THE EFFECT OF GETTING THINGS DONE SOFTWARE ON THE MOTIVATION AND SELF-REGULATION OF PRESERVICE TEACHERS IN AN INTRODUCTORY EDUCATIONAL TECHNOLOGY COURSE

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Abstract: The purpose of this study was to investigate the effect of *Getting Things Done* ™ (GTD) software on the motivation and self-regulation of pre-service teachers in an introductory Educational Technology course. *Getting Things Done*™ software has the potential to provide pre-service teachers with a positive influence on their personal growth in relation to their accomplishments in the course. This dissertation attempts to integrate an examination of motivation and self-regulation for pre-service teachers with the use of *Getting Things Done*™ software. The study was a concurrent mixed methods study, employing both quantitative and qualitative measures, to determine and ascertain the differences in motivation and self-regulation between comparison groups. Comparison groups consisted of eight intact sections of the Educational Technology course, randomly divided into equal numbers of experimental and control groups. The Motivated Strategies for Learning Questionnaire (MSLQ) and a researcher developed, Likert-type scale, were utilized for the pre- and post-test component of the study. Additional qualitative data was collected through interviews with eight randomly selected participants from the experimental groups at the end of the study. Paired sample t-tests, independent samples t-tests, and Pearson bivariate correlations were conducted on the quantitative data. The qualitative interviews were transcribed and analyzed for themes. Significant results were discovered in both the experimental control groups for the MSLQ subscales and the Likert-type data. As a result, alternative causes for significance were considered. The number of significant results in both groups point to unexpected consequences via an unintentional cause. It is believed that there were statistically significant changes in both groups because course instructors for the experimental groups and the control groups modeled the components of GTD via their use of the online course platform, Desire2Learn (D2L), for calendaring, reminders, and course materials, which closely mimicked the components of the GTD software for all of the classes. Therefore, due to course structure, all students were provided with information and tools to stay connected to and on top of course material via the online course platform and were not forced to seek out alternative methods to stay organized.

TABLE OF CONTENTS

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

Table Page

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

The world of technology is constantly changing and evolving. Those teaching others to use technology are in a continual struggle to balance existing programs and applications with newly released products. A further challenge exists for teacher educators in technology preparation courses. Not only do these educators instruct pre-service teachers in how to use these programs and the appropriate application of the technology, but also they must educate these future teachers on ways in which technology can be effectively integrated into K-12 classroom environments.

Unfortunately, the overwhelming number of programs and applications to be taught in these courses can put a strain on pre-service teachers. Tarafdar et al. (2007) found that *technostress* or stress from too much computer technology can cause overload, privacy invasion, inability to deal with the complexities of the technology, and lead to a fear of technology. Aoki and Downes (2003) discovered that students struggle when they endeavor to manipulate more technology than they think they can handle.

Balancing technology and coursework assignments in the classroom is difficult for many students. Learning to use new programs and staying current with course assignments can be daunting tasks. Trying to balance coursework, technology instruction, and future technology implementation may be an overwhelming process for

for pre-service teachers. Kinzie (1990) notes "for learners to be effective, they must be able to make appropriate instructional choices based on effective learning strategies, and they must be motivated by a desire to learn" (p. 6). Kinzie also believes that learners who use self-regulated learning methods will demonstrate better ongoing motivation to learn.

Zimmerman (2008) states that current research should focus on the ways motivational feelings and beliefs of students influences their ability to begin and sustain changes in self-regulation of learning. Additionally, Dexter, Doering, and Riedel (2006) contend that while National Educational Technology Standards for Teachers have been implemented in higher education programs, pre-service teachers need opportunities to learn to use technology. Topper (2004) discovered that pre-service teachers graduating from a teacher education program did not have the confidence or capability to utilize basic technology in their own classrooms. College students face a variety of obstacles to successfully complete their coursework including, competing demands from different courses, lack of personal confidence in their ability to accomplish tasks, and insufficient knowledge in applying technological applications to help with assignments. This research study attempted to address several of these issues for pre-service teachers in an introductory Educational Technology course.

Purpose of study

The purpose of this study was to investigate the effect of *Getting Things Done* ™ (GTD) software on the motivation and self-regulation of pre-service teachers in an introductory Educational Technology course. The researcher hypothesized pre-service teachers who used GTD software would demonstrate a greater increase in motivation and

self-regulation scores on the Motivated Strategies Learning Questionnaire (MSLQ) than pre-service teachers who did not utilize the GTD software.

Research question

The research question guiding this current study was: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation?

Statement of the Problem

Randi (2004) believes that self-regulated learning strategies are essential skills for teachers to develop. Randi suggests one way to develop self-regulation skills is to provide related learning experiences. To explore how the motivation and self-regulation of pre-service teachers is affected by *Getting Things Done*™ software, a related learning experience was presented to students in the experimental groups. According to Self-Determination Theory (Ryan & Deci, 2002), people have the natural tendency to pursue challenges and ascertain new perspectives due to an innate desire to expand their interests. The authors go on to say that broadening personal capacities as well as conveying talents and inclinations is part of actualizing their human potential. Self-Determination Theory was utilized as a foundation for this research and will be briefly discussed.

Theoretical Approach: Self-Determination Theory

Self-Determination Theory (SDT) is "an organismic-dialectical theory that views human beings as proactive organisms whose natural or intrinsic functioning can be either facilitated or impeded by the social context" (Deci et al., 1994, p. 120). The organismic framework in this theory demonstrates that humans seek growth, challenges and self-

actualization to become successful. The dialectic interface in this theory holds that actualization is at one end of the spectrum and the social environment is at the other; one end or the other of the spectrum can facilitate or block an individual's tendencies (Ryan & Deci, 2002).

The focus of the theory is on individual growth tendencies and inherent psychological needs which influence self-motivation and personality integration (Ryan & Deci, 2000a). According to this theory, people have innate predispositions to integrate human nature and social contexts that can either positively or negatively influence the individual's behaviors. To promote healthy intellectual or emotional functioning in humans, three specific needs should be met: competence, relatedness, and autonomy (Ryan & Deci 2002).

SDT has evolved through over thirty years of exploration and research. Today's theory is comprised of four mini theories: Cognitive Evaluation Theory, Organismic Integration Theory, Causality Orientations Theory, and Basic Needs Theory (Ryan & Deci, 2002). Cognitive Evaluation Theory describes how social contexts influence intrinsic motivation. Organismic Integration Theory explains extrinsically motivated behaviors. Causality Orientation Theory details differences in orientations towards the social world. Basic Needs Theory illustrates the relationship between motivation and goals towards health and wellbeing.

Black and Deci (2000) offer the opinion that SDT sees motivated behaviors as spanning the spectrum of internal locus of control or external locus of control. Those in the internal locus of control are considered to be intrinsically motivated. Those in the external locus of control are seen as extrinsically motivated. Intrinsic and extrinsic

motivation are additional key components of SDT. Vansteenkiste, Lens, and Deci (2006) differentiate intrinsic motivation or "engagement in an activity for its own sake" (p. 20) from extrinsic motivation or "engaging in an activity to obtain an outcome that is separable from the activity itself" (p.20). Black and Deci (2000) believe that intrinsically motivated behaviors are carried out due to interest and are autonomous. Furthermore, "autonomy-supportive contexts tend to maintain or enhance intrinsic motivation and promote identification with external regulations, while controlling contexts tend to undermine intrinsic motivation" (Black & Deci, 2000, p. 742). Ryan and Deci (2006) note that SDT "views the issue of autonomy as a key to understanding the quality of behavioral regulation" (p. 1562). They also see autonomy as a quality of self-regulation.

On the other side of the spectrum is extrinsic motivation. Ryan and Deci (2000b) see extrinsic motivation as non-autonomous and contrasting with intrinsic motivation. According to the authors, extrinsic motivation and extrinsically motivated behaviors occur due to outside consequences and control. Vansteenkiste et al. (2004) offer the opinion that within SDT, "learning is an active process that functions optimally when students' motivation is autonomous (vs. controlled) for engaging in learning activities and assimilating new information" (p. 247).

Ryan and Deci (2006) explain that they "attempt to apply self-determination theory and the empirical evidence it yields in fostering healthy self-regulation and positive mental health" (p. 158). Furthermore, Vansteenkiste, Lens, and Deci (2006) believe that SDT explains differences in learning strategies, performance and persistence in students.

Significance of the Study

The results from this research will advance the understanding of the relationship between motivation and self-regulation when incorporating *Getting Things Done*™ software with pre-service teachers in their Educational Technology course. This research will also set the stage for future research with these constructs for this or other populations. Finally, the research will add to scholarly information on the topic of motivation and self-regulation in pre-service teachers.

Assumptions of the Study

1. Subjects participating in the study are a representative sample of pre-service teachers attending the university under study.
2. Subjects will respond honestly to the questions on the MSLQ and the open-ended questions in the pre- and post-testing processes.
3. Subjects participating in the interviews will respond honestly and truthfully to the questions posed to them during the process.
4. Subjects in the experimental groups will utilize the *Getting Things Done*™ software during the course of the semester.

Limitations of the Study

1. The sample is limited to pre-service teachers enrolled in introductory Educational Technology courses taught by multiple instructors.
2. The sample size may limit the generalizability of the results of the study.
3. The population of pre-service teachers may limit the generalizability of the results of the study.

4. The duration of the study is relatively short in nature (16 weeks) and may have an effect on the generalizability of the study.
5. The qualitative data in this study could have interpretations other than those found by the researcher.

Definition of Terms

Pre-service teacher: Students enrolled in teacher education programs at degree granting institutions of higher education.

Educational Technology: "The study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (Richey, 2008, p. 24).

Educational Technology 3123 (EDTC 3123): An undergraduate level course for pre-service teachers in the field of education at a Midwestern university. The course covers planning and developing instruction using educational media and technology. The course also covers materials development, contemporary applications of computers and other electronic systems for instruction as well as integration of instructional design, instructional media, and instructional computing. (OSU Course Catalogue, 2012-2013).

Self-regulation: "Self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2000, p. 14).

Self-regulated learning: "Self-directive processes and self-beliefs that enable learners to transform their mental abilities…into an academic performance skill" (Zimmerman, 2008, p. 166).

Motivation: Sense of energy or activation regarding an end result (Ryan & Deci, 2000b).

Intrinsic Motivation: Accomplishing something due to innate interest (Ryan & Deci, 2000b).

Extrinsic Motivation: Accomplishing something due to an external influence (Ryan & Deci, 2000b).

Web 2.0:

> "A trend in the use of World Wide Web technology and web design that aims to facilitate creativity, information sharing, and, most notably, collaboration among users. These concepts have led to the development and evolution of web-based communities and hosted services, such as social-networking sites, wikis, and blogs." (http://en.wikipedia.org/wiki/Web_2, 2008).

Getting Things Done™: David Allen's (2001) productivity and organizational method. The method is based on two objectives. First, capture everything that needs to be accomplished in a logical and trusted organization system outside of one's thoughts. Two, use discipline to make front-end decisions about items in one's life and making plans for items that will be occurring in the future.

Getting Things Done™ software: Organizational and productivity software designed to assist individuals in completing tasks and events within predefined time frames as well as planning for long range goals.

Conclusion

Pre-service teachers have only a short period of time to learn as many competencies and skills as possible for their transition to in-service teaching. Assisting these pre-service teachers with the development of additional tools for the classroom is one goal of the Educational Technology course. *Getting Things Done™* software has the

potential to provide pre-service teachers with a positive influence on their personal growth in relation to their accomplishments in this course. This dissertation attempts to integrate an examination of motivation and self-regulation for pre-service teachers with the use of *Getting Things Done*™ software.

Chapter 1 outlines the purpose, statement of the problem, research question, theoretical approach, assumptions and limitations of the study, and definition of terms. In the chapters that follow, the research will be organized in the following manner. Chapter 2 contains a review of literature relevant to the research topic including a) Pre-service Teachers, b) Self-Regulation, c) Motivation, d) Self-Regulation and Motivation, e) Pre-service Teachers, Self-Regulation and Motivation, f) Web 2.0, and g) *Getting Things Done*™. Chapter 3 discusses the research methodology, including general procedures, subject information, a review of the quantitative and qualitative materials utilized in the study, study procedures, and data analysis. Chapter 4 summarizes and discusses the results from the study, including quantitative and qualitative data. Chapter 5 concludes the research by connecting the results to existing literature, addressing limitations and implications, and offering suggestions for future research.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The purpose of this study was to investigate the effect *of Getting Things Done*™ (GTD) software on the motivation and self-regulation of pre-service teachers in an introductory Educational Technology course. The following research question was addressed: Did pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation? This chapter will review literature related to the research by looking at the following areas: a) Pre-service Teachers, b) Self-Regulation, c) Motivation, d) Self-Regulation and Motivation, e) Pre-service Teachers, Self-Regulation and Motivation, f) Web 2.0, and g) *Getting Things Done*™.

Pre-service Teachers

Pre-service teachers are students enrolled in teacher education programs at degree granting institutions of higher education. These students traditionally seek college degrees in one of three areas. The first is Early Childhood Education, or education of children younger than 5. The second is Elementary Education, or education of children in grades 1-8. The third is Secondary Education, or education of children in grades 6-12. According to Ottensen (2007), "teacher education is usually made up of three parts:

academic coursework providing subject-matter knowledge, professional coursework focusing on pedagogical issues, and field experience during internship periods" (p. 613).

One form of professional coursework essential in preparing today's pre-service teachers for their classrooms is instruction on effectively implementing technology into the educational process. While Strudler and Wetzel (1999) note that pre-service teachers will be less inclined to use technology when they teach if their education faculty do not use it in the college classroom, there is encouraging news regarding the technological preparation of pre-service teachers. The National Center for Education Statistics (NCES) (2007) published findings related to Educational Technology in teacher education programs. The report found that 57% of all Title IV degree-granting instructions offer teacher education programs. Of those offering teacher education programs, 100% report some sort of technology integration into the teacher education process. That percentage can be translated to integrating technology into methods courses, field experiences, and stand alone Educational Technology courses. Teacher education planners find that learning about technology is a fundamental component to the pre-service teacher experience (Schrum, 1999).

Morrison and Lowther (2005) describe ways pre-service teachers can learn to utilize computer technology in their lesson planning. Ideas include rewriting story endings with word processing programs, calculating food costs with spreadsheets, and creating student newspapers with publishing programs. Bitter and Pierson (2005) note the increased use of other technology tools. They believe that email opens the lines of communication among teachers with internet searches used for research and knowledge acquisition. Benson et al. (2004) deem that pre-service teachers should be able to instruct

their students in basic technology functions such as using the internet, multimedia products, and CD-ROMS. For pre-service teachers to employ these technologies in their classroom, they themselves must be proficient in the use and application of a variety of technological functions and tools.

Pre-service teachers learn additional technological integration skills from personal projects and experiences in their technology coursework. Most pre-service teachers create a portfolio of course work and assignments during the course of their teacher training. The portfolios are used for admission and to showcase accomplishments for the college and future employers. While pre-service teacher portfolios have existed for many years, only in the recent past have colleges of education embraced the notion of placing these artifacts into electronic documents. Barrett (2007) offers this general definition for portfolios, "An educational portfolio contains work that a learner has collected, reflected upon, selected, and presented to show growth and change over time, work that represents an individual's or an organization's human capital" (p.436). Barrett goes on to note that "an electronic portfolio uses technologies as the container, allowing students or teachers to collect and organize portfolio artifacts in many media types (audio, video, graphics, and text). Hypertext links organize the material, connecting evidence to appropriate outcomes, goals, or standards" (p. 438). Overall, the e-portfolio is a versatile tool for pre-service teacher education.

Online courses are another experience for pre-service teachers. According to Dempsey and Van Eck (2002), "Online learning is any learning that uses the internet to deliver some form of instruction to a learner or learners separated by time, distance or both" (p. 283). The authors also note that online learning may be asynchronous,

synchronous, or a combination of the two forms of communication. Allen and Seaman (2007) found that 86% of students in online courses are undergraduates and the majority of universities offering online courses expect the number of students enrolled in those courses to continue to increase. With this in mind, online learning has the potential to play a significant role in teacher education preparation. Sorin (2004) conducted what she called the Webfolio project which was designed to address issues of integration, relevance and collaboration for pre-service teachers. According to the author, "it was an online learning environment, where education students, and education related professionals… interacted with each other and accessed virtual resources to explore topics of significance to the developing and practicing educational professional" (p. 103). After the course, 86% of participants reported that the experience was beneficial to them. Pre-service teachers should be taught not only ways to integrate technology into their classroom, but also taught in ways that will expose them to prevailing forms of technology integration.

Delfino and Persico (2007) believe that "future teachers should be trained with methods and tools that are similar to those they are supposed to use with their own students" (p. 351). Furthermore, the experiences of pre-service teacher education will shape pre-service teachers' actions once they arrive in their own classrooms (Kennedy, 1999). Importantly, Benson et al. (2004) found that students showed a statistically significant increase in their technological knowledge and skills after completing a technology education course and a technology integration student teaching experience. Strudler and Wetzel (1999) found that pre-service teachers view Educational Technology as a vital component of their professional training. In today's world, it is becoming more

difficult to imagine sending pre-service teachers to their own classroom without technological skills and abilities.

Self-Regulation

Self-regulation can be defined as "self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2000, p. 14). Pintrich describes self-regulated learning as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment (2000, p.453)." Hofer, Yu, and Pintrich (1998) believe that self-regulated learning is a central part of academic performance and achievement in students. Boekaerts and Cascallar (2006) contend that students who are able to self-regulate feel control over their own learning. Zimmerman (2002) also says self-regulation is essential in the education process since a primary goal of education is to develop lifelong learning skills that will allow students to function in their chosen workplace.

Looking at self-regulation from an education standpoint, Zimmerman, Bonner, and Kovach advocate the notion that students use self-regulation to "attain specific educational goals, such as analyzing a reading assignment, preparing to take a test, or writing a paper" (2008, p.2). They also found that high achieving students set specific learning goals, self-monitor, and then adapt their efforts. McCann and Turner (2004) suggest that successful student self-regulation comes from the ability to cope with different emotional states during the learning process. Zimmerman (1998a) characterizes self-regulated learners as those who view their academics as a proactive learning

experience that they initiate for themselves rather than as a learning experience provided or completed for them. Schunk and Zimmerman (1998) state that strategy teaching or teaching students systematic methods for working on academics is an important component in self-regulated learning. Strategy teaching increases motivation and independent work on academic materials. Winne (1995) offers the opinion that self-regulated learning develops in increments as students engage in educational experiences. Those experiences provide students with the ability to build awareness about future self-regulation.

Wolters, Pintrich, and Karabenick (2003) present four common assumptions seen in the majority of self-regulated learning models. These assumptions include the belief that 1) students are active participants in their learning, 2) students can monitor and control certain portions of their learning environment, 3) students can compare their personal progress against standards, and 4) self-regulated students mediate between individual characteristics and actual performance. The researchers go on to describe four phases of self-regulated learning that can be utilized in the classroom. Phase 1 includes planning, setting goals, and initiating awareness of the task in comparison to personal knowledge. Phase 2 relates to metacognitive awareness monitoring related to the task or the self. Phase 3 comprises of personal effort to control and regulate the task or the self. Phase 4 concerns reflections and responses to the task or the self. These assumptions and phases form the basis of the Motivated Strategies for Learning Questionnaire (MSLQ) utilized in the research for this dissertation.

