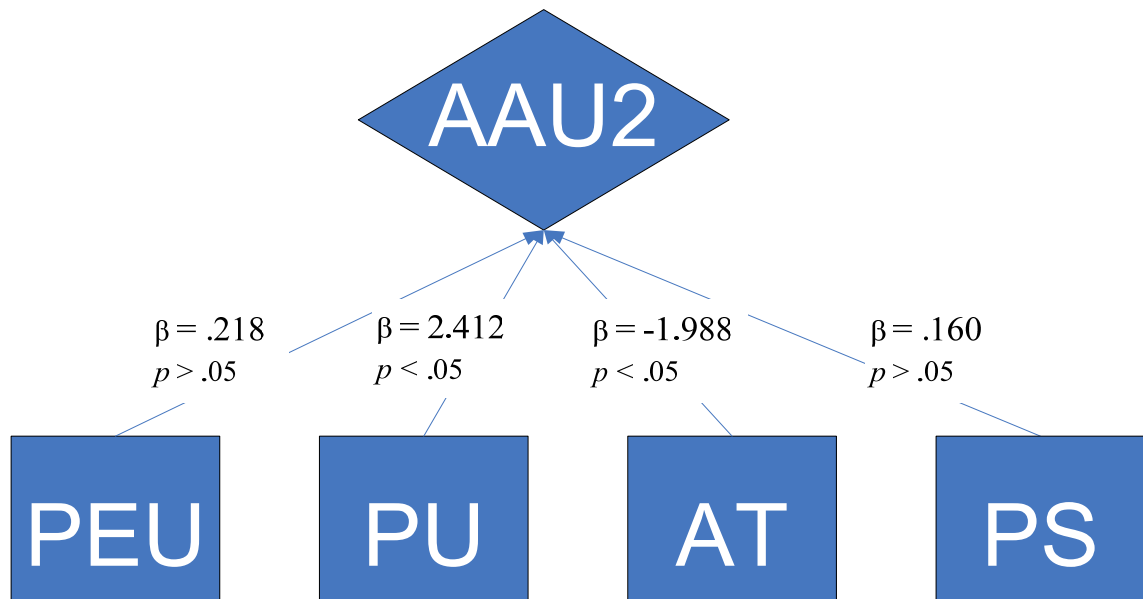
Figure 10: Relationships between variables of the MAM and the amount of LiveText use during a semester.

Analysis of LiveText Frequency Based on Duration

A multiple regression analysis was performed between the dependent variable ("I use LiveText for … [with choices based on a number of minutes or hours the user would use LiveText per session]") and the independent variables (perceived organizational support, perceived ease of use, perceived usefulness, and attitude toward LiveText). Analysis was performed using SPSS regression.

Regression analysis revealed that the model did not statistically significantly predict use of LiveText based on duration, $F(20) = 22.36$, $p < .05$. R^2 for the model was

.62, and the adjusted R^2 for the model was .60. Figure 10 displays the standardized regression coefficients (β) for each variable.

In terms of individual relationships between the independent variables (perceived organizational support, perceived ease of use, perceived usefulness, and attitude toward LiveText) and the dependent variable (LiveText use by duration), perceived organizational support ($t = -0.04$, $p > .05$), perceived ease of use ($t = 2.55$, $p < .05$), perceived usefulness ($t = 3.16$, $p < .05$), and attitude toward LiveText ($t = -4.77$, $p < .05$) were not predictors of how long a user would use LiveText in an average session.

AAU3

| β = .996 | β = 1.407 | β = -1.752 | β = -.013 |
| $p > .05$ | $p < .05$ | $p < .05$ | $p > .05$ |

PEU   PU   AT   PS
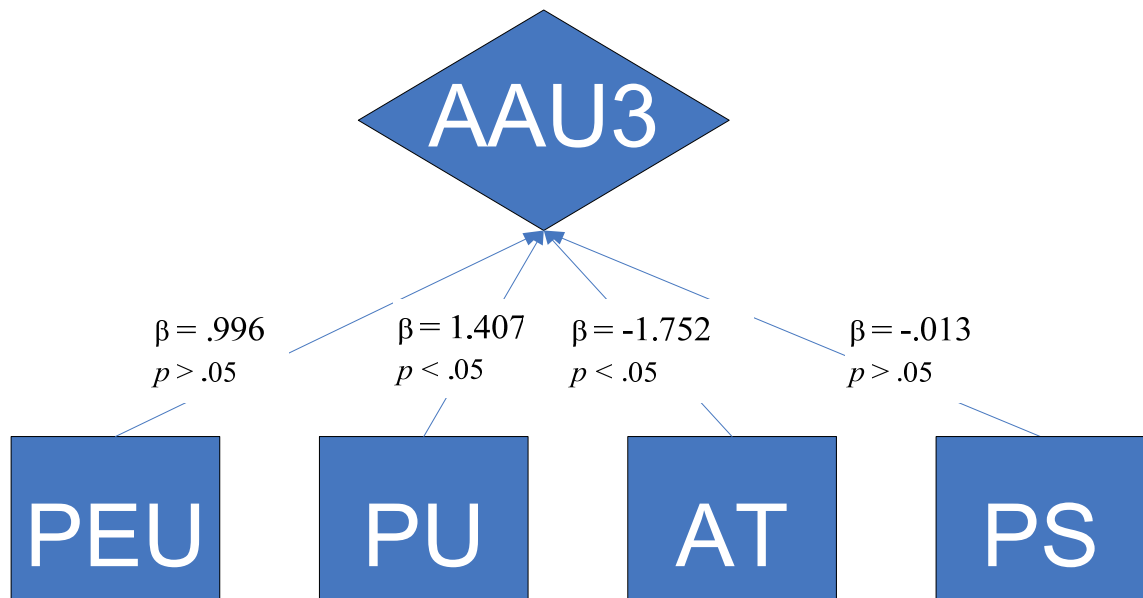
Figure 11: Relationship between variables of the MAM and frequency of LiveText use based on duration per session.