Zimmerman (2002) states that while research reveals that self-regulation leads to success in academics, many students do not know how to self-regulate their academic

studying. How do you help students develop self-regulation? Zimmerman (1986) notes there are no specific learning environments which ensure students will develop the ability to self-regulate. According to Zimmerman, this means that teachers should use an assortment of methods for assisting students in the achievement of their goals. He suggests the following self-regulation strategies be incorporated into the learning environment: helping students 1) become active participants in their personal learning, 2) teaching students self-evaluation processes, 3) helping students see themselves as competent learners, and 4) constructing an optimal learning environment. Zimmerman (2002) also believes that teachers should assist their students in recognizing their own strengths and limitations in learning. McCann and Turner (2004) propose that teachers provide feedback on errors in the learning experiences rather than focusing on insufficiencies. Zimmerman, Bonner, and Kovach (2008) feel that specific instruction in goal setting, self-monitoring, and methodical practice can help students develop self-regulation. Wolters, Pintrich, and Karabenick (2003) offer three cognitive strategies to help develop self-regulation: 1) rehearsal, 2) elaboration, and 3) organization. Rehearsal strategies include memorization of materials through reciting phrases over and over. Elaboration strategies include summarizing the materials or putting the materials into one's own words. Organization strategies include writing notes, drawing diagrams or creating concept maps.

McCann and Turner (2004) contend that students must deal with situations both in and out of the classroom and learning volitional control can assist students in mastering academic challenges. Boekaerts and Cascallar (2006) state that student interactions with teachers and peers affect self-regulation, which leads the authors to explain that

contextual classroom clues can either prompt or impede the use of self-regulation. The researchers go on to describe classrooms which use situated learning or anchored instruction to assist students in knowledge building and collaboration to help support the development of self-regulation. A study by Zimmerman and Martinez-Pons (1990) compared 14 different self-regulated learning strategies in middle and high school students. The results indicate that girls used self-regulation strategies more often than boys, gifted students possessed more self-regulation than traditional students, and self-regulation increased from 5th to 8th grade but decreased by 11th grade. The authors offer the following suggestions for teachers: find ways to reduce social comparisons, focus on task mastery, and assist students in the use of learning strategies. Wolters (2003b) also looked at self-regulation, interestingly, as a way to understand procrastination in college students. The author notes that those students who procrastinate are starkly contrasted with those who self-regulate. The study found that procrastination was related to student's beliefs about their ability to complete required coursework. These results point toward the belief that those with high self-regulation do not procrastinate as much as those with low levels of self-regulation. Overall self-regulation in education is a complicated topic, but students and teachers can work together to improve learning both in and out of the classroom.

Online learning is rapidly becoming a mainstay of education at all levels. College students have the ability to take courses in the traditional classroom setting, via online platforms or through a blended approach. Various authors have looked at the impact of online learning on self-regulation in higher education. Schunk and Ertmer (1999) assessed the influence of process and product goals on the achievement of college

students undergoing computer skills training. The first experiment found significant correlation results on the two self-regulation measures. The authors note that providing students with process goals was successful in improving achievement outcomes. Azevedo and Cromley (2004) researched the effect of self-regulation training on college students' ability to regulate learning about the circulatory system in a hypermedia environment. Results indicate that training in self-regulation is effective in improving students' comprehension of a complex topic. Chen (2002) found that effort regulation, a component of self-regulated learning, was the most effective in lecture environment achievement in an information systems course. Lynch and Dembo (2004) utilized the MSLQ to look at learner self-regulation in hybrid learning environments. Interestingly, the only items significantly correlated to final grade and self-regulation were self-efficacy and verbal ability. Time and study environments, help seeking, internet self-efficacy, and intrinsic goal orientation were not significantly correlated. The authors attribute this to the blended environment of the class and the fact that the college was a top-tier university with a highly competitive admission process. These two factors mean that students may be highly self-regulated to gain admission and that the face-to-face time with the instructor may lessen the need for self-regulation in the online component of the course. Overall the results of these studies indicate that self-regulation plays a notable role in online learning in many different capacities.

Educators at the elementary and secondary level who want to develop self-regulation ability in their own students need to shift the responsibility of learning from themselves to their students (Zimmerman, Bonner, & Kovach, 2008). That means that we must educate pre-service teachers about methods to increase not only their own self-

regulation but also that of their future students. The question could be raised of why do we need to develop self-regulation in pre-service teachers? Dettori, Giannetti, and Persico (2006) offer the thought that teachers need self-regulation skills to be able to adapt to different classroom situations, to keep up with technological and cultural changes, and to maintain effective classroom management. Paris and Winograd (2003) suggest that self-regulated teachers should comprehend their personal thinking so that they can cultivate the thinking of their students. Randi and Corno (2000) focus on the fact that self-regulation is needed for preparation and success in school due to the demands, restraints, and affordances that schools offers students. Sungur and Tekkaya (2006) note that there is little value in self-regulatory skills if students are not motivated to use them. The authors utilized the MSLQ to investigate how problem-based learning and traditional instruction affect self-regulated learning in high school students. The results of the study indicated that self-regulation is enhanced through problem-based learning.

How do we go about training pre-service teachers to be more self-regulated? Kitsantas and Baylor (2001) conducted self-regulation training with pre-service teachers in an introductory Educational Technology course via their Instructional Planning Self-Reflective Tool (IPSRT). The results found that students improved their performance and attitudes toward instructional planning based on training they received on self-monitoring and self-evaluation. Hofer, Yu, and Pintrich (1998) advocate the use of a two-by-two matrix to teach students self-regulation. These factors include a focus on the constructs of knowledge and beliefs as well as information on regulation strategies and the cognitive and motivational domains. The authors implemented this model in a

Learning to Learn course whereby students were taught how to process information, take notes, prepare for tests, set goals, and manage their time.

Randi and Corno (2000) put forth several different instructional methods for increasing self-regulation in students. These include encouraging flexible assignments, implementing collaborative learning, scaffolding instruction, utilizing self- and peer-evaluations, and embedding assessment into the curriculum itself. These are only a few of a variety of methods and techniques utilized. The main concern is to train pre-service teachers to become aware of self-regulatory teaching methods that can be utilized in their future classrooms.

Paris and Winograd (2003) note that students who see teachers model self-regulatory behavior such as planning, making priority decisions, and dealing constructively with bad situations will model that behavior. Zimmerman (2002) contends that the goal of teachers should be to empower their students to become self-aware of their need to self-regulate as opposed to accommodating every student's limitations. However, McCann and Turner (2004) point out that regardless of the effort teachers expend on developing self-regulatory learners, state guidelines and curriculum standards must still be followed and certain topics or subjects are more difficult to teach in self-regulatory ways than are others. A key component to remember is that while teachers chose the assignments and homework, students make the choice to study and do the work (Zimmerman, 1998b). Therefore, students and teachers must work collaboratively to reach requirements in a way that fosters not only self-regulation, but also knowledge and understanding.

Motivation

Motivation is the activation and persistence of behavior and is partially embedded in cognitive actions; it functions through goal setting and self-evaluative reactions (Bandura, 1977). Moreover, Bandura (1977, p. 193) contends that "self-motivation involves standards against which to evaluate performance. By making self-rewarding reactions conditional on attaining a certain level of behavior, individuals create self-inducements to persist in their efforts until their performances match self-prescribed standards." In a later study, Bandura (1989) infers that a large source of personal motivation comes from cognitive activities whereby forethought is utilized to anticipatorily guide one's actions and plan future courses of action. Furthermore, people set goals for themselves and plan courses of action based on their anticipation of likely outcomes. Ryan (1998) believes that the discipline of motivation is a cornerstone to the science of human behavior due to its focus on what moves people. Anderson (2001) believes that those who exhibit the capacity for self-regulated learning have the ability to direct and monitor their metacognitive and cognitive activities as well as maintain the necessary motivation to accomplish their goals. Bandura (1991) offers the thought that the ability to influence oneself through personal challenges and evaluate one's attainments is a key cognitive instrument of motivation.

According to Bandura, (1977) a fundamental component of motivation is efficacy expectation, which he defines as the assurance people have that they can successfully accomplish the behaviors needed to generate an outcome. Efficacy beliefs influence people's feelings, thoughts, motivations, and behaviors (Bandura, 1993). Individual's efficacy beliefs or self-efficacy influences anticipatory scenarios; people with high self-

efficacy visualize successful settings which provide positive guides for performance and people with low self-efficacy visualize failed settings which reduces motivation and damages performance (Bandura, 1989). Schunk and Ertmer (2000) see perceived self-efficacy as a key self-regulatory motive. Pajares (2008) contends that self-efficacy beliefs are foundational to motivation, happiness, and personal achievements.

Pajares (2008) notes that individuals with strong self-efficacy see challenging tasks as trials to be mastered as opposed to threats to be escaped. Therefore, self-efficacy beliefs influence individual accomplishment levels in a very powerful way. Research by Braten, Samuelstuen, and Stromso (2004) details findings that business administration college students who anticipated success reported higher levels of self-regulatory strategy use than those who thought they would fail. As Bandura (1993) postulated, the most central and pervasive personal agency is subjective belief about the ability to maintain control over functioning and life events. Bandura goes on to say that one of the major cognitive mechanisms of motivation is the ability to exercise self-influence over personal challenges. Linnebrink and Pintrich (2002) see self-efficacy as a judgment of task-specific competency based on successes and failures. They offer the opinion that the best way to facilitate self-efficacy in educational settings is to provide students with opportunities to be successful on assignments within their capabilities. Motivation is not fostered, they contend, through incorrectly praising task accomplishments. Incorrect praise has the possibility of fostering mistaken abilities. Pajraes (2002) puts forth the notion that beneficial self-regulatory practices cause greater self-efficacy and achievement in multiple academic subjects. Zimmerman and Kitsantas (1997) discovered that high school females working on a complex skills task showed significant

results when social goal setting and self-monitoring were utilized to enhance their self-efficacy. The researchers also found high correlations between self-efficacy and intrinsic interest. The authors offer the thought that providing students with social guidance during complex skill learning prepares students to utilize self-regulation when working on their own.

Linnebrink and Pintrich (2003) offer a two-sided approach to student motivation. The authors generalize that a student is motivated if they have interest in, are excited about, or think that school tasks are important. Additionally, students are motivated when they have high self-efficacy or believe that they can accomplish school tasks. Finally, the researchers postulate that educators can arrange instruction to positively impact student self-efficacy and learning. Joo, Bong, and Choi (2000) researched the effect of academic self-efficacy on learning and performance in web-based instruction. The results revealed a significant relationship between self-efficacy for self-regulated learning and student confidence in the classroom and on the internet. The authors note that if educators have self-efficacy and confidence information about their students when planning instruction, instructional time could be allocated to improve weaker skills.

Pokay and Blumenfield (1990) researched the relationship between student motivation and learning strategy usage with high school math students. The researchers reported that motivation research points to the prominence of self-concept of competence, belief of successfulness, and perceived subject worth as forecasters of academic behavior at different times in the semester. The results from their study found significant results with regards to motivation and the use of learning strategies early and later in the semester. Wang, Ertmer, and Newby (2004) examined how vicarious learning

experiences and goal setting, individually and combined, influenced the self-efficacy of pre-service teachers within a technology integration setting. While all results were significant, pre-service teachers who received the combination of vicarious learning experiences and goal setting related to technology integration saw the most significant increase in their self-efficacy. The authors point out that these conditions may assist pre-service teachers with the confidence to use technology in their own classrooms.

Intrinsic motivation, according to Zimmerman and Schunk (2008), concerns the interest, enjoyment, and contentment in a duty or activity completed by individuals. Vansteenkiste, Lens, and Deci (2006) offer the opinion that intrinsic motivation is an activity in which the behaviors are rewarding in and of themselves as opposed to physiological drives. Deci, Koestner, and Ryan (2001) completed a meta-analysis of the interplay between extrinsic rewards and intrinsic motivation. The results revealed that educators should focus on facilitating intrinsic motivation in students rather than focus on rewards for motivation. Research by Zuckerman et. al (1978) looked at intrinsic motivation in college students working collaboratively, in pairs, on a task. The authors discovered that those students who were given actual choice over the illusion of choice worked on the task significantly longer. In summary, the authors state that an individual's motivation is higher when they are given more control over their environment than when it's controlled for them. Wolfe's (2001) work on the Dragonfly Web Pages, interlinked educational web pages for elementary students, promotes intrinsic motivation by giving students control through choices in problem solving.

Ames (1992) assessed classroom structure as it relates to achievement goals and student motivation. The author explains that tasks should be meaningfully focused,

contain a variety of designs, and assist students in goal setting. Classroom authority needs to provide students with the ability to participate in the decision-making process, with decisions based on effort as opposed to the evaluation of ability, and giving students the opportunity to develop independence. When it comes to student evaluation, educators need to consider effort recognition, emphasize individual improvement, and promote mistakes as part of the learning process. Overall, viewing motivation as a qualitative change in multiple classroom structures allows students to see themselves in the learning process.

Pintrich (2003) summarized five major ways educators can motivate students through corresponding design ideas. First, utilize self-efficacy and competence beliefs to motivate students. This can be accomplished through competence-based feedback and classroom tasks that challenge students yet allow them to be successful. Second, give students control and choices. Present feedback centered around learning and student control of the learning. Additionally, develop understanding and caring relationships with students. Third, ensure students have high interest and intrinsic motivation towards the topic. Provide materials in a novel and stimulating manner, use personally meaningful and interesting materials, and exhibit teacher curiosity on the subject. Fourth, make sure students are motivated with high value towards the topic. Materials should be relevant and personally identifiable. Fifth, goals should contribute to student motivation and provide a sense of direction. Promote student responsibility, foster classroom discussion on mastery and understanding, and nurture cooperative and collaborative classroom groups to achieve goals.

Self-Regulation and Motivation

Schunk (2008) suggests that self-regulation is inspired by motivation. One important component of this is perceived self-efficacy. Schunk notes that students with higher self-efficacy will put forth more effort, try longer when the task is difficult, and accomplish tasks at higher completion rates. How is higher self-efficacy developed? Schunk contends that learners develop higher self-efficacy from successful personal performances, positive experiences of peers, and persuasive reports from teachers. Pintrich and DeGroot (1990) conducted a correlational study to explore the link between motivation, self-regulated learning, and academic performance in middle school English students. The authors believe that differences in self-regulation could be linked to differences in student motivation. The results suggested that self-efficacy was connected to cognitive engagement and academic performance and intrinsic value was strongly associated with cognitive strategies and self-regulation. According to the authors, these outcomes suggest evidence to support inclusion of motivation and self-regulation learning elements in the classroom. Pajares (2008) contends that students who utilize effective self-regulation demonstrate greater self-efficacy and accomplishment in school settings, therefore self-regulation should be a part of improving self-beliefs and success in school.

Lens and Vansteenkiste (2008) advocate that the degree to which students use self-regulated learning strategies is contingent on their motivational resources. The authors present suggestions to increase self-regulated learning. These include, organizing the learning environment to be free of distractions, reducing the number of activities that are not related to academics, developing specific goals for the future related to the current

academic subject, and creating intrinsic learning goals as opposed to extrinsic learning goals. Zimmerman and Schunk (2008) observed that even though self-regulated learning research yielded positive results in the classroom, the effects were not sustained over the long term in less-structured environments; these findings led to research on sources of student motivation to self-regulate. According to the authors, one important component of the self-regulation and motivation interplay is student interest in a topic. Interested students persist while uninterested will disengage. Corno (2008) believes that motivation should be an after effect of learning to self-regulate. However, Zimmerman (1998a) advocates that there is not a single learning strategy that will work for all students and the usefulness of a given strategy changes as students develop additional skills. Therefore, learning should be conceptualized as an open-ended cyclical process which includes processes such as goal setting, self-efficacy beliefs, self-monitoring, self-evaluation, and adaptations.

Pintrich (2004) details a four phase self-regulated learning conceptual framework related to motivation and leaning in college students. Phase 1 includes planning and goal setting; Phase 2 brings in self-monitoring and metacognitive awareness; Phase 3 comprises control and regulation of self or task; and Phase 4 consists of reactions and reflections. Pintrich points out that students obviously utilize different strategies and have different levels of motivation for different courses. Roberts et. al (2006) researched the competencies of successful pre-service and inservice agricultural science teachers. The results revealed several traits of a successful teacher, including internal motivation, time management, planning and organizational skills, and people skills.

Kinzie (1990) presents potential methods for effective instruction including learner control, self-regulation and ongoing motivation. As noted by the author, learners are more effective when suitable instructional selections, based on useful learning strategies, are coupled with motivation to learn. Artino and Stephens (2007) investigated academic motivation and self-regulation in undergraduate and graduate students in an online environment. Results indicated that graduate students were more effective in academic self-regulation. The authors provide suggestions for conducting online instruction. Including, offering specific instructional support and organization, developing self-efficacy in students, encouraging collaboration between students, and scaffolding online communication.

Wolters (2003a) sets forth the notion that when it comes to educational motivation, those learners with self-regulatory skills tend to possess an assortment of adaptive behaviors which encourage persistence and willingness to participate in academic assignments. Therefore, the author contends, self-regulated learners can choose, monitor, and control the use of those behaviors. Wolters also presents a compilation of strategies to regulate student motivation. These include personal consequences and rewards, self-talk about goals, increasing intrinsic motivation or interest in the situation, removing distractions, managing self-efficacy through goal setting and positive self-talk, and regulation of emotions. Kuyper, van der Werf, and Lubbers (2000) conducted a longitudinal study to research the educational attainment of secondary education students, postulating that a highly motivated student will achieve more in the long run. Achievement motivation and fear of failure predicted achievement while self-regulation was not associated with mean achievement.

Pre-service Teachers, Self-Regulation, and Motivation

Randi (2004) described ways in which teachers can develop self-regulation in their students. Ideas include encouraging students to use self-regulated learning strategies such as goal attainment or task mastery. Randi also presented information on outcomes of self-regulation by pre-service teachers. These results include higher levels of autonomy, reflection on the teaching process, and internalization of knowledge. The author states that if self-regulation helps students to assume responsibility of their learning, then it should be beneficial to teachers as well. Song, Hannafin, and Hill (2007) view the co-dependence of teaching and learning as important to examine to aid teacher understanding of student needs. According to the authors, one area for teachers to attend to is motivational sensitivity. Teachers who identify student motivational needs assist learners with conceptual changes.

Kremer-Hayon and Tillema (1999) found that pre-service teacher education could play a decisive role in developing the competencies of self-regulated learning by providing more opportunities to allow students to take charge of their own learning, being open to questioning, and constructing new knowledge through testing personal ideas. The authors offer the opinion that teacher education programs may need to include specific information on developing self-regulated learning among pre-service teachers within the instructional curriculum. Tillema and Kremer-Hayon (2002) expanded their earlier work and found that self-regulated learning for teacher educators and pre-service teachers comes from using a reflective approach in teaching, based on gathering information and studying student reactions. One important point is that teacher educators influence their students with

regards to self-regulated learning and, as such, need to ensure proper modeling of self-regulation to their students.

Bembenutty (2006) found that pre-service teachers who seek help for homework tasks from their instructors, have higher homework self-efficacy. Yet students who seek help from peers have lower homework self-efficacy. Chen (2002) discovered similar results regarding working with peers in a recent study on self-regulated learning for college students in an information systems course. Chen reported that those students who studied with peers scored lower on course exams while those who had high effort regulation scored significantly higher. Bembenutty (2007) also found that pre-service teachers who highly value the tasks have higher use of metacognitive strategies, learning self-efficacy, and personal self-efficacy. The author also discovered those pre-service teachers who have high levels of control over their personal time and study environments reported higher levels of learning self-efficacy and teacher self-efficacy.

Perry, Philips, and Dowler (2004) investigated the effects of pairing pre-service teachers with mentor teachers on developing self-regulating lessons for elementary students. Results indicate that pre-service teachers were effective in designing lessons that encouraged self-regulation in the students with whom they were working. Perry, Phillips, and Hutchinson (2006) also presented additional longitudinal data on pre-service teachers developing self-regulation in their own students. These results show that pre-service teachers are capable of promoting self-regulation in their own elementary school students. Kitsantas and Talleyrand (2005) note that pre-service teachers who use self-regulation strategies learn to adapt their performance in light of external and internal classroom situations.

Baylor, Kitsantas, and Hu (2003) postulate that pre-service teachers need self-regulation to write lesson plans. One reason behind this is the fact that pre-service teachers traditionally lack experience, skill, and confidence in their ability. Pre-service teachers who utilized the authors' Instructional Planning Self-Reflective Tool (IPSRT) saw an increase in their self-efficacy and intrinsic motivation for writing lesson plans. Pierce and Kalkman (2003) reflect that pre-service teachers bring years of observational experience into their education classes and instructing them to utilize learner-centered techniques can be challenging. The researchers offer suggestions to assist with the self-regulation of learning. These include intentionally building meaning from information, connecting novel information with existing information, and encouraging students to use directed reflection. The authors argue that motivation is a key issue to using self-regulation during these processes. Training pre-service teachers to utilize these tools themselves increases the probability that they will guide their own students through these processes once they enter the classroom.

Web 2.0

Web 2.0 is the idea of seeing the web as a platform where users actively participate and control data, data that can be thought of as collective intelligence. The term was first coined by Dale Dougherty and Tim O'Reilly in 2004 (O'Reilly, 2005). Defining specifically what Web 2.0 is has been an ongoing process since the term was first introduced. According to Oliver (2007), Web 2.0 is "an umbrella term for many individual tools that have been created with web collaboration, sharing and/or new information creation in mind" (p. 55). Wikipedia (2008) defines Web 2.0 as

> "A trend in the use of World Wide Web technology and web design that aims to facilitate creativity, information sharing, and, most notably, collaboration among users. These concepts have led to the development and evolution of web-based communities and hosted services, such as social-networking sites, wikis, and blogs." http://en.wikipedia.org/wiki/Web_2.0.

Madden and Fox (2006) note that Web 2.0 allows users to contribute content, but not control that content. Whatever way one defines Web 2.0, the components of it have become integral to the way the internet is used today.

However, many of those faculty responsible for educating students have not kept up with the proliferation of Web 2.0 technologies. According to Thompson (2007) students will soon arrive at institutions of higher education expecting the integration of Web 2.0 technologies into the education process and be met with archaic technology. Hardman and Carpenter (2007) believe that the way many schools teach today is inconsistent with the world outside the classroom. Those faculty that have introduced these technologies into the classroom often use them more for delivery of content than changing the way teaching and learning occur (Maloney, 2007). Alexander (2006) believes that the ease of entry into Web 2.0 technologies will lower the barriers to implementation. Alexander sees that implementation as a powerful tool for education and educators.

One area in which technology is infiltrating the university is in teacher education programs. Currently, most colleges of education offer some sort of Educational Technology course to pre-service teachers in hopes not only of teaching them how to use current technology for themselves, but also how to implement technology in their own

classrooms once they graduate. However, Sprague (2004) notes that those within the field of Educational Technology keep to themselves more than they should. Sprague goes on to note that Educational Technology faculty need to interact with other teacher educators so they can learn the best ways to integrate technology into traditional classes. This sharing of ideas and techniques helps technology become an integral part of the teacher education program rather than a stand-alone entity.

While the issue and process of transforming education into a Web 2.0 environment will continue to exist for some time, some educators are currently implementing these technologies into their classrooms. Web 2.0 functions include tools like blogs (web-logs), wikis, and advanced Google functions, and they have become the focus of research regarding pre-service teachers and education. While these tools are for the most part cost-free, Oliver (2007) remarks that educators need to address the potential problems that may occur due to their use. These problems, Oliver notes, include privacy issues, ethical concerns, and program/software disappearance. Privacy and ethical issues come from sharing personal information in public spaces. The disappearance of programs and software occur as developers create something new or move their site to a new location without a "forwarding" address. Taking these issues into consideration prior to their use in class affords teachers and students the knowledge necessary to navigate through the maze of Web 2.0 tools. Albion (2007) notes that this is important because "Teacher education faces the dual challenges of applying Web 2.0 tools to enhance teacher preparation and preparing teachers for whom the application of Web 2.0 tools in the classroom will be authentic practice" (p. 2).

Blogs (web-logs) are one tool pre-service teachers can easily utilize. Oliver (2007) found that the majority (79%) of students in a graduate level Educational Technology course found blogs useful. The instructor also had the students use web bookmarking and most thought it would be very useful in engaging students on the internet. Wassell and Crouch (2008) used blogs in a multicultural education course for pre-service teachers. The goal of the research was for the students to investigate not only the textbook, but also web-related information and to share what they learned. The authors discovered that students were able to "present their own ideas and opinions and respond to others outside the temporal and spatial boundaries of the classroom" (p. 223). Kuzu (2007) investigated the use of blogs in an introductory Educational Technology course for pre-service teachers. The goal of the research was to gather the viewpoints of pre-service teachers towards blogging. The majority (80%) of the class responded favorably to the blogging experience. According to the researcher, blogs allowed for additional communication with the instructor and classmates. Issues addressed by the author included the need for instructional planning prior to the use of blogs in the classroom, the need to use relevant and up to date information, and the need to moderate what the students were blogging about.

While most of the research indicated that students found blogging useful, there is another side to the story. Hernández-Ramos (2004) used blogs and online discussion as methods for pre-service teachers to reflect on their personal beliefs about teaching, learning, and technology. This researcher found that students did not write long detailed opinions about class issues in their blogs. Additionally, only five of the fifty-six students reported interest in using blogs as a teaching tool for their own classroom.

Also included in Web 2.0 are wikis. Foley and Chang (2006) define wikis as, "a type of web site (or a feature of a site) in which users are allowed to add and edit the content on the site" (p. 1). Their research on wikis focused on how wikis can be used as a support for pre-service teachers as they learn about teaching. The results were mixed regarding wiki use. While some saw the wikis as a collaborative tool, others expressed concern over the technical aspect of the process. Overall, the students noted that they prefer discussion boards to wikis.

Overall, Web 2.0 promises to alter the way in which education occurs. No longer are students at any level bound by the four walls of the classroom. Additionally, the web promises collaboration and interaction with others around the world as well as access to information faster than ever experienced. As Rollett et al. (2007) note, Web 2.0 will allow education to become a community of ideas. That community will continue to grow and expand, hopefully embracing more and more educators.

Getting Things Done

The term Getting Things Done originated with Percy Creed, who wrote three versions of a book entitled Getting Things Done in the 1930's and 1940's. These books were written after Creed spent extensive time evaluating the notion of business organization in the United States (www.wikipedia.com, 2008). Davidson (2005) notes another book, also entitled Getting Things Done, was published in 1976, prior to the advent of current technological advances for organizing and streamlining lives. Since those books were written, technology has advanced and the pace of life has picked up speed. Today more and more people are struggling to stay current with commitments and responsibilities. According to Davidson (2005), today's goal for the *Getting Things*

Done™ books, software, and motivational seminars is not to accomplish more in a day, but to complete current tasks with greater peace of mind.

Three authors have written books on the subject of Getting Things Done. Allen (2001) desires for people to be relaxed yet efficient. Bossidy and Charan (2002) want people to get to the heart of issues. Davidson (2005) would like for people to be organized, be better time managers, have increased efficiency, and be more effective.

Bossidy and Charan (2002) note that when space exists between goals and outcomes, there is a gap between ambition and reality. According to Bossidy and Charan, to deal with that gap, people must be realistic, set clear goals and priorities, and follow through. Davidson (2005) thinks that people are distracted, overloaded, have too many choices, and have too many interruptions. Davidson believes the answer lies in organization, efficiency, effectiveness, and managing energy. Allen (2001) offers this, "Ineffective personal organization systems create huge subconscious resistance to undertaking even bigger projects and goals that will likely not be managed well, and that will in turn cause even more distraction and stress" (p. 8).

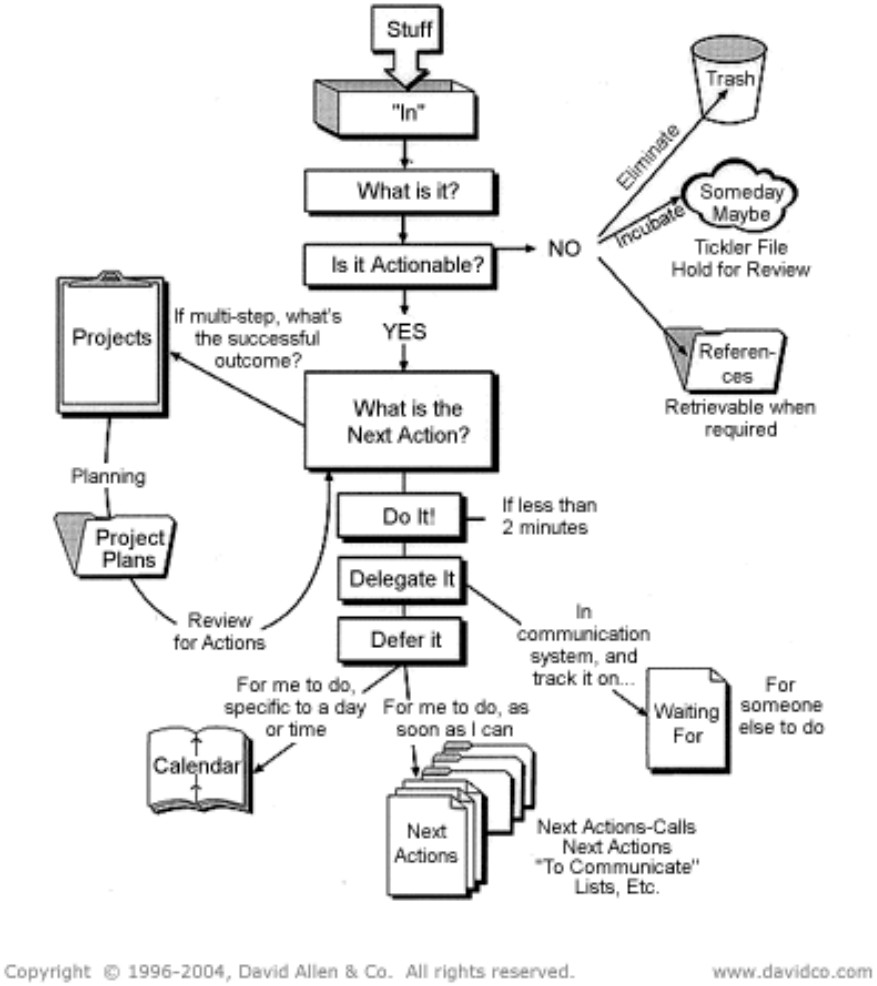
Although there are many books on the topics of organization, productivity, and efficiency, one book has caught the eye of technology experts. This is Allen's (2001) book, *Getting Things Done*™. Google returns almost three-quarters of million hits on the topic. Mann (2004), author of the 43Folders website, notes that Allen's notion succeeds because it addresses the fact that "stuff" is the major barrier in accomplishing daily tasks. Michel (2005) thinks that the system helps to capture tasks, projects and follow-up items dealt on a daily basis. Fallows (2004) likes Allen's notion of closing the open-loops left by unfinished tasks.

According to Robinson (2003) “At some point, you have to actually do something, and getting just about anything done requires the proper tools” (p.4). Allen’s (2001) *Getting Things Done*™ method offers a set of tools for organization. The system is based on what the author calls natural planning. Natural planning involves five phases. The first phase is to determine the purpose of why one is doing what one is doing. The second phase is to understand how your principles give parameters and criteria to your behavior. The third phase is to develop a vision of what a successful outcome to a project would entail. The fourth phase is to brainstorm ways in which projects go from ideas in your mind to finished events. The final phase is to determine the allocation and reallocation of resources to get the project moving.

Allen (2001) describes how to master workflow in five steps: collect, process, organize, review, and do (see Figure 2.1). The first step is to collect, in one place, all “stuff” to which you need to attend. The second step is to process the information contained in the in-baskets. The third step is to organize the information from the process step. The fourth step is to review the outstanding items in your baskets and decide what needs immediate attention and what can be deferred for later. The final step is what Allen (2001) calls the “Do” step. This is where items that take longer than two minutes to complete are acted upon.

Figure 2.1

David Allen's Workflow Diagram



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Allen offers models to consider for the "Do" step. One is the "Four-Criteria Model" whereby individuals determine the context in which the action needs to take place, the time available to complete the task, the energy available to complete the task, and where on the priority list the action items falls. A second model is the "Threefold Model" to evaluate daily items. This means individuals determine to do work as it is predefined, as it shows up, or redefines the work to be accomplished. He recommends the first defining your work process.

There is a lack of scholarly articles on the *Getting Things Done*™ topic and software, yet many websites are dedicated to the topic and Allen's software. Bloggers (i.e. www.gtd.marvelz.com, www.thatcanadiangirl.co.uk, www.smallfuel.com/blog, ideamatt.blogspot.com, blog.ianbicking.org, scottadams.blogs.com, www.foldedspace.org/weblog, and www.officezealot.com) report on their inclusion of Allen's software into their personal and professional lives. Additionally, technology websites post information about the use of the *Getting Things Done*™ method (i.e. lifehacker.com, www.43folders.com, www.minezone.org, lifelearningtoday.com, and www.centernetworks.com). Furthermore, the David Allen Company (www.davidco.com) provides interested users with information, instruction, and support related to the use of the *Getting Things Done*™ method.

No study could be found that sought to determine the relationship between pre-service teachers, Educational Technology, and the *Getting Things Done*™ software. Levin and Wadmany (2008) note that a gap exists in integrating technology into the classroom and teachers' desires to use technology. That gap, Levin and Wadmany note, evolves from the incompatibility between educational goals and the interaction between students, teachers, curriculum goals, and materials. Results from a longitudinal attitude study on the issue found that teacher educators who viewed technology as a partner in teaching demonstrated positive views towards using technology in the classroom. Using technology as a tool for pre-service teachers to accomplish their goals will be more likely to occur when educators believe that the use of technology helps to achieve educational goals. Furthermore, Aoki and Downes (2003) found that college students who feel overwhelmed by information coming in from media and classes struggle to handle all of

the information. Utilizing *Getting Things Done*™ software may provide overwhelmed students with a way to control part of the information bombardment.

Conclusion

Pre-service teachers undergo a lengthy schooling process prior to entering the classroom as educators. Essential to their ability to teach in today's classroom is training in utilizing Educational Technology methods. This training is enhanced when pre-service teachers are taught self-regulatory skills and are encouraged to employ personal motivation. One method of incorporating Educational Technology methods in pre-service teacher preparation is training in Web 2.0 components such as blogs, wikis, and web-based applications. A technique to promote staying on task is instruction in David Allen's *Getting Things Done*™ method.

The following chapter will discuss the research methodology for this study. This will include descriptions of general procedures, subject information, a review of the quantitative and qualitative materials utilized in the study, study procedures, and data analysis.

CHAPTER III

METHODOLOGY

General Procedures

The purpose of this study was to investigate the effect of *Getting Things Done*™ (GTD) software on the motivation and self-regulation of pre-service teachers in an introductory Educational Technology course. This research was conducted at a Midwestern university, within the College of Education, during the Fall 2008 semester. The course utilized in the study was Educational Technology 3123 (EDTC 3123). This is an undergraduate course for pre-service teachers in the field of education at a Midwestern university. The course covers planning and developing instruction using educational media and technology. The course also covers materials development, contemporary applications of computers and other electronic systems for instruction as well as integration of instructional design, instructional media, and instructional computing. (OSU Course Catalogue, 2012-2013). The study was a concurrent mixed methods study, employing both quantitative and qualitative measures to determine and ascertain the differences in motivation and self-regulation between comparison groups with regards to *Getting Things Done*™ software. Creswell and Plano-Clark (2007) note, "The use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone" (p.5). Researching differences between groups via mixed methods provided a more comprehensive explanation regarding the

differences observed. The research question guiding this study was: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation?

There were ten sections of the introductory Educational Technology course (EDTC 3123) taught during the study, seven were taught during the day, two were taught during the evening, and one was taught completely online. Eight face-to-face sections were included in the study. One face-to-face section was randomly chosen to be excluded from the study to provide an equal number of intact sections to divide between the experimental and control groups. The online course was excluded from the study because of the differences in the course format. Three sections of the course were taught by the researcher, while seven sections were taught by other instructors. Differences between instructors were controlled through the use of the standardized curriculum. Sections used the same production assignments, the same text, and the same reading assignments and quizzes. All sections utilized the university online learning platform, Desire2Learn (D2L), to turn in assignments and complete quizzes.

The study took place over the course of a 16-week semester. The first week of the semester was considered a probationary period for students since it is traditionally a time when courses are added and dropped. Therefore, the study did not begin until the second week of the semester. The study concluded after 12 weeks of intervention to minimize the effect on the results caused by the end-of-the-semester projects and course finals. During the 14th week of the semester, the post-test materials were collected from the subjects and debriefing information was presented to the subjects. A pre-test/post-test design was used to collect and analyze the data from the two comparison groups.

Comparison groups consisted of a control group and an experimental group of pre-service teachers enrolled in different sections of a required instructional course. Subjects completed the Motivated Strategies Learning Questionnaire (MSLQ). Furthermore, a Likert-type scale and open-ended short answer/essay questions were collected from all the participants at both the beginning and end of the experimental cycle. Additional qualitative data was collected through interviews with eight randomly selected students participating in the experimental groups. Two students from each of the experimental groups were interviewed. No students from the control groups were interviewed due to the fact that the majority of the interview questions focused on the GTD software utilized during the study as opposed to concepts the software reinforced. During the time of treatment, the control groups, the subjects without GTD software, were presented course content as it is traditionally done. The experimental groups completed course content in the traditional manner, but were also provided with instruction on the *Getting Things Done*™ method, developed by David Allen (2001), as well as instruction for using GTD software to organize course assignments at the beginning of the semester.

Participants

The participants in this study were pre-service education students, either secondary or elementary majors, enrolled in an introductory Educational Technology course (EDTC 3123) at a university in the Midwest. Intact sections were randomly assigned to either the control groups, without GTD software, or the experimental groups, with GTD software. Students enrolled in both the experimental and control groups who were not pre-service teachers were allowed to complete the survey materials; however, their data was not included in the data analysis. Due to the need to compare pre- and

post-test results, only students who completed both the pre- and post-test materials were included in the final quantitative data analysis. Overall there were 90 students involved in the study, with 45 in students in the experimental groups and 45 in the control groups. See Tables 3.1 and 3.2 for details regarding the subjects.