Frequency of Use for Each LiveText Function

Users of LiveText who were participants of the study ($n = 25$, see Table 5) were all familiar with the *electronic portfolio* (100%, $n = 25$).

Table 5

Familiarity With and Usage of LiveText Functions

Name of the function	Number of function users	Percentage of the sample
I am familiar with the Electronic Portfolio	25	100%
I am familiar with the Standards Stamper	12	48%
I am familiar with the Standards Library	13	52%
I am familiar with the Lesson Planner	19	76%
I am familiar with the Rubric Builder	22	88%
I am familiar with the Assessment Reporting Tools	15	60%
I am familiar with the Template Designation	15	60%
I am familiar with the Forms Function	8	32%
I am familiar with the Project Design	7	28%
I am familiar with the Share Function	20	80%
I am familiar with the Review Function	20	80%
I am familiar with the United Streaming Video Resources	8	32%
I am familiar with the Exhibit Center	10	40%
I use the Electronic Portfolio	22	88%
I use the Standards Stamper	7	28%
I use the Standards Library	8	32%
I use the Lesson Planner	7	28%
I use the Rubric Builder	11	44%
I use the Assessment Reporting Tools	8	32%
I use the Template Designation	6	24%
I use the Forms Function	7	28%
I use the Project Design	3	12%
I use the Share Function	16	64%
I use the Review Function	22	88%
I use the United Streaming Video Resources	2	8%
I use the Exhibit Center	5	20%

Users of LiveText who were participants of the study ($n = 25$) used the *electronic portfolio* (88%, $n = 22$), *Standards Stamper* (28%, $n = 7$), *Standards Library* (32%, $n = 8$), *Lesson Planner* (28%, $n = 7$), *Rubric Builder* (44%, $n = 11$), *Assessment Reporting Tools* (32%, $n = 8$), *Template Designation* (24%, $n = 6$), *Forms Function* (28%, $n = 7$); *Project Design* (12%, $n = 3$), *Share Function* (64%, $n = 16$), *Review Function* (88%, $n = 22$), *United Streaming Video Resources* (8%, $n = 2$), and the *Exhibit Center* (20%, $n = 5$).

Summary

The present inquiry concentrated on some of the relationships among perceived ease of use, perceived usefulness, perception of organizational support, attitude toward, and LiveText use as a predicted variable using the MAM. The MAM is an expanded version of the TAM, incorporating motivational elements inspired from a variety of models such as the CANE model of motivation. Data were collected in the Spring semester of 2007. Two surveys were used to measure perceptions of LiveText. One survey was for users and the other was for nonusers of LiveText. The users survey used nine scales for this study.

The first instrument was Perceived Utility of Computers and Technology and covered general views on technology in three items. The second instrument was Actual Use and asked the question "Do you use LiveText?" The third instrument was Perceived Usefulness and contained five items that measure how useful and valuable participants found LiveText. The Attitude Toward LiveText instrument measured how respondents feel emotionally toward LiveText and was measured in three items. The next instrument was Perceived Ease of Use, which used two items to compare participants' own technological capabilities (self-efficacy) to how difficult they thought LiveText was to use. This comparison between technological skills and respondents' perception of LiveText was used to measure ease of use. The Perceived Organizational Support instrument addressed two scales that cover the perception of organizational support toward faculty and students. This instrument used seven items to measure the professors' perceptions of how supportive the university is toward the professors' use and the successful implementation of LiveText and five items to measure the perceived usage of

LiveText by students. The Familiarity and Usage of LiveText Functions instrument addressed the respondents' proficiency of use. These 26 items were designed to measure which LiveText functions respondents were familiar with and which of these functions they regularly used. The LiveText usage scale was designed to measure respondents' frequency and duration of use, both daily and weekly and by semester. This scale was measured using the Amount of Actual Use instrument comprised of four items. Finally, the users survey has a Demographics instrument that measures personal characteristics using five items.

The nonusers survey and the users survey differ in that the nonusers survey used eight of the scales and six instruments and the users survey scale used nine scales and nine instruments. The nonusers survey used the following instruments: Perceived Utility of Computers and Technology, Actual Use, Perceived Organizational Support, and Demographics. The nonusers survey changed the items to address perceptions of LiveText without actual use, based on the information respondents had received regarding the programs. The Perceived Usefulness instrument included two items. The Attitude Toward LiveText Instrument included three items. The Perceived Ease of Use instrument included two items. Many of the analyses were done using similar questions between surveys. The following is an overview of the results of this study:

1. The MAM was successfully tested on professors' perception and use of LiveText.

2. Perception of organizational support and perceived ease of use were statistically significant predictors of LiveText use.