Table 3.1

Section Information

Section	Overall Number Enrolled	*Pre-Service Teachers Completing Pre-Test	*Pre-Service Teachers Completing Post-Test	Experimental or Control
EDTC 3123-001		**Excluded from study		
EDTC 3123-002	19	16	12	Control
EDTC 3123-003	19	14	13	Experimental
EDTC 3123-004	13	12	12	Experimental
EDTC 3123-005	20	15	14	Experimental
EDTC 3123-006	20	16	14	Control
EDTC 3123-007	19	10	7	Control
EDTC 3123-008	17	13	12	Control
EDTC 3123-801	9	8	6	Experimental
EDTC 3123-503		***Excluded from study		
Overall Numbers	136	104	90	

*Students enrolled in the class who were non-education majors were excluded from the study and the subject count
**Section randomly chosen to be excluded from the study
***Online course excluded from the study

Table 3.2

Experimental and Control Groups Subject Information

Sections	Pre-Test Participants	Post-Test Participants	Final Number
Experimental (003, 004, 005, 801)	49	45	45
Control (002, 006, 007, 008)	55	45	45

Instrument/Materials

Quantitative measure.

The Motivated Strategies Learning Questionnaire (MSLQ) was used in this study. According to Pintrich et al. (1993), "The MSLQ is a self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies for a college course" (p. 801). The instrument was first constructed in 1986 to assess the effectiveness of Learning to Learn classes at the University of Michigan (Pintrich et al., 1991). The original format was administered to over 1,700 students over a three-year period with revisions occurring as necessary (Pintrich et al., 1993). Duncan and McKeachie (2005) report the use of the MSLQ in over eighteen countries with populations ranging from elementary age students to graduate students.

The MSLQ has been used to study motivation and self-regulation of K-12 students in areas such as mathematics (Kaya, 2007; Ruiz, 2006; Missildine, 2004), science (Ulkins, 2007; Kennedy, 2007; Barlia, 1999), and music (Bailey, 2006). Studies have also been conducted at the graduate level for medical students (Sullivan, 2003; Barker, 1997) seminary students (Harlow, 2006) and with community college students (Puzzifero, 2006; Reed, 2003). The predominate use of the MSLQ is with undergraduate

students. Studies have been conducted with distance education classes (Richardson, 2007, Dunigan, 2003), economics classes (Zachariah, 1995), accounting classes (Eide, 1998), English composition classes (Wu, 2006; Hatcher, 1999), history classes (Quick, 2000), mathematics (Clarke, 2006; Hurn, 2006; Warneke, 2000), business classes (Thongnoum, 2002), information systems classes (Sanders, 2002; Chen, 2002), and engineering classes (Krupczak et al., 2005; Matthews, 2004). The MSLQ has also been used to study students in online courses (Caldwell, 2006; Fredricksen, 2004; Maupin, 2003), non-traditional students (Spencer, 1999), and under-prepared students (Beverly, 2003). While pre-service teachers have been studied with the MSLQ (Lewis, 2006; Bhattacharyya, 2004; Selvester, 2004; Willems, 2000; McClendon, 1996; Gilles, 1994; McClendon, 1993), no study could be found that sought to determine the relationship between pre-service teachers, Educational Technology, and *Getting Things Done*™ software.

According to Duncan and McKeachie (2005), the instrument consists of 81, 7-point Likert-type items, with responses ranging from 1 (not true at all of me) to 7 (very true of me). The items are divided into fifteen scales, comprising of two major components: motivation and learning strategies. Pintrich et al. (1993) evaluated the reliability and validity of the final version of the MSLQ with 356 students. The reliability for all fifteen scales can be seen in Table 3.3. Predictive validity for the both components, via correlation, can be seen in Table 3.4.

Table 3.3

Coefficient (Cronbach's) Alpha for MSLQ:

Scale	Cronbach's Alpha	Scale	Cronbach's Alpha
Motivational Scales		*Learning Strategies Scales*	
Intrinsic Goal Orientation	.74	Rehearsal	.69
Extrinsic Goal Orientation	.62	Elaboration	.75
Task Value	.90	Organization	.64
Control of Learning Beliefs	.68	Critical Thinking	.80
Self-Efficacy for Learning and Performance	.93	Metacognitive Self-Regulation	.79
Test Anxiety	.80	Time and Study Environment Management	.76
		Effort Regulation	.69
		Peer Learning	.76
		Help-Seeking	.52

Table 3.4

Correlations among MSLQ Scales:

	Intr	Extr	Tskv	Cont	Slfef	Tanx	Reh	Elab	Org	Crit	Mcg	Tstdy	Efft	Prlrn
Extr	0.15													
Tskv	0.68	0.18												
Cont	0.29	0.14	0.30											
Slfef	0.59	0.15	0.51	0.44										
Tanx	-0.15	0.23	-0.14	-0.10	-0.37									
Reh	0.10	0.23	0.12	0.02	0.10	0.11								
Elab	0.48	0.13	0.44	0.22	0.37	-0.13	0.36							
Org	0.27	0.09	0.19	0.02	0.21	-0.05	0.49	0.52						
Crit	0.58	0.06	0.39	0.19	0.42	-0.11	0.15	0.57	0.31					
Mcg	0.50	0.07	0.45	0.17	0.46	-0.24	0.39	0.67	0.55	0.53				
Tstdy	0.32	0.13	0.37	0.00	0.32	-0.17	0.38	0.44	0.44	0.25	0.58			
Efft	0.43	0.11	0.47	0.07	0.44	-0.21	0.26	0.44	0.36	0.25	0.61	0.70		
Prlrn	0.13	0.20	0.09	-0.03	0.05	0.10	0.21	0.19	0.23	0.25	0.15	0.10	0.05	
Hsk	0.10	0.08	0.16	0.00	0.08	0.08	0.18	0.28	0.22	0.19	0.25	0.21	0.18	0.55

Intrinsic Goal Orientation: Intr; Extrinsic Goal Orientation: Extr; Task Value: Tskv; Control of Learning Beliefs: Cont; Self-Efficacy for Learning and Performance: Slfef; Test Anxiety: Tanx; Rehearsal: Reh; Elaboration: Elab; Organization: Org; Critical Thinking: Crit; Metacognitive Self-Regulation: Mcg; Time and Study Environment Management: Tstdy: Effort Regulation: Efft; Peer Learning: Prlrn and Help-Seeking: Hsk

Duncan and McKeachie (2005) state that since the scale was designed in a modular fashion, each scale can be used by itself or with any of the other scale. For this study, the following motivation subscales were used: task value, control of learning beliefs, and self-efficacy for learning. The following learning strategies subscales were used: organization, metacognitive self-regulation, time and study environment management, and effort regulation. These scales were included since they aligned with the research question. See Appendix B for the MSLQ.

The scales that were excluded from the motivation subscales include: intrinsic goal orientation, extrinsic goal orientation, and test anxiety. The scales excluded from the learning strategies subscales included: rehearsal, elaboration, critical thinking, peer learning, and help seeking. These subscales were excluded from the study because they were not in alignment with the goals of this research.

Scale definitions.

Task Value: According to Pintrich et al. (1991) task value refers to the student's assessment of how interesting, how important, and how useful the task is to them. There are six questions in this subscale. Sample questions include the following:

- "I think I was able to use what I learn in this course in other courses.
- I think the course material in this class is useful for me to learn.
- Understanding the subject matter of this course is very important to me. (p. 11)"

Control of Learning Beliefs: This scale investigates the subject's opinion about outcomes being contingent on personal effort instead of external factors like the teacher

(Pintrich et al., 1991). There are four questions in this subscale. Sample questions include the following:

- "It is my own fault if I don't learn the materials in this course.
- If I don't understand the course material, it is because I didn't try hard enough. (p.12)"

Self-Efficacy for Learning and Performance: This scale refers to performance expectations, and self-appraisal of ability to accomplish a task, and confidence in ability to perform the task (Pintrich et al., 1991). There are eight questions in this subscale. Sample questions include the following:

- "I believe I will receive an excellent grade in this class.
- I'm confident that I can do an excellent job on the assignments and tests in this course.
- Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class. (p. 14)"

Organization: Organizing involves selecting appropriate information and establishing connections between information in the class. Organizing takes effort from the student and being organized should increase performance (Pintrich et al., 1991). There are four questions in this subscale. Sample questions include the following:

- "When I study the readings for this course, I outline the material to help me organize my thoughts.
- I make simple charts and diagrams, or tables to help me organize course material. (p. 21)"

Metacognitive Self-Regulation: This scale looks at the knowledge and awareness of students related to self-regulation. In this instrument, self-regulation refers to planning (goal setting), monitoring (attention tracking), and regulating (self-check and correct) (Pintrich et al., 1991). There are twelve questions in this subscale. Sample questions include the following:

- "I try to change the way I study in order to fit the course requirements and instructor's teaching style.
- When I study for this class, I set goals for myself in order to direct my activities in each study period.
- If I get confused taking notes in class, I make sure I sort it out afterwards. (p. 23)"

Time and Study Environment Management: This refers to the ability of students to manage and regulate time and study setting. This includes scheduling tasks in an appropriate manner and organizing where the student studies (Pintrich et al., 1991). There are eight questions in this subscale. Sample questions include the following:

- "I have a regular place set aside for studying.
- I often find I don't spend very much time on this course because of other activities (reversed).
- I make sure I keep up with the weekly readings and assignments for this class. (p. 25)"

Effort Regulation: This part of self-regulation relates to completing course goals in light of difficulties or distractions (Pintrich et al., 1991). There are four questions in this subscale. Sample questions include the following:

- "I work hard to do well in this class even if I don't like what we are doing.
- I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do. (p. 27)" (reversed).

Qualitative measures.

The following qualitative measures were utilized to collect data from participants. First, demographic information was collected from all participants. Participants indicated their gender, current age, number of years of college completed, grade classification, and current major. See Appendix C for the Demographic Data Questionnaire.

Secondly, pre- and post-test Likert-type Scale (not qualitative) questions were used to collect additional data from all participants in the study. The instrument consisted of five, 5-point Likert-type items, with responses ranging from 1 (very high) to 5 (very low). Questions addressed self-assessment of current technological proficiency, current comfort level with technology, self-assessment of ability to successfully complete the course, self-assessment of motivation to complete the course, and self-assessment of organizational skills related to ability to complete coursework. Additionally, one open-ended question was asked of all participants. The question was different for the pre- and post-tests. For the pre-test data collection, participants were asked how they planned on organizing their time and study environment for the course. For the post-test data collection, participants were asked if they learned or experienced anything in the course that helped them organize their time and study environment for the class. Data was summarized and assessed for themes. See Appendices D and E for the pre-test and post-test Self-Assessment Questions.

The final set of qualitative data collected came from eight individual interviews done at the end of the semester with students from the experimental groups. Two student names from each experimental section were randomly chosen from a pool of volunteer names gathered during the post-test process.

Interviews began with general background questions, including gender, age, years of college completed, grade classification and current major. Interview questions focused on students' perception of personal technology proficiency, whether their proficiency changed over the course of the semester, students' perceptions of their level of comfort with technology, how their level of comfort changed over the semester, and their opinion of the ease of successfully completing the course/assignments.

Additional questions were asked about students' motivation toward completing the course, students' organizational skills for the course and how those may have changed over the semester, and organization of time and study environment. Lastly, interviewees were asked what, if anything, they learned in the class that assisted them with personal organization,

Finally, interview questions focused on students' personal opinions related to the use of the *Getting Things Done*™ *(*GTD) software in the courses. The researcher asked a series of open-ended questions about the use of the *GTD* software during the experimental period. These questions focused on the training, the utilization of the software during the semester, use of to-do lists, use of the calendaring functions, ease of completion of tasks based on the use of the software, issues that kept the interviewee from utilizing the software and software-program specific opinion questions. The last series of questions sought student opinions on their ability to utilize the software in other

courses, their recommendation of the software to others, and any additional comments related to the study. The data was summarized and assessed for themes. The GTD interview questions were based on components of the GTD software and the MSLQ subscales utilized in this study. Interviews were conducted at the College of Education and scheduled for a time that was convenient for the interviewee; interviews lasted no longer than 45 minutes apiece. The students' responses were recorded via digital audio recorder and theme analysis was conducted from the results. See Appendix F for the Interview Guide.

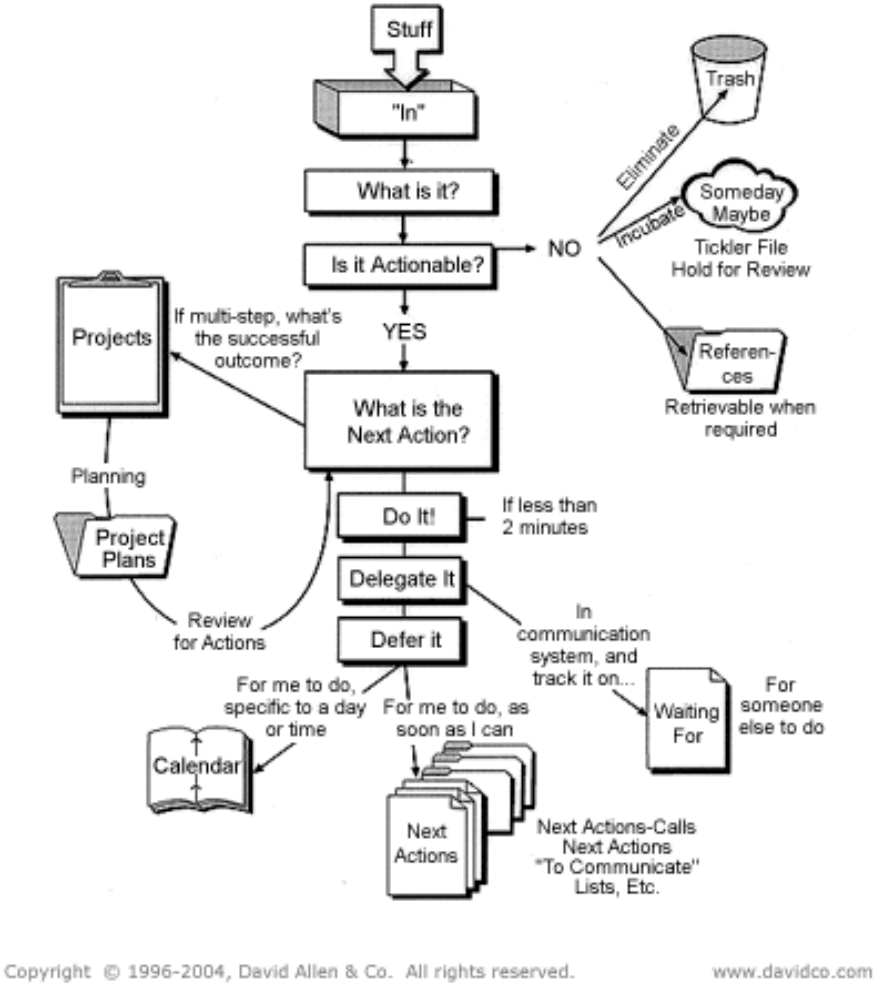
Instructional materials.

At the beginning of the semester, the experimental groups received instructions from the researcher about the use of David Allen's *Getting Things Done*™ software and method to assist them in completing the assignments for the course. The control groups received the same materials following the post-test data collection. Students learned about mastering workflow, natural planning, and the use of two types of *Getting Things Done*™ software to assist with productivity in this course. See Appendix G for the *Getting Things Done*™ PowerPoint Training Materials.

Allen (2001) describes how to master workflow in five steps: collect, process, organize, review, and do (see Figure 3.1).

Figure 3.1

David Allen's Workflow Diagram



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The first step is to collect, in one place, all the "stuff" to which one needs to attend. This involves gathering physical items and representations of electronic items into an "in-basket" that holds said items until time is available to process the information. Allen (2001) notes that this stage is essential for clearing the RAM of the mind so that one is not overwhelmed by trying to keep track of all there is to do. One important note for this stage is to set up enough in-baskets to organize various components of your life, but not so many in-baskets that they become too overwhelming to manage.

The second step is to process the information contained in the in-baskets. This step is time consuming and should only be undertaken with a large block of available time. Processing involves determining what the item is and if an action needs to be taken to deal with it. Actions include determining if this task is a project, if the task is an action item, or if the task is a non-action item.

The third step is to organize the information addressed by the process step. Non-action items will be trashed, filed away for future use, or put into a reference folder. Action items that take two minutes or less to complete are accomplished immediately and those taking longer than two minutes are either delegated or deferred for later. If a task is project based, it goes onto a projects list for action.

The fourth step is to review the outstanding items in the various baskets and decide what needs immediate attention and what can be deferred for later. One way to organize items for review is to document them in a personal organization system. Allen (2001) recommends a calendar that lists projects, *next action* items, and *waiting for* items. The review should take place on a weekly basis for maximum success.

The final step is what Allen (2001) calls the "Do" step. For items taking longer than two minutes to complete another set of organizing procedures are followed. He offers three models to consider during this phase. The first step is addressing the "Four-Criteria Model" where individuals determine the context in which the action needs to take place, the time available to complete the task, the energy available to complete the task, and where on the priority list the action items falls. The second model is the "Threefold Model" used to evaluate daily items. Using the "Threefold Model," individuals complete the work as it is predefined, as it shows up, or defines the work to

be accomplished. Allen recommends beginning with the "defining your work" process. Finally, Allen offers the "Six-Level Model" to assist individuals in reviewing their personal work. This model involves the individual viewing his/her personal priorities from different perspectives. These six perspectives are based on altitude and consist of the "Runway" which lists current items that need to be accomplished. The next level is "10,000 feet" which includes current projects. The third level is "20,000 feet" and is made up of the top ten to fifteen "results driven" categories in your life. Examples here might include health, finances, and strategic planning. The fourth level is "30,000 feet" and involves setting one- and two-year goals for both work and personal life. The fifth level is "40,000 feet" and entails establishing three- to five-year visions for your future. The final level is the "50,000+ feet" level. This is what Allen (2001) calls the *big picture of life* level and where primary life purposes are developed.

The *Getting Things Done*™ method is based on what Allen (2001) calls "natural planning" (p.56). Natural planning involves five phases. The first phase is to determine the purpose of why one is doing what one is doing. The second phase is to understand how your principles establish parameters and criteria for your behavior. The third phase is to develop a vision for the successful completion outcome of a project. The fourth phase is to brainstorm ways to move projects from ideas in your mind to finished events. The final phase is to determine the allocation and reallocation of resources to get the project moving towards completion.

Students also received instruction on the two *Getting Things Done*™ software programs chosen for the study. These programs were used as organizational tools for the course assignments. Instruction was given on setting up and managing an account,

entering action item information into the tasks section of the program and setting up reminders for both iGoogle™ (http://www.google.com/ig) and Remember the Milk (http://www.rememberthemilk.com/).

Procedures

During the second week of the semester, the researcher attended seven sections of the EDTC 3123 face-to-face classes to invite students to participate in the study and complete the pre-test materials, consisting of the MSLQ, open-ended questions and demographic materials. See Appendix H for the Recruitment Script and Appendix I for the Informed Consent Document. One of the researcher's dissertation co-chairs presented the materials to the eighth section, one of the evening classes, because the researcher was engaged teaching the other evening class 80 miles away on a different campus. Sections in both the control groups and the experimental groups were told that the survey would collect data on Attitudes of Pre-Service Teachers towards an Introductory Educational Technology Course. All sections were debriefed on the deception following the post-test data collection. The deception was carried out during the study in to lessen the possibility that the title of the research study might influence or bias the results.

Additionally, those sections chosen to be in the experimental groups received instruction in organizing their course assignments via David Allen's *Getting Things Done*™ method. Students were given two choices for the organization software to be utilized during the semester. The two tools for the organization were either iGoogle™ (http://www.google.com/ig) with the calendaring and task functions added to personal homepages or Remember the Milk software (http://www.rememberthemilk.com/).

Instructions for setting up an account, entering assignments, and managing the accounts were also provided.

At the end of the semester, the researcher returned to seven sections of EDTC 3123 and re-administered the MSLQ and the open-ended questions. The dissertation co-chair returned to the eighth section, the evening class, to re-administer the MSLQ and the open-ended questions, again due to the researcher's teaching schedule. After administering the post-test data collection, the researcher/dissertation chair provided each subject with a debriefing letter and explained the deception in the title to all participants. See Appendix J for the Post-Test Debriefing Letter.

Additionally, those subjects in the control groups were presented with instruction in David Allen's *Getting Things Done*™ method and the two organization tools, iGoogle™ and Remember the Milk following the collection of post-test data. After the post-test data collection, individual interviews with eight student volunteers from the experimental groups were conducted over the course of two weeks. Each interview lasted approximately 45 minutes.

Data Analysis

Quantitative data analysis procedures.

The majority of the quantitative data for this study came from the MSLQ instruments completed by the students at the beginning and end of the semester. Data from each subject was entered into a spreadsheet program and mean scores from each of the seven subscales used in the study were calculated. The subscale means for each subject was entered into statistical analysis software (SPSS). Paired sample t-tests were calculated for each subscale variable at the 95% confidence interval. Additionally, paired

sample correlations, means, standard deviations, and Pearson bivariate correlations between the variables were calculated. To test for statistical differences between the post-test means of the control and the experimental groups, independent samples t-tests were also calculated. For consistency in this study, the researcher and the researcher's co-chair chose the following levels for interpreting r^2 in the Pearson bivariate correlations: low 10%, moderate 15% - 40%, and high 50% and higher.

Additional quantitative data came from 5 Likert-type Scale questions asked of all subjects during the pre- and post-test data collection process. Responses from each question were summarized via subject in a spreadsheet program. Then, summarized pre- and post-test answers for each person was entered into statistical analysis software (SPSS). Paired sample t-tests were calculated for each question. Additionally, means, standard deviations, and Pearson bivariate correlations between the variables were calculated. To test for statistical differences between the post-test means of the control and the experimental groups, independent samples t-tests were also calculated. As stated previously, for consistency in this study, the researcher and the researcher's co-chair chose the following levels for interpreting r^2 in the Pearson bivariate correlations: low 10%, moderate 15% - 40%, and high 50% and higher.

Finally, demographic data was summarized to provide a complete picture of the subjects involved in the study. Gender, grade classification and student major data was tallied. The data for current age and number of years of college completed was tallied and averaged, with range also calculated.

Qualitative data analysis procedures.

One component of the research involved qualitative data collection from open-ended interviews with eight students randomly selected from the experimental groups. The information was transcribed, coded and analyzed for themes utilizing qualitative coding methods. Miles and Huberman (1984) present information on coding data. They note that coding allows the researcher to cluster similar information as a precursor to analyzing the data. Three strategies suggested by Miles and Huberman were utilized in the coding process for this data: counting the number of times a topic is mentioned, clustering the information, and looking for patterns in the information.

A second component of the qualitative data came from open-ended questions asked of subjects in both the experimental and control groups during the pre- and post-data collection. During the pre-test data collection, subjects were asked how they planned to organize their time and study environment for the course. During the post-test data collection, subjects were asked if there was anything learned or experienced in the course that helped them to organize their time and study environment for the class. The information was transcribed, coded and analyzed for themes utilizing qualitative coding methods.

Independent and Dependent Variables

For this study, the *Getting Things Done*™ software served as the independent variable. Motivation and self-regulation served as the dependent variables.

Validity Considerations

Threats to internal and external validity were controlled as much as possible in this study. Creswell (2003) notes that internal validity threats come from "experimental

procedures, treatments, or experiences of the participants that threaten the researcher's ability to draw correct inferences from the data in an experiment" (p. 171). To control for instrumentation, the researcher chose an instrument that has been tested and found to be a reliable and valid measure. This instrument was used for all subjects in the pre- and post-testing and was given at the same point in time during the semester to all subjects. For experimental procedures, the same protocol was followed each time the instrument was given to subjects. For treatment and experiences, all subjects in the control groups and in the experimental groups received the same training on the *Getting Things Done*™ methods and *Getting Things Done*™ software. Gall, Borg, and Gall (1996) offer another threat to internal validity known as "compensatory rivalry by the control group" (p. 472). This threat is also called the John Henry effect. This effect occurs when the control groups try to outperform the experimental groups. To counter this effect, no special treatment or grading incentives were offered to either group.

Creswell (2003) also offers this with regards to external validity threats, "external validity threats arise when experimenters draw incorrect inferences from the sample data to other persons, other setting, and past or future settings" (p. 171). To control for these external validity threats, the results of the study will only be generalized to the population under consideration, pre-service teachers taking a technology methods course.

Gall, Borg, and Gall (1996) present additional threats to external validity; these ecological concerns are the Hawthorne effect and post-test sensitization. According to Gall, Borg and Gall, "The Hawthorne effect refers to any situation in which the experimental conditions are such that the mere fact that individuals are aware of participating in an experiment, are aware of the hypothesis, or receiving special attention

improves their performance" (p. 475). Pre-service teachers tend to complete educational courses together and compare notes on the coursework being completed in different sections of the same course. Gall, Borg, and Gall note that while attempts to control for this effect tend to fail; researchers should attempt to minimize special treatment to experimental subjects. For this study, the researcher attempted to minimize Hawthorne effects by only providing the basic information necessary to the experimental groups to complete the study and not emphasize that the experimental groups are receiving special treatment. Post-test sensitization occurs when subjects remember the pre-test and learn from their responses to the pre-test. For this study, the time between tests downplayed the effects of post-test sensitization.

Conclusion

The following chapter will present the quantitative and qualitative results from the statistical analyses. This will include analysis of the pre- and post-test results from the MSLQ, the Likert-type scale questionnaire and the interviews conducted with the eight volunteers from the experimental groups.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to investigate the effect of *Getting Things Done*™ (GTD) software on the motivation and self-regulation of pre-service teachers in an introductory Educational Technology course. The following research question was addressed: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation? This chapter will describe the sample, the data analysis, and the results of the quantitative and qualitative data collected during the course of the study.

A pre-test/post-test design was used to collect data from the two comparison groups. Comparison groups consisted of a control group and an experimental group of pre-service teachers enrolled in different sections of a required instructional course. Subjects first completed the Motivated Strategies Learning Questionnaire (MSLQ). Additionally, a Likert-Type Scale survey with open-ended short answer/essay questions was administered to all participants so they could self-assess their skill level, their comfort with technology, and their classroom experiences. These surveys were administered at both the beginning and end of the research cycle. To enhance the results gathered through the surveys, qualitative data was collected through semi-structured

interviews conducted with eight randomly selected students participating in the experimental groups. Two students from each of the experimental groups (classes) were interviewed. No students from the control groups were interviewed because the researcher discovered that the majority of the interview questions focused only on the GTD software utilized during the study instead of the concepts the software reinforced.

Paired sample t-tests were used to investigate pre- and post-test means between the variables and independent samples t-tests were conducted to look at the difference in means between the control groups and the experimental groups. Pearson bivariate correlations were performed for pre- and post-test variables and control and experimental groups. For consistency in this study, the researcher and the researcher's co-chair chose the following levels for interpreting r^2 in the Pearson bivariate correlations: low 10%, moderate 15% - 40%, and high 50% and higher. Open-ended questions and interview results were transcribed and analyzed for common themes.

Chapter 4 will first present participant information, including demographic characteristics of the students who participated in the study. The research question: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation, will be addressed first through the presentation of quantitative and then, qualitative data.

Participant Demographic Information

A total of ninety pre-service teachers completed both the pre- and post-test survey questionnaires, forty-five students in the experimental groups and forty-five in the control groups. Only pre-service education teacher data was included in the results. Students with other majors were enrolled the course and all students were allowed to complete the

instruments to avoid any negative effects on the data collection process. However, the data from other majors was excluded from the final data analysis. Table 4.1 presents the control and experimental groups gender summaries.

Table 4.1

Gender Summary

	Control groups		Experimental groups	
Gender	*N*	%	*N*	%
Male	14	31%	18	40%
Female	31	69%	27	60%

The average age of the control groups was 21.31 (*SD* 1.81) and the ages of the students ranged from 19 to 31. The average age of the experimental groups was 22.87 (*SD* 4.94) and the ages ranged from 19 to 44. Median age for the control groups was 21 years and median age for the experimental groups was also 21 years. Students in the control groups had spent an average of 2.67 (*SD* 0.94) years in college. Students in the experimental groups had spent 2.73 years in college (*SD* 1.25).

The control groups' grade classification distribution was 13% sophomores, 49% juniors, and 38% seniors. The experimental groups' grade classification percentages were 11% sophomores, 69% juniors and 20% seniors. Within the control groups, 42% of students were Elementary Education majors and 58% were Secondary Education majors. Within the experimental groups, 33% were Elementary Education majors and 67% were Secondary Education majors.

Analysis of MSLQ Data

After data was collected, numbers from each subject's MSLQ were entered into an excel spreadsheet and mean scores from each of the seven subscales used in the study was calculated for each subject. The subscale means for each person was entered into statistical analysis software (SPSS, version 17). Paired sample t-tests were calculated for each subscale variable at the 95% confidence interval. Additionally, paired sample correlations, means, standard deviations, and Pearson bivariate correlations between the variables were calculated. Following the analysis of paired sample t-tests, independent samples t-tests were calculated between the experimental and the control groups to compare post-test means. Means, standard deviations, and Pearson bivariate correlations between the variables were also calculated.

Paired sample t-test experimental groups.

Table 4.2 presents the means, standard deviations, and pre- and post-test correlations with corresponding significance of the pre- and post-test scales for the experimental groups.

Table 4.2

Paired Sample Descriptive Statistics Experimental Groups

	Pre-Test Mean (*SD*) (*n* = 45)	Post-Test Mean (*SD*) (*n* = 45)	Pre- and Post-Correlations	Sig.
Task Value	6.09 (0.84)	6.08 (0.92)	0.452	0.002*
Control Learning Beliefs	6.22 (0.72)	5.90 (1.17)	0.573	0.000*
Self-Efficacy for Learning and Performance	5.92 (0.68)	5.91 (0.74)	0.508	0.000*
Organization	3.64 (1.46)	3.15 (1.55)	0.813	0.000*
Metacognitive Self-Regulation	4.30 (0.94)	4.05 (0.97)	0.738	0.000*
Time and Study Environment	5.36 (0.84)	4.87 (1.29)	0.632	0.000*
Effort Regulation	5.73 (0.87)	5.42 (1.13)	0.537	0.000*

Note. Responses to scale items were on a 7-point Likert scale, with responses ranging from 1 - not true at all of me to 7 - very true of me.
*p < .05 statistically significant

Table 4.3 presents paired differences descriptive statistics for the pre- and post-test scales of the experimental groups.

Table 4.3

Paired Sample Paired Differences Experimental Groups

	Paired Differences							
	Mean	*SD*	Std. Error Mean	95% CI Lower	95% CI Upper	*t*	*df*	Sig. (2-tailed)
Pair 1 Pre/Post Task Value	.011	.925	.138	-.267	.289	.081	44	.936
Pair 2 Pre/Post Control Learning Beliefs	.318	.963	.143	.028	.607	2.21	44	.032*
Pair 3 Pre/Post Self-Efficacy for Learning and Performance	.007	.705	.105	-.205	.219	.070	44	.945
Pair 4 Pre/Post Organization	.494	.922	.138	.217	.771	3.60	44	.001*
Pair 5 Pre/Post Metacognitive Self-Regulation	.250	.693	.103	.413	.458	2.42	44	.020*
Pair 6 Pre/Post Time and Study Environment	.491	.999	.149	.191	.791	3.30	44	.002*
Pair 7 Pre/Post Effort Regulation	.317	.988	.147	.020	.613	2.15	44	.037*

*p < .05 statistically significant

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Task Value scale. Descriptive indices, including

paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Task Value scale, results were not statistically significant at the 95% confidence level, $t(44) = .081$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .45$, $p < .002$) between Task Value pre-test and Task Value post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Control of Learning Beliefs scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Control of Learning Beliefs scale, results were statistically significant at the 95% confidence level, $t(44) = 2.210$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .573$, $p < .000$) between Control of Learning Beliefs pre-test and Control of Learning Beliefs post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Self-Efficacy for Learning and Performance scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Self-Efficacy for Learning and Performance scale, results were not statistically significant at the 95% confidence level, $t(44) = .070$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .508$, $p < .000$) between Self-Efficacy for Learning and Performance pre-test and Self-Efficacy for Learning and Performance post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Organization scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of

interest were also calculated. For the Organization scale, results were statistically significant at the 95% confidence level, $t(44) = 3.596$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .813$, $p < .000$) between Organization pre-test and Organization post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Metacognitive Self-Regulation scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Metacognitive Self-Regulation scale, results were statistically significant at the 95% confidence level, $t(44) = 2.415$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .738$, $p < .000$) between Metacognitive Self-Regulation pre-test and Metacognitive Self-Regulation post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Time and Study Environment scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For Time and Study Environment scale, results were statistically significant at the 95% confidence level, $t(44) = 3.301$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .632$, $p < .000$) between Time and Study Environment pre-test and Time and Study Environment post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Effort Regulation scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of

interest were also calculated. For the Effort Regulation scale, results were statistically significant at the 95% confidence level, $t(44) = 2.151$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .537$, $p < .000$) between Effort Regulation pre-test and Effort Regulation post-test.

Paired sample t-test control groups.

Table 4.4 presents the means, standard deviations, and pre- and post-test correlations with corresponding significance of the pre- and post-test scales for the control groups.

Table 4.4

Paired Sample Descriptive Statistics Control Groups

	Pre-Test Mean (*SD*) (*n*=45)	Post-Test Mean (*SD*) (*n*=45)	Pre- and Post-Correlations	Sig.
Task Value	5.89 (0.96)	5.96 (0.97)	0.522	0.000*
Control Learning Beliefs	5.71 (0.97)	5.51 (1.23)	0.542	0.000*
Self-Efficacy for Learning and Performance	5.99 (0.71)	6.08 (0.85)	0.565	0.000*
Organization	3.71 (1.39)	3.28 (1.32)	0.493	0.001*
Metacognitive Self-Regulation	4.31 (0.84)	4.02 (1.03)	0.632	0.000*
Time and Study Environment	5.46 (0.68)	4.80 (1.02)	0.419	0.004*
Effort Regulation	5.36 (0.87)	5.14 (1.12)	0.320	0.032*

Note. Responses to scale items were on a 7-point Likert scale with responses ranging from 1 - not true at all of me to 7 - very true of me.
*p < .05 statistically significant

Table 4.5 presents paired differences descriptive statistics for the pre- and post-test scales of the control groups.

Table 4.5

Paired Sample Paired Differences Control Groups

	Paired Differences							
	Mean	*SD*	Std. Error Mean	95% CI Lower	95% CI Upper	*t*	*df*	Sig. (2-tailed)
Pair 1 Pre/Post Task Value	-.072	.944	.141	-.356	.211	-.513	44	.610
Pair 2 Pre/Post Control Learning Beliefs	.199	1.08	.160	-.124	.523	1.243	44	.221
Pair 3 Pre/Post Self-Efficacy for Learning and Performance	-.086	.736	.110	-.307	.135	-.780	44	.439
Pair 4 Pre/Post Organization	.428	1.36	.204	.017	.838	2.101	44	.041*
Pair 5 Pre/Post Metacognitive Self-Regulation	.293	.816	.122	.048	.539	2.411	44	.020*
Pair 6 Pre/Post Time and Study Environment	.662	.961	.143	.373	.950	4.623	44	.000*
Pair 7 Pre/Post Effort Regulation	.211	1.18	.176	-.143	.565	1.202	44	.236

*p < .05 statistically significant

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Task Value scale. Descriptive indices, including paired

sample correlations, means and standard deviations for the variables of interest were also calculated. For the Task Value scale, results were not statistically significant at the 95% confidence level, $t(44) = -.513$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .522$, $p < .000$) between Task Value pre-test and Task Value post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Control of Learning Beliefs scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Control of Learning Beliefs scale, results were not statistically significant at the 95% confidence level, $t(44) = 1.243$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .542$, $p < .000$) between Control of Learning Beliefs pre-test and Control of Learning Beliefs post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Self-Efficacy for Learning and Performance scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Self-Efficacy for Learning and Performance scale, results were not statistically significant at the 95% confidence level, $t(44) = -.780$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .565$, $p < .000$) between Self-Efficacy for Learning and Performance pre-test and Self-Efficacy for Learning and Performance post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Organization scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest

were also calculated. For the Organization scale, results were statistically significant at the 95% confidence level, $t(44) = 2.101$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .493$, $p < .001$) between Organization pre-test and Organization post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Metacognitive Self-Regulation scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Metacognitive Self-Regulation scale, results were statistically significant at the 95% confidence level, $t(44) = 2.411$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .632$, $p < .000$) between Metacognitive Self-Regulation pre-test and Metacognitive Self-Regulation post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Time and Study Environment scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For Time and Study Environment scale, results were statistically significant at the 95% confidence level, $t(44) = 4.623$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .419$, $p < .004$) between Time and Study Environment pre-test and Time and Study Environment post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Effort Regulation scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest

were also calculated. For the Effort Regulation scale, results were not statistically significant at the 95% confidence level, $t(44) = 1.202$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .320$, $p < .032$) between Effort Regulation pre-test and Effort Regulation post-test.

Pearson bivariate correlations experimental groups.

Pearson bivariate correlations were calculated to determine the strength of the relationship between the post-test experimental groups' variables. Table 4.6 presents the descriptive indices for the Pearson bivariate correlations, post-test variables for the experimental groups.