3. Perceived ease of use was a statistically significant predictor of professors liking LiveText.

4. Perceived ease of use was a statistically significant predictor of professors finding LiveText useful.

5. LiveText users had higher levels in believing that LiveText was useful, liking LiveText, and finding LiveText easier to use when compared to nonusers.

6. LiveText nonusers scored higher levels of perceived organizational support when compared to users of LiveText 7. The five stages of data analysis in this report included a test of reliability using Cronbach's alpha, testing dependent variables of the MAM using regression, comparing users and nonusers of LiveText on the variables of PEU, PS, AT, and PU using independent-sample *t*-tests, a recalculation of the TAM using actual-use variables compared to each variable in the MAM and how they influenced each other, and multiple regression analyses to determine the influence of MAM components on usage frequency and duration.

CHAPTER FIVE: CONCLUSION

Statement of the Problem

Technology continually sweeps the world in almost every facet of life, causing major restructuring and rethinking of how business is performed daily. New software packages confront employees in both academic and business environments on a perpetual basis. Employees must adapt and accept small changes such as new software versions and large changes such as new business processes intended to track workflow on a global scale between international customers and partners around the world.

In this study, the researcher successfully tested and used the MAM in a higher-education setting. The MAM was designed to measure employee beliefs regarding new technology and to locate the specific cause of resistance. It is hoped that understanding the causes of resistance will support future solutions to technology resistance and ultimately improve employee performance. The MAM was designed based on the TAM, a well-known model because it has been useful in predicting an end-user's acceptance or rejection of technology. The TAM was expanded to include motivational elements inspired by a variety of motivational research theories including the CANE model. The conclusion is that there is a great deal of resistance among faculty toward using LiveText. This research has been conceived as an applied report with the intention of locating causes of resistance, and as a side effect to recommend possible solutions that address the problem of faculty resistance to using LiveText.

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Purpose of the Study

The purpose of this study was to investigate the correspondence between faculty attitude toward the use of LiveText and their actual use of LiveText by using the MAM. This research was designed to survey faculty at a college of a large southeastern university and locate the specific causes of resistance to the implementation of LiveText for the benefit of the university administration.

Sample and Data Collection

A random sample was taken from a pool of instructors at the large southeastern university. Some respondents refused to participate and new respondents were surveyed based on a rerandomized selection. The respondents were contacted by email and letter to their campus mailbox requesting their cooperation in completing the survey. Respondents were asked whether or not they used LiveText and were given the appropriate survey in person. The surveys were returned to the author after the survey was completed and the surveys were securely handled. Data were collected over the Spring 2007 semester. A total of 59 professors participated on a voluntary basis, yielding a final response rate of 46.5% based on the population of professors scheduled to use LiveText.

Instrumentation

Instruments used in this study were Perceived Usefulness, Attitude Toward, Perceived Ease of Use, Organizational Support, Familiarity and Usage, Amount of Actual Use, and Demographics. These instruments were developed to cover the constructs of the MAM. This section further details how each instrument was used to test the hypotheses and various other points of interest in the study.

Design of the Study

Several analyses were conducted to understand the relationships between and among the MAM variables, actual use of LiveText, frequency and duration of LiveText use, and the differences and similarities between users and nonusers of LiveText. Regression analysis was used to explore the relationships between MAM variables and actual use to find patterns of predictability. *T*-tests were conducted between users and nonusers to locate differences and similarities between the two groups. Finally, frequency data on the use and familiarity of LiveText functions were collected.

Research Question and Hypotheses

The research question for this study was "What are the relationships between the components of the MAM?" From this research study, the following hypotheses and conclusions were derived.

H_1: An increase in positive attitude toward, perceived usefulness, perceived ease of use, and perception of organizational support toward LiveText will result in a statistically significant increase in the use of LiveText.

H_2: An increase in perceived ease of use and perception of organizational support toward using LiveText will result in a statistically significant increase in liking LiveText.

H_3: An increase in perceived ease of use and perceived organizational support of LiveText will result in a statistically significant increase in the perceived usefulness of LiveText.

Discussion

This section presents conclusions of the study and their significance by hypothesis (intended to answer the research question), a comparison of users and nonusers based on variables, an analysis of LiveText use based on frequency and duration, and an analysis on the frequency of use and familiarity with LiveText functionality.

Hypothesis 1

An increase of positive attitude toward, perceived usefulness, perceived ease of use, and perception of organizational support toward LiveText will result in a statistically significant increase in the use of LiveText.

The hypothesis outlines a belief that if the respondents liked LiveText more, thought that LiveText was more useful, thought that LiveText was easier to use, and felt that the administration was more supportive in the implementation, encouraging professors to use LiveText in a positive manner, then more professors would be using LiveText. The results of this study indicate perceived usefulness and attitude toward LiveText were each strong determinants of whether or not professors used LiveText. Therefore, the large southeastern university administration should focus efforts on encouraging positive attitudes regarding implementing LiveText and the concept that LiveText is useful.

The study concurs with the literature stating that perceived usefulness is a strong determinant of actual use. The MAM expands many traditional models such as the TAM to include attitude toward the software. The literature supports many of the reasons why perceived usefulness and attitude toward LiveText were predictors of actual use. The literature supports attitude as a determining factor in the acceptance of technology

because positive interactions and opinions toward something generate tremendous meaning. Attitude toward a software product and finding it useful are interrelated because one will generally like a tool that one finds useful. If someone feels that LiveText is useful, then they will tend to like LiveText more.