Table 4.6

Pearson Bivariate Correlations Post-test Variables Experimental Groups

	Means	*SD*	*r*	r^2	*df*	Sig. (2-tailed)
Pair 1 Control Learning Beliefs and Effort Regulation	5.90 5.42	1.17 1.13	0.337	0.114	43	0.024*
Pair 2 Control Learning Beliefs and Metacognitive Self-Regulation	5.90 4.05	1.17 0.97	0.484	0.234	43	0.001*
Pair 3 Control Learning Beliefs and Organization	5.90 3.15	1.17 1.55	0.459	0.211	43	0.002*
Pair 4 Control Learning Beliefs and Self-Efficacy	5.90 5.91	1.17 0.74	0.437	0.191	43	0.003*
Pair 5 Control Learning Beliefs and Task Value	5.90 6.08	1.17 0.92	0.521	0.271	43	0.000*
Pair 6 Control Learning Beliefs and Time and Study Environment	5.90 4.87	1.17 1.29	0.217	0.047	43	0.151
Pair 7 Effort Regulation and Metacognitive Self-Regulation	5.42 4.05	1.13 0.97	0.408	0.166	43	0.005*

Pair 8 Effort Regulation and Organization	5.42 3.15	1.13 1.55	0.354	0.125	43	0.017*
Pair 9 Effort Regulation and Self-Efficacy	5.42 5.91	1.13 0.74	0.530	0.281	43	0.000*
Pair 10 Effort Regulation and Task Value	5.42 6.08	1.13 0.92	0.330	0.109	43	0.027*
Pair 11 Effort Regulation and Time and Study Environment	5.42 4.87	1.13 1.29	0.561	0.315	43	0.000*
Pair 12 Metacognitive Self-Regulation and Organization	4.05 3.15	0.97 1.55	0.721	0.520	43	0.000*
Pair 13 Metacognitive Self-Regulation Self-Efficacy	4.05 5.91	0.97 0.74	0.347	0.120	43	0.019*
Pair 14 Metacognitive Self-Regulation and Task Value	4.05 6.08	0.97 0.92	0.374	0.140	43	0.011*
Pair 15 Metacognitive Self-Regulation and Time and Study Environment	4.05 4.87	0.97 1.29	0.311	0.097	43	0.038*
Pair 16 Organization and Self-Efficacy	3.15 5.91	1.55 0.74	0.211	0.045	43	0.163
Pair 17 Organization and Task Value	3.15 6.08	1.55 0.92	0.267	0.071	43	0.076
Pair 18 Organization and Time and Study Environment	3.15 4.87	1.55 1.29	0.342	0.117	43	0.021*
Pair 19 Self-Efficacy and Task Value	5.91 6.08	0.74 0.92	0.484	0.234	43	0.001*
Pair 20 Self-Efficacy and Time and Study Environment	5.91 4.87	0.74 1.29	0.358	0.128	43	0.016*
Pair 21 Task Value and Time and Study Environment	6.08 4.87	0.92 1.29	0.098	0.010	43	0.522

*p < .05 statistically significant

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Metacognitive Self-Regulation. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .484$, $p < .001$. This indicates that 23.4% of the variance between the variables was shared, $r^2 = .234$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .459$, $p < .002$. This indicates that 21.1% of the variance between the variables was shared, $r^2 = .211$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Self-Efficacy. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .437$, $p < .003$. This indicates that 19.1% of the variance between the variables was shared, $r^2 = .191$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Task Value. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate

positive correlation, $r(43) = .521$, $p < .000$. This indicates that 27.1% of the variance between the variables was shared, $r^2 = .271$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Effort Regulation and Metacognitive Self-Regulation. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .408$, $p < .005$. This indicates that 16.6% of the variance between the variables was shared, $r^2 = .166$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Effort Regulation and Self-Efficacy. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .530$, $p < .000$. This indicates that 28.1% of the variance between the variables was shared, $r^2 = .281$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Effort Regulation and Time and Study Environment. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .561$, $p < .000$. This indicates that 31.5% of the variance between the variables was shared, $r^2 = .315$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Metacognitive Self-Regulation and Organization. Descriptive indices, including means and standard

deviations for the variables of interest were also calculated. The two variables demonstrated a high positive correlation, $r(43) = .721$, $p < .000$. This indicates that 52.0% of the variance between the variables was shared, $r^2 = .520$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Self-Efficacy and Task Value. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .484$, $p < .001$. This indicates that 23.4% of the variance between the variables was shared, $r^2 = .234$.

Pearson bivariate correlations control groups.

Pearson bivariate correlations were calculated to determine the strength of the relationship between the post-test control groups' variables. Table 4.7 presents the descriptive indices for the Pearson bivariate correlations, post-test variables for the control groups.

Table 4.7

Pearson Bivariate Correlations Post-test Variables Control Groups

	Means	*SD*	*r*	r^2	*df*	Sig. (2-tailed)
Pair 1 Control Learning Beliefs and Effort Regulation	5.51 5.14	1.23 1.12	0.497	0.247	43	0.001*
Pair 2 Control Learning Beliefs and Metacognitive Self-Regulation	5.51 4.02	1.23 1.03	0.200	0.040	43	0.188
Pair 3 Control Learning Beliefs and Organization	5.51 3.28	1.23 1.32	0.120	0.014	43	0.431
Pair 4 Control Learning Beliefs and Self-Efficacy	5.51 6.08	1.23 0.85	0.571	0.326	43	0.000*

Pair 5 Control Learning Beliefs and Task Value	5.51 5.96	1.23 0.97	0.479	0.229	43	0.001*
Pair 6 Control Learning Beliefs and Time and Study Environment	5.51 4.80	1.23 1.02	0.321	0.103	43	0.032*
Pair 7 Effort Regulation and Metacognitive Self-Regulation	5.14 4.02	1.12 1.03	0.526	0.277	43	0.000*
Pair 8 Effort Regulation and Organization	5.14 3.28	1.12 1.32	0.080	0.006	43	0.601
Pair 9 Effort Regulation and Self-Efficacy	5.14 6.08	1.12 0.85	0.587	0.345	43	0.000*
Pair 10 Effort Regulation and Task Value	5.14 5.96	1.12 0.97	0.286	0.082	43	0.056
Pair 11 Effort Regulation and Time and Study Environment	5.14 4.80	1.12 1.02	0.611	0.373	43	0.000*
Pair 12 Metacognitive Self-Regulation and Organization	4.02 3.28	1.03 1.32	0.531	0.282	43	0.000*
Pair 13 Metacognitive Self-Regulation Self-Efficacy	4.02 6.08	1.03 0.85	0.184	0.034	43	0.227
Pair 14 Metacognitive Self-Regulation and Task Value	4.02 5.96	1.03 0.97	0.180	0.032	43	0.238
Pair 15 Metacognitive Self-Regulation and Time and Study Environment	4.02 4.80	1.03 1.02	0.546	0.298	43	0.000*
Pair 16 Organization and Self-Efficacy	3.28 6.08	1.32 0.85	0.087	0.008	43	0.569
Pair 17 Organization and Task Value	3.28 5.96	1.32 0.97	-0.010	0.0001	43	0.948
Pair 18 Organization and Time and Study Environment	3.28 4.80	1.32 1.02	0.378	0.143	43	0.010*

Pair 19 Self-Efficacy and Task Value	6.08 5.96	0.85 0.97	0.505	0.255	43	0.000*
Pair 20 Self-Efficacy and Time and Study Environment	6.08 4.80	0.85 1.02	0.159	0.025	43	0.297
Pair 21 Task Value and Time and Study Environment	5.96 4.80	0.97 1.02	0.074	0.005	43	0.627

*p < .05 statistically significant

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Effort Regulation. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .497$, $p < .001$. This indicates that 24.7% of the variance between the variables was shared, $r^2 = .247$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Self-Efficacy. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .571$, $p < .000$. This indicates that 32.6% of the variance between the variables was shared, $r^2 = .326$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Control of Learning Beliefs and Task Value. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .479$, $p < .001$. This indicates that 22.9% of the variance between the variables was shared, $r^2 = .229$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Effort Regulation and Metacognitive Self-Regulation. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .526$, $p < .000$. This indicates that 27.7% of the variance between the variables was shared, $r^2 = .277$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Effort Regulation and Self-Efficacy. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .587$, $p < .000$. This indicates that 34.5% of the variance between the variables was shared, $r^2 = .345$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Effort Regulation and Time and Study Environment. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .611$, $p < .000$. This indicates that 37.3% of the variance between the variables was shared, $r^2 = .373$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Metacognitive Self-Regulation and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables

demonstrated a moderate positive correlation, $r(43) = .531$, $p < .000$. This indicates that 28.2% of the variance between the variables was shared, $r^2 = .282$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Metacognitive Self-Regulation and Time and Study Environment. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .546$, $p < .000$. This indicates that 29.8% of the variance between the variables was shared, $r^2 = .298$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Self-Efficacy and Task Value. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .505$, $p < .000$. This indicates that 25.5% of the variance between the variables was shared, $r^2 = .255$.

Independent samples t-test.

An independent samples t-test was calculated to compare the post-test mean score of the experimental and control MSLQ scale variables.

Table 4.8 presents the means, standard deviations, degrees of freedom, and significance level for the results. Each of the independent samples t-test results had a significance greater than .05 in Levene's test for equality of variance, so the top row of the SPSS data output was utilized in the reporting.

Table 4.8

Independent Samples Descriptive Statistics

	Experimental Mean (*SD*) (*n* = 45)	Control Mean (*SD*) (*n* = 45)	*t*	*df*	Sig.
Task Value	6.08 (0.92)	5.96 (0.97)	.585	88	.560
Control Learning Beliefs	5.90 (1.17)	5.51 (1.23)	1.54	88	.128
Self-Efficacy for Learning and Performance	5.91 (0.74)	6.08 (0.85)	-.991	88	.325
Organization	3.15 (1.55)	3.28 (1.32)	-.440	88	.661
Metacognitive Self-Regulation	4.05 (0.97)	4.02 (1.03)	.130	88	.897
Time and Study Environment	4.87 (1.29)	4.80 (1.02)	.261	88	.795
Effort Regulation	5.42 (1.13)	5.14 (1.12)	1.15	88	.254

Note. Responses to scale items were on a 7-point Likert scale, with responses ranging from 1 - not true at all of me to 7 - very true of me.
*p < .05 statistically significant

An independent samples t-test was calculated comparing the post-test mean score of the Task Value Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = .585$, $p > .05$). The mean of the experimental groups ($m = 6.08$, $SD = 0.92$) was not significantly different from the mean of the control groups ($m = 5.96$, $SD = 0.97$).

An independent samples t-test was calculated comparing the post-test mean score of the Control of Learning Beliefs Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = 1.54$, $p > .05$). The mean of the

experimental groups (m = 5.90, SD = 1.17) was not significantly different from the mean of the control groups (m = 5.51, SD = 1.23).

An independent samples t-test was calculated comparing the post-test mean score of the Self-Efficacy for Learning and Performance Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = -.991$, $p > .05$). The mean of the experimental groups (m = 5.91, SD = 0.74) was not significantly different from the mean of the control groups (m = 6.08, SD = 0.85).

An independent samples t-test was calculated comparing the post-test mean score of the Organization Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = -.440$, $p > .05$). The mean of the experimental groups (m = 3.15, SD = 1.55) was not significantly different from the mean of the control groups (m = 3.28, SD = 1.32).

An independent-samples t-test was calculated comparing the post-test mean score of the Metacognitive Self-Regulation Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = .130$, $p > .05$). The mean of the experimental groups (m = 4.05, SD = 0.97) was not significantly different from the mean of the control groups (m = 4.02, SD = 1.03).

An independent samples t-test was calculated comparing the post-test mean score of the Time and Study Environment Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = .261$, $p > .05$). The mean of the experimental groups (m = 4.87, SD = 1.29) was not significantly different from the mean of the control groups (m = 4.80, SD = 1.02).

An independent samples t-test was calculated comparing the post-test mean score of the Effort Regulation Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = .1.15$, $p > .05$). The mean of the experimental groups ($m = 5.42$, $SD = 1.13$) was not significantly different from the mean of the control groups ($m = 5.14$, $SD = 1.12$).

Pearson bivariate correlations between experimental and control groups.

Pearson bivariate correlations were calculated to determine the strength of the relationship between the post-test control groups and experimental groups' variables. There were two significant correlations found in the forty-nine calculations. Table 4.9 presents the results.

Table 4.9
Pearson Bivariate Correlations Experimental and Control Groups Post-Test

Post Control	CLB Post Exp.	ER Post Exp.	MCSR Post Exp.	Org Post Exp.	Self-Eff. Post Exp.	Tsk Vle. Post Exp.	Time Study Post Exp.
Control Learning Beliefs	.031	.135	.027	-.006	-.037	.143	.121
Effort Regulation	.193	.181	-.069	.118	-.244	-.033	.150
Metacognitive Self-Reg.	.094	-.129	-.027	.040	-.384*	-.080	-.132
Organization	-.006	-.180	.010	.028	-.078	-.046	-.062
Self-Efficacy	.204	.053	.142	.002	.037	.184	.109
Task Value	.002	-.164	.084	-.022	-.036	-.028	-.204
Time Study Environment	.114	.042	.134	.338*	-.222	-.111	-.235

*p < .05 statistically significant

Table 4.10 presents the descriptive indices for the Pearson bivariate correlations, post-test variables for the two statistically significant correlations.

Table 4.10

Descriptive Indices for Statistically Significant Post-test Variables

	Means	*SD*	*r*	r^2	*df*	Sig. (2-tailed)
Pair 1 Metacognitive Self-Regulation control and Self-Efficacy experimental	4.02 5.91	1.03 0.74	-0.384	0.147	43	0.009*
Pair 2 Time and Study Environment control and Organization experimental	4.80 3.15	1.02 1.55	0.338	0.114	43	0.023*

*p < .05 statistically significant

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Metacognitive Self-Regulation control and Self-Efficacy experimental. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a low negative correlation, $r(43) = -.384$, $p < .01$. This indicates that 14.7% of the variance between the variables was shared, $r^2 = .147$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Time and Study Environment control and Organization experimental. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a low positive correlation, $r(43) = .338$, $p < .05$. This indicates that 11.4% of the variance between the variables was shared, $r^2 = .114$.

Analysis of Skill Level Likert-Type Scale Data

After data was collected, numbers from each subject's Skill Level Likert-type Scale questionnaire were entered into an excel spreadsheet and mean scores for each of the five subscales used in the study was calculated for each subject. The subscale means for each person was entered into statistical analysis software (SPSS, version 17). Paired sample t-tests were calculated for each subscale variable at the 95% confidence interval. Additionally, paired sample correlations, means, standard deviations, and Pearson bivariate correlations between the variables were calculated. Following the analysis of paired sample t-tests, independent samples t-tests were calculated between the experimental and the control groups to compare post-test means. Means, standard deviations, and Pearson bivariate correlations between the variables were also calculated.

Paired sample t-test experimental groups.

Table 4.11 presents the means, standard deviations, and pre- and post-test correlations with corresponding significance of the pre- and post-test scales for the experimental groups.

Table 4.11

Paired Sample Descriptive Statistics Experimental Groups

	Pre-Test Mean (*SD*) (*n* = 45)	Post-Test Mean (*SD*) (*n* = 45)	Pre & Post Correlations	Significance
Ability	2.13 (0.79)	1.87 (0.76)	0.260	0.850
Comfort	2.71 (0.82)	2.31 (0.67)	0.628	0.000*
Motivation	1.80 (0.79)	2.22 (0.74)	0.315	0.035*
Organization	2.33 (0.74)	2.47 (0.99)	0.311	0.038*
Proficiency	2.82 (0.78)	2.42 (0.62)	0.489	0.001*

Note. Responses to scale items were on a 5-point Likert-type scale, with responses ranging from 1 – very high to 5 - very low.
*p < .05 statistically significant

Table 4.12 presents paired differences descriptive statistics for the pre- and post-test scales of the experimental groups.

Table 4.12

Paired Sample Paired Differences Experimental Groups

	Paired Differences							
	Mean	*SD*	Std. Error Mean	95% CI Lower	95% CI Upper	*t*	*df*	Sig (2-tailed)
Pair 1 Pre/Post Ability	0.267	0.94	0.14	-0.15	0.55	1.905	44	.063
Pair 2 Pre/Post Comfort	0.400	0.65	0.10	0.20	0.60	4.105	44	.000*
Pair 3 Pre/Post Motivation	-0.422	0.89	0.13	-0.69	-0.15	-3.177	44	.003*
Pair 4 Pre/Post Organization	-0.133	1.04	0.15	-0.44	0.18	-0.864	44	.393
Pair 5 Pre/Post Proficiency	0.400	0.72	0.11	0.18	0.62	3.728	44	.001*

*p < .05 statistically significant

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Ability scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Ability scale, results were not statistically significant at the 95% confidence level, $t(44) = 1.905$, $p > .05$. Paired sample correlations revealed no significant correlation ($r = .26$, $p < .085$) between Ability pre-test and Ability post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Comfort scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Comfort scale, results were statistically significant at the

95% confidence level, $t(44) = 4.105$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .628$, $p < .000$) between Comfort pre-test and Comfort post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Motivation scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Motivation scale, results were statistically significant at the 95% confidence level, $t(44) = -3.177$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .315$, $p < .035$) between Motivation pre-test and Motivation post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Organization scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Organization scale, results were not statistically significant at the 95% confidence level, $t(44) = -0.864$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .311$, $p < .038$) between Organization pre-test and Organization post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the experimental groups' Proficiency scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Proficiency scale, results were statistically significant at the 95% confidence level, $t(44) = 3.728$, $p < .05$. Paired sample correlations revealed a

significant positive correlation ($r = .486$, $p < .001$) between Proficiency pre-test and Proficiency post-test.

Paired sample t-test control groups.

Table 4.13 presents the means, standard deviations, and pre- and post-test correlations with corresponding significance of the pre- and post-test scales for the control groups.

Table 4.13

Paired Sample Descriptive Statistics Control Groups

	Pre-Test Mean (*SD*) (*n* = 45)	Post-Test Mean (*SD*) (*n* = 45)	Pre & Post Correlations	Significance
Ability	1.98 (0.72)	1.71 (0.69)	0.485	0.001*
Comfort	2.82 (0.58)	2.49 (0.59)	0.531	0.000*
Motivation	1.80 (0.76)	2.24 (0.83)	0.333	0.025*
Organization	2.18 (0.68)	2.33 (0.85)	0.403	0.006*
Proficiency	2.82 (0.53)	2.51 (0.63)	0.617	0.000*

Note. Responses to scale items were on a 5-point Likert-type scale, with responses ranging from 1 – very high to 5 - very low.
*p < .05 statistically significant

Table 4.14 presents paired differences descriptive statistics for the pre- and post-test scales of the control groups.

Table 4.14

Paired Sample Paired Differences Control Groups

	Paired Differences							
	Mean	*SD*	Std. Error Mean	95% CI Lower	95% CI Upper	*t*	*df*	Sig (2-tailed)
Pair 1 Pre/Post Ability	0.267	0.72	0.11	0.05	0.48	2.485	44	.017*
Pair 2 Pre/Post Comfort	0.333	0.56	0.08	0.16	0.50	3.964	44	.000*
Pair 3 Pre/Post Motivation	-0.444	0.92	0.14	-0.72	-0.17	-3.246	44	.002*
Pair 4 Pre/Post Organization	-0.155	0.85	0.13	-0.41	0.10	-1.225	44	.227
Pair 5 Pre/Post Proficiency	0.311	0.51	0.08	0.16	0.47	4.057	44	.000*

*p < .05 statistically significant

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Ability scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Ability scale, results were statistically significant at the 95% confidence level, $t(44) = 2.485$, $p < .05$. Paired sample correlations revealed a significant correlation ($r = .485$, $p < .001$) between Ability pre-test and Ability post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Comfort scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Comfort scale, results were statistically significant at the 95%

confidence level, $t(44) = 3.964$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .531$, $p < .000$) between Comfort pre-test and Comfort post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Motivation scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Motivation scale, results were statistically significant at the 95% confidence level, $t(44) = -3.246$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .333$, $p < .025$) between Motivation pre-test and Motivation post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Organization scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Organization scale, results were not statistically significant at the 95% confidence level, $t(44) = -1.225$, $p > .05$. Paired sample correlations revealed a significant positive correlation ($r = .403$, $p < .006$) between Organization pre-test and Organization post-test.

A paired sample t-test was calculated to compare the mean of the pre- and post-test results of the control groups' Proficiency scale. Descriptive indices, including paired sample correlations, means and standard deviations for the variables of interest were also calculated. For the Proficiency scale, results were statistically significant at the 95% confidence level, $t(44) = 4.057$, $p < .05$. Paired sample correlations revealed a significant positive correlation ($r = .617$, $p < .000$) between Proficiency pre-test and Proficiency post-test.

Pearson bivariate correlations experimental groups.

Pearson bivariate correlations were calculated to determine the strength and direction of the shared variation between pairs of post-test variables for the experimental groups. Descriptive indices, including means and standard deviations for the pairs of variables were also calculated.

Based on the results, only the pairings of Ability/Proficiency (r^2 = 0.259) and Motivation/Organization (r^2 = 0.364) demonstrated that more than 25% of the variance was attributed to differences between the two variables. Table 4.15 presents the descriptive indices for the Pearson bivariate correlations, post-test variables for the experimental groups.

Table 4.15

Pearson Bivariate Correlations Post-test Variables Experimental Groups

	Means	*SD*	*r*	r^2	% of variance	*df*	Sig (2-tailed)
Pair 1 Ability and Comfort	1.87 2.31	0.76 0.67	0.097	0.009	0.9%	43	0.532
Pair 2 Ability and Motivation	1.87 2.22	0.76 0.74	0.177	0.031	3.1%	43	0.245
Pair 3 Ability and Organization	1.87 2.47	0.76 0.99	0.327	0.107	10.7%	43	0.028*
Pair 4 Ability and Proficiency	1.87 2.42	0.76 0.62	0.509	0.259	25.9%	43	0.000*
Pair 5 Comfort and Motivation	2.31 2.22	0.67 0.74	-0.185	0.034	3.4%	43	0.228

Pair 6 Comfort and Organization	2.31 2.47	0.67 0.99	-0.136	0.018	1.8%	43	0.378
Pair 7 Comfort and Proficiency	2.31 2.42	0.67 0.62	0.133	0.018	1.8%	43	0.389
Pair 8 Motivation and Organization	2.22 2.47	0.74 0.99	0.603	0.364	36.4%	43	0.000*
Pair 9 Motivation and Proficiency	2.22 2.42	0.74 0.62	0.238	0.057	5.7%	43	0.116
Pair 10 Organization and Proficiency	2.47 2.42	0.99 0.62	0.300	0.090	9.0%	43	0.045*

*p < .05 statistically significant

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Ability and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a low positive correlation, $r(43) = .327$, $p < .028$. This indicates that 10.7% of the variance between the variables was shared, $r^2 = 0.107$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Ability and Proficiency. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .509$, $p < .000$. This indicates that 25.9% of the variance between the variables was shared, $r^2 = 0.259$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Motivation and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .603$, $p < .000$. This indicates that 36.4% of the variance between the variables was shared, $r^2 = 0.364$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Organization and Proficiency. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a low positive correlation, $r(43) = .300$, $p < .045$. This indicates that 9.0% of the variance between the variables was shared, $r^2 = 0.090$.

Pearson bivariate correlations control groups.

Pearson bivariate correlations were calculated to determine the strength and direction of the shared variation between pairs of post-test variables for the control groups.

Based on the results, only the pairings of Ability/Organization ($r^2 = 0.261$), Comfort/Proficiency ($r^2 = 0.719$) and Motivation/Organization ($r^2 = 0.469$) demonstrated that more than 25% of the variance was attributed to differences between the two variables. Table 4.16 presents the descriptive indices for the Pearson bivariate correlations, post-test variables for the control groups.

Table 4.16

Pearson Bivariate Correlations Post-test Variables Control Groups

	Means	*SD*	*r*	r^2	% of variance	*df*	Sig (2-tailed)
Pair 1 Ability and Comfort	1.71 2.49	0.69 0.59	0.298	0.089	8.9%	43	0.047*
Pair 2 Ability and Motivation	1.71 2.24	0.69 0.83	0.440	0.194	19.4%	43	0.002*
Pair 3 Ability and Organization	1.71 2.33	0.69 0.85	0.511	0.261	26.1%	43	0.000*
Pair 4 Ability and Proficiency	1.71 2.51	0.69 0.63	0.399	0.159	15.9%	43	0.007*
Pair 5 Comfort and Motivation	2.49 2.24	0.59 0.83	0.355	0.126	12.6%	43	0.017*
Pair 6 Comfort and Organization	2.49 2.33	0.59 0.85	0.392	0.154	15.4%	43	0.008*
Pair 7 Comfort and Proficiency	2.49 2.51	0.59 0.63	0.848	0.719	71.9%	43	0.000*
Pair 8 Motivation and Organization	2.24 2.33	0.83 0.85	0.685	0.469	46.9%	43	0.000*
Pair 9 Motivation and Proficiency	2.24 2.51	0.83 0.63	0.323	0.104	10.4%	43	0.031*
Pair 10 Organization and Proficiency	2.33 2.51	0.85 0.63	0.355	0.126	12.6%	43	0.017*

*$p < .05$ statistically significant

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Ability and Motivation. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .440$, $p < .002$. This indicates that 19.4% of the variance between the variables was shared, $r^2 = 0.194$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Ability and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .511$, $p < .000$. This indicates that 26.1% of the variance between the variables was shared, $r^2 = 0.261$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Ability and Proficiency. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .399$, $p < .007$. This indicates that 15.9% of the variance between the variables was shared, $r^2 = 0.159$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Comfort and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate

positive correlation, $r(43) = .392$, $p < .008$. This indicates that 15.4% of the variance between the variables was shared, $r^2 = 0.154$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Comfort and Proficiency. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a high positive correlation, $r(43) = .848$, $p < .000$. This indicates that 71.9% of the variance between the variables was shared, $r^2 = 0.719$.

A Pearson bivariate correlation was calculated to determine the strength and direction of the shared variation between the post-test variables, Motivation and Organization. Descriptive indices, including means and standard deviations for the variables of interest were also calculated. The two variables demonstrated a moderate positive correlation, $r(43) = .685$, $p < .000$. This indicates that 46.9% of the variance between the variables was shared, $r^2 = 0.469$.

Independent samples t-test.

An independent samples t-test was calculated to compare the post-test mean score of the experimental groups and control groups Skill Level Likert-type Scale variables.

Table 4.17 presents the means, standard deviations, degrees of freedom, and significance level for the results. Each of the independent samples t-test results had a significance greater than .05 in Levene's test for equality of variance, so the top row of data was utilized in the reporting.

Table 4.17

Independent Samples Descriptive Statistics

	Experimental Mean (*SD*) (*n* = 45)	Control Mean (*SD*) (*n* = 45)	*t*	*df*	Sig.
Ability	1.87 (0.76)	1.71 (0.69)	1.02	88	.313
Comfort	2.31 (0.67)	2.49 (0.59)	-1.34	88	.184
Motivation	2.22 (0.74)	2.24 (0.83)	-.134	88	.893
Organization	2.47 (0.99)	2.33 (0.85)	.684	88	.496
Proficiency	2.42 (0.62)	2.51 (0.63)	-.676	88	.501

Note. Responses to scale items were on a 5-point Likert-type scale, with responses ranging from 1 – very high to 5 - very low.
*p < .05 statistically significant

An independent samples t-test was calculated comparing the post-test mean score of the Ability Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = 1.02$, $p > .05$). The mean of the experimental groups ($m = 1.87$, $SD = 0.76$) was not significantly different from the mean of the control groups ($m = 1.71$, $SD = 0.69$).

An independent samples t-test was calculated comparing the post-test mean score of the Comfort Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = -1.34$, $p > .05$). The mean of the experimental groups ($m = 2.31$, $SD = 0.67$) was not significantly different from the mean of the control groups ($m = 2.49$, $SD = 0.59$).

An independent samples t-test was calculated comparing the post-test mean score of the Motivation Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = -.134$, $p > .05$). The mean of the experimental

groups (m = 2.22, SD = 0.74) was not significantly different from the mean of the control groups (m = 2.24, SD = 0.83).

An independent samples t-test was calculated comparing the post-test mean score of the Organization Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = .684$, $p > .05$). The mean of the experimental groups (m = 2.47, SD = 0.99) was not significantly different from the mean of the control groups (m = 2.33, SD = 0.85).

An independent samples t-test was calculated comparing the post-test mean score of the Proficiency Scale for the experimental groups and the control groups. No significant difference was found ($t(88) = -.676$, $p > .05$). The mean of the experimental groups (m = 2.42, SD = 0.62) was not significantly different from the mean of the control groups (m = 2.51, SD = 0.63).

Pearson bivariate correlations experimental and control groups.

Pearson bivariate correlations were calculated to determine the strength of the relationship between the post-test experimental groups and control groups variables. There were zero significant correlations found in the twenty-five correlations. Table 4.18 presents the results.

Table 4.18

Pearson Bivariate Correlations Experimental and Control Groups Post-test

	Ability Post Exp.	Comfort Post Exp.	Motivation Post Exp.	Org. Post Exp.	Proficiency Post Exp.
Ability Post Control	-.118	.002	.084	.002	-.132
Comfort Post Control	.150	-.107	.058	.068	.044
Motivation Post Control	-.128	-.058	.207	.079	-.072
Organization Post Control	-.106	-.266	.060	.081	-.186
Proficiency Post Control	.099	-.063	-.055	-.064	.017

Analysis of Open-Ended Short Answer Question Data

Experimental groups pre-test self-assessment.

All participants were asked the following question during the pre-test data collection process: How do you plan to organize your time and study environment for this course? Table 4.19 summarizes the responses of the experimental groups. The data is summarized via categorized responses. Totals exceed the number of participants due to multiple responses by participants. One of forty-five participants offered no response.

Table 4.19

Experimental Groups Pre-Test Question Summary

Response	Number Mentioned	Percent Mentioned (out of 44 responses)
Time – Calendar/Planner/Schedule	14	32%
Time – Due Dates	2	5%
Time – Early	5	11%
Time - Daily	5	11%
Time – Time Blocks	7	16%
Time – Free Time	11	25%
Time – No Plans/Other	8	18%
Study Environment – Home	6	14%
Study Environment – School	5	11%
Study Environment – Other	4	9%

Time – Calendar/Planner/Schedule Responses included the following. "I also have scheduled specific study/work times planned into my weekly schedule." "I have set study hall time during the week to do my work." "Make a study schedule to give me

enough time to take in all the material." "I have a marker board at home where I plan out each week to do homework, study and work." "I plan to keep track of all of my assignments in my planner and then mark them off as I have competed them." And "Use of a planner and computer lab time."

Time – Due Date Responses included the following. "Doing everything on time at school." And "Do the work and practice the skill before it is due."

Time – Early Responses included the following. "I want to complete assignments well before they are due so may work is complete and not rushed." "Get the homework done as soon as it is given so I don't forget about it." "I try to complete assignments as early as possible so I'm not rushing to finish, and so I can be thorough and take my time." And "I will organize my time by making sure I give myself plenty of time to complete assignments."

Time – Daily Responses included the following. "I will dedicate some time each day to working on this class work." "I plan to do the same thing I do with other classes, set aside time each day to complete any assignments or reading." "Do a bit of homework each night instead of leaving it all to do the night before it is due." "I keep a couple of hours of my day free to do my homework." And "I try to set aside at least 30 minutes to an hour each day for each class I am in."

Time – Time Blocks Responses included the following. "I tend to study at least an hour a week in a quiet room." "With busy work schedule and personal/family life all school work will be done during the only available time slots, weekends and late nights." "Devote the night before class to review the chapter and work on weekly assignments."

And “By setting certain times aside especially for this class so that I may study the information to help me succeed for this course.”

Time – Free Time Responses included the following. “Take each day as it comes and utilize my free time in order to effectively and efficiently study.” “I’m taking 24 hours so I have a very strict time allotment. I try to use my free time for studying.” And “The same as any other course, do the assigned work and study for tests during my time at my place.”

Time – No Plans/Other Responses included the following. “Attend class daily and keep on top of homework.” “I plan to use all available technology at my disposal to complete this class.” And “I plan to take accurate notes and save them for class use and later use.”

Study Environment – Home Responses included the following. “I will do all my studying between potty training, fixing snacks and meals, and sharing the arm of my chair with my 3 year old…” “Most of my studying will be done in my chair at my desk reading the materials.” And “Since much of this course is done on the computer, I will do most of my work on my laptop at home or on the school computers during breaks.”

Study Environment – School Responses included the following. “Doing everything on time at school.” “I plan to finish as much as I can in class and with the remaining work that needs to be done, I plan on going to the computer lab after all my classes to finish the assignments.” And “Use of a planner and computer lab time.”

Study Environment – Other Responses included the following. “Proper use of D2L, my laptop and travel time on the bus from A to B.” “I study in environments in

which I feel the most comfortable and appropriate for the topic at hand." And "I have set study hall time during the week to do my work." (D2L is the online course platform.)

Experimental groups post-test self-assessment.

All participants were asked the following question during the post-test data collection process: Was there anything you learned or experienced in this course that helped you to organize your time and study environment for this class? The data is summarized via categorized responses. Totals exceed the number of participants due to multiple responses by participants. Nine of the forty-five participants offered no response. Table 4.20 summarizes responses.

Table 4.20

Experimental Groups Post-Test Question Summary

Response	Number Mentioned	Percent Mentioned (out of 36 responses)
Online Calendar	10	28%
D2L Online Calendar	4	11%
iGoogle™	6	17%
Remember the Milk	2	6%
General Comments	3	8%
Microsoft Office	6	17%
Time Management	3	8%
Did not learn anything useful	5	14%

Online Calendar Responses included the following. "The online Google calendar and to-do lists." "The calendar activities have been helpful." "All of the sites we were given with calendars and information really helped me focus and organize." "Calendars

are a great way to organize either one or more classes." And "…the use of the class calendar was a great help! I wish all teachers used it."

D2L Online Calendar Responses included the following. ""The calendar on D2L was very helpful." "As the course went on, I learned to actually check the D2L website every day in order to stay on top of the class." "I liked having the calendar on D2L. It was very helpful having the instructor post deadlines. I found it easier to manage the content by the way it was outlined for me in the content section of D2L. I really wish more professors used D2L to its full advantage, like this class."

iGoogle™ Responses included the following. "iGoogle™ was useful." "iGoogle™ helped me so much!" "iGoogle™ has helped me with organizing what needs to be done in the future." "The set-up of our iGoogle™."

Remember the Milk Responses included the following. "I learned about various calendars and reminder software. I really liked the jeopardy game creation. I will use it in the future. iGoogle™ and Remember the Milk were good as well." "I learned about Remember the Milk but I stuck with my familiar excel spreadsheet method. However, the use of the class calendar was a great help! I wish all teachers used it."

General Online Comments Responses included the following. "A few organizational sites were shown, which would be great for persons who spend vast amounts of time on the computer/Internet." "Many of the links were helpful to me in finding good things to use for organization and other topics."

Microsoft Office Responses included the following. "Yes, I learned how to use Excel which will help me organize several things in the future." "I learned how to use Excel to calculate grades for me." "Learning all the programs and their uses really

helped conserve time. Like using Publisher instead of trying to use Word in difficult ways."

Time Management Responses included the following. "I learned that procrastination is a problem, and I need to manage my time better." "I learned that computers are problematic and it's important to finish things before the last minute so these problems can be corrected if needed."

Did Not Learn Anything Useful Responses included the following. "We learned ways, but none that I would use." "Not really, just skills that I learned through my scholastic career." "Everything I learn in this class I tend to forget about a week later."

Control groups pre-test self-assessment.

All participants were asked the following question during the pre-test data collection process: How do you plan to organize your time and study environment for this course? The following summarizes the responses of the control groups. The data is summarized via categorized responses. Totals exceed the number of participants due to multiple responses by participants. Table 4.21 summarizes the responses.

Table 4.21

Control Groups Pre-Test Question Summary

Response	Number Mentioned	Percent Mentioned (out of 45)
Time - Calendar/Planner/Schedule	7	16%
Time – Due Dates	11	24%
Time – Early	6	13%
Time - Daily	3	7%
Time – Time Blocks	8	18%
Time – Free Time	2	4%
Time – No Plans/Other	9	20%
Study Environment – Home	11	24%
Study Environment – School	4	9%
Study Environment – Other	7	16%

Time – Calendar/Planner/Schedule Responses included the following. "I will organize my time by marking specific times in my day planner to study and do activities for this course." "Make lists of when I need to get things done, keep track of assignments in my planner, and do the work/study when necessary for me to get done in time." "I plan to write in my planner for reading and studying time and I plan on checking D2L every day for new assignments." "Don't overwhelm myself with too many classes. Set scheduled times and places to study."

Time – Due Date Responses included the following. "Finish quizzes and other assignments by the specified deadline." "I'm going to make sure everything is turned in, so in order to do that, I must not forget due dates." "Read the chapters before quizzes." "I

plan to organize my time by keeping up with the assignments. I will do the assignments when it is given." And "Make sure I complete all of my online quizzes at home and on time."

Time – Early Responses included the following. "I will work on my assignments and prepare for projects as early as possible." "I will plan for all assignments ahead of time and use my skills that I have accrued so far in technology." "Manage time by completing all assignments and quizzes on time or ahead of schedule." And "Making sure I do all my quizzes and assignments before the due dates."

Time – Daily Responses included the following. "I set time aside each day for a few minutes to do work for this class. As I do for all of my classes." "Evenings during free time on computer." And "I plan to take time every day to check D2L to look and make sure all my assignments are done or that I have worked on them."

Time – Time Blocks Responses included the following. "I plan to organize my time appropriately in order to have time to study the necessary hours required to pass and highly succeed in this course." "Set 3 hours aside of work time for each class session." "I plan to set aside a certain amount of time per week to study and complete assignments for this course." And "Set aside a certain amount of time a week in which to read over material. Add extra time near exams, quizzes or tests."

Time – Free Time Responses included the following. "I do not have a job which leaves all my spare time available to studying." And "Evenings during free time on computer."

Time – No Plans/Other Responses included the following. "Just have a quiet environment to complete the assignments and study in." "As best I can, because

unfortunately, I am in 20 hours this semester." "I have no plans to organize my time. I know the course requirements and deadlines and can get things done." "I need to stay on top of things because I have a job as well." And "Make sure I keep track of when my assignments are due and give myself accurate time to complete them."

Study Environment – Home Responses included the following. ""My primary study environment will be my home." "My study environment is set up in a spare room where I can isolate myself while doing my work." "Do the assignments when they are assigned at my house." "I plan on getting everything done on time by doing it at home when I am finished with the 19 hours of credit I took on this semester." And "Make sure I complete all of my online quizzes at home and on time."

Study Environment – School Responses included the following. "I plan to organize my study environment by having my apartment quiet or going someplace quiet on campus." "Usually work on my laptop in my room or library." And "I plan to study in my room or in a quiet part of the library."

Study Environment – Other Responses included the following. "I plan to study in an environment that works best for me." "Don't overwhelm myself with too many classes. Set scheduled times and places to study." "Quiet environment where I can study." And "I like to study in quiet areas where I can concentrate on the materials."

Control groups post-test self-assessment.

All participants were asked the following question during the post-test data collection process: Was there anything you learned or experienced in this course that helped you to organize your time and study environment for this class? Table 4.22 summarizes the responses of the control groups. The data is summarized via categorized

responses. Totals exceed the number of participants due to multiple responses by participants. Twenty-one participants offered no response.