A finding in this study that was also consistent with the literature was that perceived support was not statistically significant. There could be many reasons for this. Shared organizational beliefs can have a positive or negative impact on employees. Premkumar and Potter (1995) wrote about the negative effects political and social dynamics can have on the introduction of new ideas. In the same way, organizations can encourage or discourage the use of LiveText between employees.

Hypothesis 1 adds new insight to research in instructional technology because it recognizes the impact of perceived usefulness and attitude as a strong influence on employees when compared to organizational support. This finding could assist organizations in the future that could focus more resources on demonstrating the usefulness and positive benefits of new ideas and technologies than on how easy the software is to use or enforcing organizational pressure on individuals.

Hypothesis 2

An increase in perceived ease of use and perception of organizational support toward using LiveText will result in a statistically significant increase in liking LiveText.

The hypothesis explores the idea that if a professor perceives the university administration to be more supportive of the implementation of LiveText and the professor develops stronger feelings that LiveText is easy to use, then the professor will like

LiveText more. The research indicates that perceived organizational support and perceived ease of use are not determinants in how well professors will like LiveText.

Hypothesis 1 focused on the influence of the variables in the MAM and how they impacted actual use. Hypothesis 2 focuses on how well employees liked LiveText. Organizational support did not play a statistically significant role in feelings toward LiveText. This finding is supported by the literature because attitudes and emotions are what the user brings to a task. Organizational support may encourage people to use or reject the technology, but it doesn't necessary mean that the user will like the technology even if they are encouraged or forced to use it. Perceived ease of use did not strongly impact how well a respondent liked the new software. From the perspective of an employee facing new technology, they may feel they will have to use a technology because everyone is using it or reject a technology because everyone is rejecting it. This will not mean that they will like it or dislike it as a result of how their peers feel. Perceived ease of use occurs when the employee must decide on an individual level the amount effort and energy a new system requires (Davis, 1993). The presumption of expended energy is an individual choice as is the decision to like something or dislike it.

As did Hypothesis 1, Hypothesis 2 indicates that the university should focus on concerns other than promoting how easy the software is to use and the level of support by the organization, if the goal is to influence professors' feelings about LiveText.

Hypothesis 3

An increase in perceived ease of use and perceived organizational support of LiveText will result in a statistically significant increase in the perceived usefulness of LiveText.

This hypothesis states that if a professor perceives an increase in support from the university in the implementation of LiveText and the professor feels that LiveText is easier to use, then the professor will find LiveText to be a more useful tool. According to the research, perceived organizational support was not a statistically significant predictor of whether professors find LiveText useful. Perceived ease of use was a strong predictor in the MAM and would have a strong impact on how useful a professor thought LiveText is or would be to use (depending on whether they were currently using LiveText).

Hypothesis 3 is supported by the literature because it elaborates that finding something useful is similar to liking something because it is an individual choice as opposed to pressure employees may receive from the organization. Eccles and Wigfield (1995) described the elements of task value as attainment, intrinsic, cost belief, and extrinsic. When applying these elements to this study, the professor using LiveText does not tie his identity to using LiveText (attainment), does not get any intrinsic reward from using LiveText (intrinsic), may or may not see value in using resources such as the time or energy to learn about LiveText (cost belief), and may not find any real value in the functions LiveText provides (extrinsic).

The literature supports the notion that people who find a tool easier to use will also find it more useful. It is also important to note that many organizations push the notion that the level of usefulness is something that can be taught or encouraged on a group level using instructors, training courses, peer pressure, or interoffice advertisement (such as flyers in the mailbox or email). The challenge is that the usefulness of a tool or idea is an individual determination. The research could suggest that since perceived organizational support does not significantly impact how useful an employee finds

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software, then the organization could attempt to foster the idea of usefulness by understanding the personal needs and values of each employee and explaining how the software fits with those values as a beneficial and easy-to-use tool instead of continually reinforcing the software as a requirement sent down from higher administration.

Comparison of Users and Nonusers

The reason *t*-tests were conducted comparing users and nonusers is because much of the prevailing literature focuses research on one sample. The sample is usually people who are currently using the software or people who have not used the software. The goal of this research was to take a snapshot of how the current population views LiveText. This population includes professors who are currently using LiveText and those who have openly rejected LiveText (actively) or who have not attended the training or not used LiveText for various other reasons (passively) such as they do not have the time, energy, or skill sets. It is important to understand the differences and similarities between users and nonusers to further understand the causes of technology acceptance and rejection. The research indicates that there is a statistically significant difference in the perception of usefulness between those who use LiveText and those who do not in that users felt that LiveText was more useful. This would be a logical conclusion because people who are not using LiveText currently are likely to feel that it is not a useful enough tool to spend the time learning and implementing into their courses and daily activities.

Another difference between users and nonusers was that users seem to perceive LiveText as easier to use than nonusers, many of whom have never tried LiveText. There are many possible reasons why users liked LiveText more than nonusers. Nonusers may

have heard negative comments about the software. Users may have had the same misgivings about LiveText until they tried using it. There are many suppositions that can be made about the differences between the liking of new software between users and nonusers.

Analysis of the Actual Use Variables

Regression analyses were conducted between the variables of the MAM and actual use variables such as "How often do you use LiveText … (with the response choices based on a number of days or weeks during a period of time)," "My use of LiveText during the semester would include … (with response choices based on how often the user would use LiveText during a semester)," and "I use LiveText for … (with response choices based on a number of minutes or hours the user would use LiveText for a session)." The questions were focused on the users of LiveText. According to the research, the statistically significant predictors for all of the usage variables were perceived usefulness and attitude toward LiveText. This shows that the amount of time and the frequency with which a professor used LiveText were based on how useful they thought LiveText was and how much they liked it.

Frequency of Use and Familiarity with LiveText Functions

Respondents were asked if they were familiar with and used a variety of functions in LiveText. Many of the respondents were familiar with the functions of LiveText and used only a small number of functions to a great degree. This indicates that participants are either unaware of a variety of features or they do not find these features useful. The large southeastern university may want to consider providing more training on these

rarely used functions. Providing information on other uses of LiveText could increase the actual use by professors. If it is determined that the functions are not useful or necessary, they should be eliminated from the design features.

Significance of the Findings

This study is important and necessary to conduct because there is tremendous resistance to new technology in many organizations around the world. For organizations such as universities and businesses to function, their employees must stay competitive with modern technologies and resources. The current literature on resistance to technology and solutions such as the TAM often ignores motivational elements that are fundamental to the employee's decision on whether to embrace a new technology. The MAM was developed to blend successfully tested theories on technology acceptance with fundamental motivational concepts to expand the literature on ways to successfully implement new technology in corporations. The MAM was tested on faculty at a college in a large southeastern university in this applied research study to find solutions to low acceptance of LiveText. Some possible solutions such as increasing perceptions of how easy LiveText is to use and increasing the positive support and commitment by administration in the implementation of LiveText may increase acceptance of LiveText, and thus reduce resistance to new technologies.

Limitations

Limitations impacted this study in certain aspects. This study was focused on one particular university. The author used a sample of convenience. The results may or may not apply to other organizations and this has an impact on external validity. More

research must take place on user resistance to new technologies. Internal validity may have been hindered since there was a great deal of resistance on the part of professors to fill out the surveys due to active resistance (where they would directly say "no") and passive resistance (where they would give excuses such as "I don't have the time"). Respondents could have had biased or unresponsive opinions based on the structure of the survey. Incorporating qualitative research techniques such as case studies and anecdotal reporting could improve consistency in future studies.

<div align="center">Further Research Recommendations</div>

1. Apply the MAM to corporate settings, other universities, and other types of organizations to measure the introduction of technology and the level of acceptance by new users.

2. Test the MAM on larger sample sizes.

3. Test the MAM using different types of software to measure if the type of software has an impact on levels of resistance.

4. Test the MAM on more diverse populations (different ages, ethnicities, locations) to see if there are differences in technological acceptance based on personal characteristics.

Recommendations to the Faculty Participants and Administration

The research shows that there is an inverse relationship between the end user's perceived usefulness and the actual use of LiveText. In simpler terms, the more a faculty member uses LiveText, the less useful they find it. This flags a strong warning and numerous questions that the university should address because they may be the key to why some employees resist implementation of LiveText. There may be challenges to the software such as difficult interfaces, slow response time, or other repairable issues that the administration could address. Another challenge may be the responsibilities associated with the software. The research also shows that the organization was not a significant predictor for LiveText usage. The lack of organizational influence should be thoroughly researched because a positive relationship with the organization and end user will provide a smoother software implementation than a demanding or draconian environment where software implementation becomes a forced responsibility. The research also showed positive attitudes as a predictor. Perceptions of organizational support can change with proper positive motivators such as rewards for early adopters and praise for using the system.

Attitude was a strong predictor for use of LiveText. Further research into the early and positive adaptors may show patterns of use that can be shared with other users. If positive users have techniques or habits associated with the software, they can share these new techniques and provide a more positive environment for other users. Perceived ease of use was a predictor for how useful employees thought LiveText was. Further research could determine why end users may perceive LiveText as difficult or easy and provide

information to address perceived facts and myths about its implementation. All of the factors mentioned can provide a positive environment for the implementation of LiveText by customizing an instructor-led and web-based program with supporting publications. A solution to resistance can be found by addressing the areas of concern through continued research and by applying the results to new solution initiatives.

APPENDIX A: SURVEY FOR USERS OF LIVETEXT

LiveText Survey
For Users of LiveText

Instructions

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

1 = I **Strongly Disagree** with this statement
2 = I **Disagree** with this statement
3 = I **Neither Agree nor Disagree** with this statement
4 = I **Agree** with this statement
5 = I **Strongly Agree** with this statement
N/A = **Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
1. I use the computer to solve complex tasks.	1	2	3	4	5	N/A
2. I think that computers are easy to use.	1	2	3	4	5	N/A
3. I do not use technology as an instructional tool. *	1	2	3	4	5	N/A
4. I use LiveText.		YES			NO	
5. I find LiveText useful.	1	2	3	4	5	N/A
6. LiveText increases my productivity.	1	2	3	4	5	N/A
7. LiveText meets job-related needs.	1	2	3	4	5	N/A
8. LiveText reduces the time I spend on unproductive tasks.	1	2	3	4	5	N/A
9. LiveText improves the quality of my work.	1	2	3	4	5	N/A
10. LiveText is beneficial.	1	2	3	4	5	N/A
11. LiveText is positive.	1	2	3	4	5	N/A
12. All things considered, my using LiveText is good.	1	2	3	4	5	N/A
13. LiveText is easy to use.	1	2	3	4	5	N/A
14. Learning to use LiveText was easy for me.	1	2	3	4	5	N/A
15. I often become confused when I use LiveText.*	1	2	3	4	5	N/A
16. Interacting with LiveText requires a lot of mental effort.*	1	2	3	4	5	N/A

* This response was measured on an inverse scale

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
17. I have contacted online or tech support when I use LiveText. *	1	2	3	4	5	N/A
18. Although it may be helpful, using LiveText is certainly not compulsory in my job. *	1	2	3	4	5	N/A
19. I was offered training to use LiveText.	1	2	3	4	5	N/A
20. My immediate supervisor uses LiveText.	1	2	3	4	5	N/A
21. My immediate supervisor encourages me to use LiveText.	1	2	3	4	5	N/A
22. My supervisor does not require me to use LiveText. *	1	2	3	4	5	N/A
23. My use of LiveText is voluntary. *	1	2	3	4	5	N/A
24. People who are important to me think I should use LiveText.	1	2	3	4	5	N/A
25. My students have the resources and help they need to use LiveText.	1	2	3	4	5	N/A
26. My students find LiveText useful.	1	2	3	4	5	N/A
27. My students find LiveText easy to use.	1	2	3	4	5	N/A
28. My students are good at technology.	1	2	3	4	5	N/A
29. My students like LiveText.	1	2	3	4	5	N/A

* This response was measured on an inverse scale

I am familiar with the following LiveText Functions		
30. Electronic Portfolio	YES	NO
31. Standards Stamper	YES	NO
32. Standards Library	YES	NO
33. Lesson Planner	YES	NO
34. Rubric Builder	YES	NO
35. Assessment Reporting Tools	YES	NO
36. Template Designation	YES	NO
37. Forms Function	YES	NO
38. Project Design	YES	NO
39. Share Function	YES	NO
40. Review Function	YES	NO
41. United Streaming Video Resources	YES	NO
42. Exhibit Center	YES	NO

I use the following LiveText Functions		
43. Electronic Portfolio	YES	NO
44. Standards Stamper	YES	NO

I use the following LiveText Functions		
45. Standards Library	YES	NO
46. Lesson Planner	YES	NO
47. Rubric Builder	YES	NO
48. Assessment Reporting Tools	YES	NO
49. Template Designation	YES	NO
50. Forms Function	YES	NO
51. Project Design	YES	NO
52. Share Function	YES	NO
53. Review Function	YES	NO
54. United Streaming Video Resources	YES	NO
55. Exhibit Center	YES	NO

Please select one response to the following questions:

56. I use LiveText:

Less than once a week
About once a week
2 or 3 times a week
4 to 6 times a week
about once a day
several times a day

57. My LiveText use during the semester would include:

More than twenty times a semester
Ten to twenty times a semester
Five to nine times a semester
One to four times a semester

58. When I use LiveText, I usually use it for:

Less than 15 minutes
Between 15 and 30 minutes
Between 31 and 45 minutes
Between 46 and 60 minutes
More than 60 minutes

Please circle one response to the following questions:		
59.	What is your age?	
	20–30	
	31–40	
	41–50	
	51–60	
	Above 60	
60.	What is your gender?	
	Male	
	Female	
61.	How long have you worked in this field?	
	Less than 1 year	
	1 to 3 years	
	4 to 6 years	
	Over 6 years	
62.	How long have you been affiliated with this university?	
	Less than 1 year	
	1 to 3 years	
	4 to 6 years	
	Over 6 years	
63.	What is your race?	
	Asian	
	Black	
	Hispanic	
	American Indian	
	Non-Resident Alien	
	White	
	No Response	
Thank you for taking part in this survey!		

APPENDIX B: SURVEY FOR NONUSERS OF LIVETEXT

LiveText Survey

For Nonusers of LiveText

Instructions

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

1 = I **Strongly Disagree** with this statement
2 = I **Disagree** with this statement
3 = I **Neither Agree nor Disagree** with this statement
4 = I **Agree** with this statement
5 = I **Strongly Agree** with this statement
N/A = **Not Applicable**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
1. I use the computer to solve complex tasks.	1	2	3	4	5	N/A
2. I think that computers are easy to use.	1	2	3	4	5	N/A
3. I do not use technology as an instructional tool. *	1	2	3	4	5	N/A
4. I use LiveText.		YES			NO	

* This response was measured on an inverse scale

The following questions are designed to learn what you have heard about LiveText from others. Please answer them to the best of your ability.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
5. Although it may be helpful, using LiveText is certainly not compulsory in my job. *	1	2	3	4	5	N/A
6. I was offered training to use LiveText.	1	2	3	4	5	N/A
7. My immediate supervisor uses LiveText.	1	2	3	4	5	N/A

* This response was measured on an inverse scale

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
8. My immediate supervisor encourages me to use LiveText.	1	2	3	4	5	N/A
9. My supervisor does not require me to use LiveText. *	1	2	3	4	5	N/A
10. My use of LiveText is voluntary. *	1	2	3	4	5	N/A
11. People who are important to me think I should use LiveText.	1	2	3	4	5	N/A
12. I would find LiveText useful in my job.	1	2	3	4	5	N/A
13. Using LiveText would increase my productivity.	1	2	3	4	5	N/A
14. Using LiveText would be beneficial.	1	2	3	4	5	N/A
15. Using LiveText would be positive.	1	2	3	4	5	N/A
16. I think I would like using LiveText.	1	2	3	4	5	N/A
17. I think it would be easy for me to learn how to use LiveText.	1	2	3	4	5	N/A
18. I think I would be good at using LiveText.	1	2	3	4	5	N/A
19. My students have the resources and help they need to use LiveText.	1	2	3	4	5	N/A
20. My students find LiveText useful.	1	2	3	4	5	N/A
21. My students find LiveText easy to use.	1	2	3	4	5	N/A
22. My students are good at technology.	1	2	3	4	5	N/A
23. My students like LiveText.	1	2	3	4	5	N/A

* This response was measured on an inverse scale

Please circle one response to the following questions:

24. What is your age?

    20–30
    31–40
    41–50
    51–60
    Above 60

25. What is your gender?

    Male
    Female

26.	How long have you worked in this field? Less than 1 year 1 to 3 years 4 to 6 years Over 6 years
27.	How long have you been affiliated with this university? Less than 1 year 1 to 3 years 4 to 6 years Over 6 years
28.	What is your race? Asian Black Hispanic American Indian Non-Resident Alien White No Response
	Thank you for taking part in this survey!

APPENDIX C: PERCEIVED UTILITY OF COMPUTERS AND TECHNOLOGY
INSTRUMENT

INSTRUCTIONS

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

1 = I **Strongly Disagree** with this statement
2 = I **Disagree** with this statement
3 = I **Neither Agree nor Disagree** with this statement
4 = I **Agree** with this statement
5 = I **Strongly Agree** with this statement
N/A = **Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: These items were on both surveys

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
1. I use the computer to solve complex tasks.	1	2	3	4	5	N/A
2. I think that computers are easy to use.	1	2	3	4	5	N/A
3. I do not use technology as an instructional tool. *	1	2	3	4	5	N/A
4. I use LiveText.		YES			NO	

* This response was measured on an inverse scale

APPENDIX D: PERCEIVED USEFULNESS INSTRUMENT

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

1 = I **Strongly Disagree** with this statement
2 = I **Disagree** with this statement
3 = I **Neither Agree nor Disagree** with this statement
4 = I **Agree** with this statement
5 = I **Strongly Agree** with this statement
N/A = **Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: These items are specifically from the Users Survey

5.	I find LiveText useful.	1	2	3	4	5	N/A
6.	LiveText increases my productivity.	1	2	3	4	5	N/A
7.	LiveText meets job-related needs.	1	2	3	4	5	N/A
8.	LiveText reduces the time I spend on unproductive tasks.	1	2	3	4	5	N/A
9.	LiveText improves the quality of my work.	1	2	3	4	5	N/A

Note: These items are specifically from the Nonusers Survey

12.	I would find LiveText useful in my job.	1	2	3	4	5	N/A
13.	Using LiveText would increase my productivity.	1	2	3	4	5	N/A
14.	Using LiveText would be beneficial.	1	2	3	4	5	N/A

APPENDIX E: PERCEIVED EASE OF USE INSTRUMENT

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

1 = I **Strongly Disagree** with this statement
2 = I **Disagree** with this statement
3 = I **Neither Agree nor Disagree** with this statement
4 = I **Agree** with this statement
5 = I **Strongly Agree** with this statement
N/A = **Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: These items are specifically from the Users Survey

13. LiveText is easy to use.	1	2	3	4	5	N/A
14. Learning to use LiveText was easy for me.	1	2	3	4	5	N/A
15. I often become confused when I use LiveText. *	1	2	3	4	5	N/A
16. Interacting with LiveText requires a lot of mental effort.*	1	2	3	4	5	N/A

* This response was measured on an inverse scale
Note: These items are specifically from the Nonusers Survey

17. I think it would be easy for me to learn how to use LiveText.	1	2	3	4	5	N/A
18. I think I would be good at using LiveText.	1	2	3	4	5	N/A

APPENDIX F: ATTITUDE TOWARD LIVETEXT INSTRUMENT

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

1 = I **Strongly Disagree** with this statement
2 = I **Disagree** with this statement
3 = I **Neither Agree nor Disagree** with this statement
4 = I **Agree** with this statement
5 = I **Strongly Agree** with this statement
N/A = **Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: These items are specifically from the Users Survey

10. LiveText is beneficial.	1	2	3	4	5	N/A
11. LiveText is positive.	1	2	3	4	5	N/A
12. All things considered, my using LiveText is good.	1	2	3	4	5	N/A

Note: These items are specifically from the Nonusers Survey

14. Using LiveText would be beneficial.	1	2	3	4	5	N/A
15. Using LiveText would be positive.	1	2	3	4	5	N/A
16. I think I would like using LiveText.	1	2	3	4	5	N/A

APPENDIX G: PERCEIVED ORGANIZATIONAL SUPPORT INSTRUMENT

Please circle one answer for each statement below. For questions that require a response 1 through 5 or N/A, use the following scale:

> **1** = I **Strongly Disagree** with this statement
> **2** = I **Disagree** with this statement
> **3** = I **Neither Agree nor Disagree** with this statement
> **4** = I **Agree** with this statement
> **5** = I **Strongly Agree** with this statement
> **N/A** = **Not Applicable**

For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: These items were on the Users and Nonusers Surveys

5.	Although it may be helpful, using LiveText is certainly not compulsory in my job. *	1	2	3	4	5	N/A
6.	I was offered training to use LiveText.	1	2	3	4	5	N/A
7.	My immediate supervisor uses LiveText.	1	2	3	4	5	N/A
8.	My immediate supervisor encourages me to use LiveText.	1	2	3	4	5	N/A
9.	My supervisor does not require me to use LiveText. *	1	2	3	4	5	N/A
10.	My use of LiveText is voluntary. *	1	2	3	4	5	N/A
11.	People who are important to me think I should use LiveText.	1	2	3	4	5	N/A

* This response was measured on an inverse scale

17.	I have contacted online or tech support when I use LiveText. *	1	2	3	4	5	N/A
18.	Although it may be helpful, using LiveText is certainly not compulsory in my job. *	1	2	3	4	5	N/A
19.	I was offered training to use LiveText.	1	2	3	4	5	N/A
20.	My immediate supervisor uses LiveText.	1	2	3	4	5	N/A
21.	My immediate supervisor encourages me to use LiveText.	1	2	3	4	5	N/A
22.	My supervisor does not require me to use LiveText. *	1	2	3	4	5	N/A
23.	My use of LiveText is voluntary. *	1	2	3	4	5	N/A
24.	People who are important to me think I should use LiveText.	1	2	3	4	5	N/A
25.	My students have the resources and help they need to use LiveText.	1	2	3	4	5	N/A
26.	My students find LiveText useful.	1	2	3	4	5	N/A
27.	My students find LiveText easy to use.	1	2	3	4	5	N/A
28.	My students are good at technology.	1	2	3	4	5	N/A
29.	My students like LiveText.	1	2	3	4	5	N/A

* This response was measured on an inverse scale

APPENDIX H: ACTUAL USE INSTRUMENT

Instructions

Please circle one answer for each statement below. For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: This item was on both surveys

4. I use LiveText.	YES	NO

APPENDIX I: FAMILIARITY AND USAGE OF LIVETEXT FUNCTIONS
INSTRUMENT

Please circle one answer for each statement below. For questions that require a YES or NO answer, circle YES if you agree with the statement or NO if you disagree with the statement.

Note: These items were only on the Users Survey

30.	Electronic Portfolio	YES	NO
31.	Standards Stamper	YES	NO
32.	Standards Library	YES	NO
33.	Lesson Planner	YES	NO
34.	Rubric Builder	YES	NO
35.	Assessment Reporting Tools	YES	NO
36.	Template Designation	YES	NO
37.	Forms Function	YES	NO
38.	Project Design	YES	NO
39.	Share Function	YES	NO
40.	Review Function	YES	NO
41.	United Streaming Video Resources	YES	NO
42.	Exhibit Center	YES	NO

I use the following LiveText Functions			
43.	Electronic Portfolio	YES	NO
44.	Standards Stamper	YES	NO
45.	Standards Library	YES	NO
46.	Lesson Planner	YES	NO
47.	Rubric Builder	YES	NO
48.	Assessment Reporting Tools	YES	NO
49.	Template Designation	YES	NO
50.	Forms Function	YES	NO
51.	Project Design	YES	NO
52.	Share Function	YES	NO
53.	Review Function	YES	NO
54.	United Streaming Video Resources	YES	NO
55.	Exhibit Center	YES	NO

APPENDIX J: AMOUNT OF ACTUAL USE INSTRUMENT

Please circle one answer for each statement below.

Note: These items were only on the Users Survey

Please select one response to the following questions:
56. I use LiveText: Less than once a week About once a week 2 or 3 times a week 4 to 6 times a week about once a day several times a day
57. My LiveText use during the semester would include: More than twenty times a semester Ten to twenty times a semester Five to nine times a semester One to four times a semester
58. When I use LiveText, I usually use it for: Less than 15 minutes Between 15 to 30 minutes Between 31 and 45 minutes Between 46 and 60 minutes More than 60 minutes

APPENDIX K: DEMOGRAPHICS INSTRUMENT

Please circle one answer for each statement below.

Note: These items were in both User and Nonuser Survey

Please circle one response to the following questions:
24. What is your age?   20–30   31–40   41–50   51–60   Above 60
25. What is your gender?   Male   Female
26. How long have you worked in this field?   Less than 1 year   1 to 3 years   4 to 6 years   Over 6 years
27. How long have you been affiliated with this university?   Less than 1 year   1 to 3 years   4 to 6 years   Over 6 years
28. What is your race?   Asian   Black   Hispanic   American Indian   Non-Resident Alien   White   No Response
Thank you for taking part in this survey!

APPENDIX L: UCF INSTITUTIONAL REVIEW BOARD PERMISSION LETTER

January 9, 2007

Daniel M. Siegel
2809 Sprague Drive
Orlando, FL 32826

Dear Mr. Siegel:

With reference to your protocol #06-4052 entitled, "Accepting Technology and Overcoming Resistance to Change Using a New Motivational Model Inspired by the Commitment and Necessary Effort and Technology Acceptance Model," I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved on 1/09/2007. The expiration date for this study will be 1/08/2008.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator.

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Joanne Muratori
UCF IRB Coordinator
(FWA00000351 Exp. 5/13/07, IRB00001138)

Copies: IRB File
Stephen Sivo, Ph.D.

JM:jm

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