Table 4.22

Control Groups Post-Test Question Summary

Response	Number Mentioned	Percent Mentioned (out of 24 responses)
Online Calendar	0	0%
D2L Online Calendar	2	8%
iGoogle™	0	0%
Remember the Milk	0	0%
General Comments	10	42%
Microsoft Office	3	13%
Time Management	4	17%
Did not learn anything useful	3	13%

D2L Online Calendar Responses included the following. "D2L helped a lot." "I liked how our teacher posted everything for the week and what was due that week in the content section of D2L and her outlines on course home and the calendar in D2L."

General Comments Responses included the following. "All of the projects helped with my study environment because I can apply some of them towards how to better organize and plan my lessons." "Stay on top of everything." "Lesson plans." And "I liked doing the entire course online. It helped me stay more organized than usual."

Microsoft Office Responses included the following. "All of the technologies have been extremely useful, but excel has probably helped me out the most." And "Yes, in

excel, I learned a lot about charts and how to do grade sheets for myself which helped me keep track of my grades personally."

Time Management Responses included the following. "I learned that it is important to have specific time set aside for studying/doing assignments in this type of course when you attempt to tack on unrelated assignments during study time, it's easy to get behind or get distracted." "I learned to not put off assignments. I tried to finish the assignments a few days ahead of the due date. I found that this was helpful with the course work." And "Yes, when doing one assignment, I realized that sometimes it works better for me to work on it, then take a break. Then come back to it later to finish up."

Did Not Learn Anything Useful Responses included the following. "No, everything is due on Saturday night, everything gets done Saturday afternoon."

Analysis of Interview Data

A total of eight students in the experimental groups were interviewed following the end-of-the semester data collection process. Two student volunteers from each of the four sections were randomly chosen for interviews. Each interview collected demographic data, self-assessment data and opinion data based on the experiment materials and process. No students from the control groups were interviewed because the researcher discovered that the majority of the interview questions focused only on the GTD software utilized during the study instead of the concepts the software reinforced.

Demographic data.

Of the eight students interviewed, six (75%) were female and two (25%) were male. The ages ranged from 20 to 38, the average age was 26 (*SD* 6.14) and the median age was 23. The grade classification included three (37.5%) seniors, three (37.5%)

juniors, and two (25%) sophomores. Five (62.5%) of the students were Secondary Education majors and three (37.5%) of the students were Elementary Education majors.

Self-assessment data.

Five self-assessment questions were asked of the interviewees. The questions focused on technological proficiency, comfort level with technology, assessment of ability to successfully complete the course, motivation towards the course, and course organizational skills.

The first self-assessment question asked during the interview process: How would you describe your current level of technology proficiency? How has that level changed during the course of the semester? Table 4.23 summarizes the responses.

Table 4.23

Self-Assessment Question 1 Summary

Proficiency Level	Number Mentioned	Percent Mentioned
Above Average	3	37.5%
Average	4	50.0%
Below Average	1	12.5%

The majority of the students described their technology proficiency as average or very good. When asked how that level had changed over the course of the semester, the following responses were given: “Improved.” “Better able to use Excel.” “Learned a lot of tricks.” “Learned things to use as a teacher.” “Learned hints and tips.” “Learned new tools.” “I can use Microsoft programs better now.” and “Proficiency in new areas.”

The second self-assessment question asked during the interview process: How would you describe your current comfort level with technology? How has that changed during the course of the semester? Table 4.24 summarizes the responses.

Table 4.24

Self-Assessment Question 2 Summary

Comfort Level	Number Mentioned	Percent Mentioned
Above Average	3	37.5%
Average	4	50.0%
Below Average	1	12.5%

The majority of the students described their technology proficiency as average or very good. When asked how that level had changed over the course of the semester seven (87.5%) of the eight students reported that their comfort level with technology had improved during the semester. Comments included: “It’s gone up.” “Being able to see all the different links and things out there that can help us along the track too makes it a lot less intimidating.” “I’m more comfortable with Excel.” “I’ve enhanced skills that I already had.” “I have more tools in my tool belt.” and “It doesn’t take me as long anymore.”

The third self-assessment question asked during the interview process: What is your current assessment of your ability to successfully complete this course? How has that changed during the course of the semester? Table 4.25 summarizes the responses.

Table 4.25

Self-Assessment Question 3 Summary

Assessment of Ability to Complete Course	Number Mentioned	Percent Mentioned
Confident in Ability to Complete	8	100%

All students (100%) reported that they felt confident in their ability to successfully complete the course. When asked how their confidence levels had changed over the course of the semester, students reported: "I feel that I've met all of my goals and I've done the best I can." "I didn't accomplish what I thought I could do." and "I feel good because we did the iGoogle™ and we got organized. I learned how to manage my time a little better."

The fourth self-assessment question asked during the interview process: What is your current level of motivation towards this course? How has that changed during the course of the semester? Table 4.26 summarizes the responses.

Table 4.26

Self-Assessment Question 4 Summary

Motivation towards Course	Number Mentioned	Percent Mentioned
High Motivation	5	62.5%
Took Course because Required	3	37.5%

The majority of students (62.5%) felt highly motivated towards the course. Reasons included: "I was really pumped to see how to incorporate different things in the class setting, and I was hoping it wouldn't be just another computer concepts, but it really just completely blew it out of the water, because it was really actually applying it to

specifically to Math." "It sounded like a fun class to me." And "It was really high since this was my first semester coming back." There were several students (37.5%) who took the course because it was a course requirement. Their comments regarding motivation included: "It's required, so I was motivated enough to complete it."

The majority of students (62.5%) still feel motivated towards the course at the end of the semester. Responses included: "At first I was just doing the minimum and trying to get by or whatever, but then I got more interested in the subject and in all the materials and really trying to connect them in more of a creative manner to my subject." "Really motivated at the end, I kind of waddled in the middle a little bit, but now I am pushing toward the end really hard." And "I think that it is going to be more exciting to teach middle school science. Especially with all the technology that I learned in this class."

The final self-assessment question asked during the interview process: What is your current level of organization skills as related to this course? Table 4.27 summarizes the responses.

Table 4.27

Self-Assessment Question 5 Summary

Organizational Skills for the Course	Number Mentioned	Percent Mentioned
Average but Decreased over Semester	2	25.5%
Used D2L to Organize for Course	3	37.5%
Improved over the Semester	1	12.5%
Organized but Difficulty Completing Tasks	1	12.5%
No Organizational Skills for Course	1	12.5%

Comments related to the last assessment question include: “I thought I had really good organizational skills until this semester and I felt like I tried to be organized, but the more I tried, the worse it got.” “It really helped with having the calendar on the D2L and having the assignments placed on that. And with the other classes, I just put those assignments on there too and it was really easy to be organized.” “I have learned how to do our, I learned a lot about time management and organization because we had so much in this class that I kind of had to fit it all in.” “As far as having things organized as what’s due when and all that, I had that under wraps. That was taken care of, it was just finding the time to be able to carry that out.” And “Zero to none.”

Opinion data.

Following the collection of self-assessment data, students were asked a series of questions about their experiences with the *Getting Things Done*™ software and materials as well as how participating in the experiment affected their perceptions of and ability to complete the course materials. Totals exceed the number of participants on several questions due to multiple responses by participants.

The first question asked about *Getting Things Done*™*:* How did the training on the *Getting Things Done*™ method assist you with course material completion? Table 4.28 summarizes the responses.

Table 4.28

Opinion Data Question 1 Summary

How Did Training Assist	Number Mentioned	Percent Mentioned
Helped with Organization	4	50.0%
Helped to Focus on Tasks	3	37.5%
Learned to Use iGoogle™/Calendar	6	75.0%

Comments related to this question include: “I liked the calendar in the D2L system better, because I was already there.” “The calendar that you have, I will go through and get my personal calendar and put what dates things are due and then weekly, I make a to do list of what I am supposed to do that week.” “The iGoogle™ because I put all of my tasks in there.” “The concept of using the calendar, it helped me more than the actual iGoogle™ account, just making the point that you really do need to get organized for this class or you will forget stuff.” “I write stuff down a lot and I use the calendar on D2L a lot.” “I have to write it down and then that way I can go check it off later and then I have a sense of accomplishment.” And “In the sense that I have been using iGoogle™ a whole lot more, since I didn’t even know it existed. I’ve been using some of the stuff that D2L provides that follows the same line of thinking, which has helped organize, especially more lately when I started to get a little behind. Because with my focus wavering, I used those things to kind of help monitor myself because I wasn’t being as adherent in my own brain without the help.”

The second question asked about *Getting Things Done™:* How exactly did you use the *Getting Things Done*™ software during the semester? Table 4.29 summarizes the responses.

Table 4.29

Opinion Data Question 2 Summary

How was GTD Software Utilized	Number Mentioned	Percent Mentioned
Did Not Use during Semester	6	75.0%
Deadlines	1	12.5%
To Do List/Calendar	1	12.5%

Comments related to this question include: "I used them [iGoogle™ and D2L] for deadlines. I use them for reminding me of things, keeping track of assignments, deadlines, and also in both cases, I sent myself advance warnings." "I used the little task manager. The To Do List. Where you put it in and check off what you have done. And then I used the calendar. So, it gave me reminders and updates or whatever." And "I opted not to use the *Getting Things Done*™ software."

The third question asked about *Getting Things Done™:* How often did you use the software during the semester? Table 4.30 summarizes the responses.

Table 4.30

Opinion Data Question 3 Summary

How often was GTD Software Used	Number Mentioned	Percent Mentioned
Did Not Use during Semester	5	62.5%
Daily	2	25.0%
Used D2L instead of GTD Software	1	12.5%

Comments related to this question include: “Pretty much daily.” “I probably use iGoogle™ a little bit more because I don’t go to D2L every day, but I go to iGoogle™ every day.” And “I checked the calendar every time I go onto D2L.”

The fourth question asked about *Getting Things Done™:* Were there any issues that kept you from using the software? Table 4.31 summarizes the responses.

Table 4.31

Opinion Data Question 4 Summary

Issues	Number Mentioned	Percent Mentioned
Another Thing to Do	3	37.5%
Internet Access	2	25.0%
Duplicate Software	1	12.5%
No Issues	2	25.0%

Comments related to this question include: “I think the fact that it was just another thing that I’d had to log into. I liked being able to just click back to the calendar in D2L since I was already there for the Ed Tech class.” “It just seemed like an extra, an extra thing. You know with D2L, I’ve got to go there anyway, that’s where my class is. Whereas that other stuff, you have to go somewhere else that isn’t you know, I don’t have anything there already that is drawing me there.” “It was just another thing to go into and another place to go for another calendar that I had to look at whenever I already had my calendar in my email and I had the calendar in D2L, and so there was just going to be another link that I had to go to.” “I think because I don’t have the Internet on my phone.” “The main thing that stopped me from using those is the electronic one we have on D2L,

it's the same thing varied for the class. I use that [D2L] a lot." And "No, because I could get on it from every computer."

The fifth question asked about *Getting Things Done™:* What could be changed to allow you to use the software in the course? Table 4.32 summarizes the responses.

Table 4.32

Opinion Data Question 5 Summary

What Could be Changed	Number Mentioned	Percent Mentioned
Teacher Use to Encourage Students	2	25.0%
Make it Part of Grade/Required	2	25.0%
Phone with App	1	12.5%
Nothing	1	12.5%
Did Not Ask	2	25.0%

Comments related to this question include: "If [the instructor] put all of [their] stuff on iGoogle™, then I would have a reason that I would kind of have to go there and so it would kind of veer me that direction." "Some type of point award." And "It would have been easier if I had like a palm pilot, like a blackberry, so it would just be there."

The sixth question asked about *Getting Things Done™:* What is your opinion of iGoogle™? Table 4.33 summarizes the responses.

Table 4.33

Opinion Data Question 6 Summary

Opinion of iGoogle™	Number Mentioned	Percent Mentioned
Positive	8	100%
Negative	0	0%

Comments related to this question include: “It seemed like a neat little custom page and all that stuff.” “I think it was really neat, and it could be really useful. But you need to be somewhere you are at a computer every day.” “I thought it was pretty cool, some of the different things, like the applications.” “I think the concept is really good. I mean, it’s easy access, it’s easy to use. You can put anything on there.” And “I really like it. I like the layout. I like that you can customize it. So you can make it almost like your own homepage.”

The seventh question asked about *Getting Things Done™:* Which functions of iGoogle™ did you use? Table 4.34 summarizes the responses.

Table 4.34

Opinion Data Question 7 Summary

Functions Used	Number Mentioned	Percent Mentioned
Calendar	2	25.0%
Remember the Milk Application	1	12.5%
To-Do List	1	12.5%
Other – News, Weather, You-Tube	3	37.5%
Did Not Use Any	2	25.0%
Did Not Ask	2	25.0%

Comments related to this question include: “I have Remember the Milk, I have the To-Do Lists, I have today’s events in history, kind of things like that.” “I have the calendar, the task list, I had a You-Tube link, I had a clock.” And “The weather and some art, little things that were out there, the quotes and I could get at my stock market stuff. And have all that stuff on one page, which was nice.”

The eighth question asked about *Getting Things Done™:* Which functions of iGoogle™ were most/least beneficial? Table 4.35 summarizes the responses.

Table 4.35

Opinion Data Question 8 Summary

Most/Least Beneficial Functions	Number Mentioned	Percent Mentioned
Most: Calendar	2	25.0%
Most: Task List	1	12.5%
Most: Anywhere Access	1	12.5%
Least: Distractions	1	12.5%
Least: Unused Applications	1	12.5%
Least: Work to Keep Up to Date	1	12.5%
Did Not Ask	4	50%

Comments related to most beneficial functions include: “The calendar and the task list. Those were the ones I actually used. All the other ones were recreational, purely for fun.” “Upcoming events, so that I could keep track of everything coming up.” And “That you can access it from anywhere you can get to the Internet so if you forget your stuff or you are at a friend’s house, you could just log in and see whatever you needed to do.” Comments related to least beneficial functions include: “The distractions, the overall number of things I could look at.” “Probably the news, because I am pretty sure I never looked at it, it just looked cool.” And “Probably that you have to fill it out and you could make errors or things can change and if you don’t get that changed and you look at your iGoogle™, it is not going to be up to date and it just another thing you have to sign into, so some people would probably rather have a mortarboard that they can hold with them, than be dependent on having access to the Internet.”

The ninth question asked about *Getting Things Done™:* How did you organize your time and study environment for this course? Table 4.36 summarizes the responses.

Table 4.36

Opinion Data Question 9 Summary

Time and Study Environment Organization	Number Mentioned	Percent Mentioned
To Do Lists	3	37.5%
Around Available Time Slots	3	37.5%
Around Deadlines	2	25.0%
Daily Study Time	1	12.5%
Break Projects into Steps	1	12.5%
Library with Music	1	12.5%
Calendar	1	12.5%
Did Not Organize – Rushed to Finish Projects	1	12.5%

Comments related to this question include: “Based on what’s coming up and if I had another major thing in another class I would spend time on that but pretty much after class every day.” “Each week we would have certain stuff due, so I tried to slowly work on it during the week whenever I had time.” “Well, I work from 7:00-2:00, I pick my son up from school at 2:00 and I get my time with him and then at 7:30 at night, I get to do school until about 10:30 or 11:00. And then I get up and do it all over again.” “For organization, the main thing is, if you have a project that is going to take more than just sitting there and doing it, it’s planning out when each step is going to be done around the rest of your schedule.” “What I would do is just start off and go to the library so I wouldn’t have any distractions, listen to music and tune out.” And “Oh, it was horrible, in

the beginning, I didn't leave enough time to do the stuff at all. I ended up crunching until the very end and turning it in at 11:59."

The tenth question asked about *Getting Things Done™:* In what ways did your study and time management change as a result of using the Task Lists and To Do Lists in iGoogle™? Table 4.37 summarizes the responses.

Table 4.37

Opinion Data Question 10 Summary

Time and Study Environment Changes	Number Mentioned	Percent Mentioned
Used the Calendar to Organize	3	37.5%
Less Cramming	2	25.0%
Did Not Ask	3	37.5%

Comments related to this question include: "I used the calendar a lot too, so you know when stuff is coming up, it's already filled out. I use that every day probably." "It was nice to have that calendar up so I knew when things are due." "It [calendar] helped me a lot because it is just like visual reminders on one place." "It wasn't as much the actual calendar but the deadlines on the calendar." And "I think there was less cramming. I think there was more space in between when a project was started and when it was finished."

The eleventh question asked about *Getting Things Done™:* In what ways did the software increase your motivation towards completing course goals? Table 4.38 summarizes the responses.

Table 4.38

Opinion Data Question 11 Summary

How did Software increase Motivation	Number Mentioned	Percent Mentioned
Confidence	1	12.5%
Not Overwhelmed	2	25.0%
Organization	2	25.0%
Kept on Track	1	12.5%
Did Not Miss Deadlines	1	12.5%
Could See Progress	1	12.5%
Did Not Increase Motivation	1	12.5%
Did Not Ask	2	25.0%

Comments related to this question include: “I felt more confident in myself to do all the projects.” “Since I had it organized, I didn’t get overwhelmed as much.” It helped me not get too overwhelmed. I didn’t get the feeling at the end of the semester that ‘there’s no way I can pass this class because I am so far behind’ because it was able to keep me organized.” “It helped keep me on track.” It would make you happy that you caught something before it was too late.” And “I don’t know if it increased my motivation, I think the grades section increased my motivation.”

The twelfth question asked about *Getting Things Done™:* How did the software help you in this course? And How did the software hinder you in this course? Tables 3.39 and 3.40 summarize the responses.

Table 4.39

Opinion Data Question 12a Summary

How did the Software Help	Number Mentioned	Percent Mentioned
Due Dates	2	25.0%
Stay on Task	1	12.5%
Prioritize	1	12.5%
Planning	1	12.5%
Maintain focus and organization	1	12.5%
Time Management	1	12.5%

Comments related to this question include: “It kept me in line to get things done on time.” ”I used it to organize my tasks, set reminders, and used online sticky notes.” “I think it maintained my focus and organizational processes.” “It helped to look forward to see and to plan my week. I know if another big assignment in a different class is due that same day, then I will try to do one the day before and one the day of, to try to space it out a little bit so that I am not panicking the last day that it is due.” “It helped me stay on task as far as prioritizing. It just helped me to prioritize my time.” “It helped me seeing due dates on things. Knowing when something’s due down to the time and knowing just ahead of time that this is due next week and be ready for it.” And “It just helped me with my time management.”

Table 4.40

Opinion Data Question 12b Summary

How did the Software Hinder	Number Mentioned	Percent Mentioned
No Hindrance	4	50.0%
Mismanage Time	1	12.5%
Distractions	2	25.0%
Forgot to Add Tasks	1	12.5%

Comments related to this question include: “I don’t really see that it was a hindrance.” “I don’t know that it did other than when I forgot to put stuff on there.” “Probably not unless I spent too much time on there on other widgets.” “Other than the mild distractions of having too much on iGoogle™, I don’t think that it truly hindered me once I deleted the games off of there and I didn’t let myself get distracted.” And “I don’t know that it really did other than when I forgot to put stuff on there.”

The thirteenth question asked about *Getting Things Done™:* How could you use this software/calendar in other courses? Table 4.41 summarizes the responses.

Table 4.41

Opinion Data Question 13 Summary

Use in Other Courses	Number Mentioned	Percent Mentioned
To See the Big Picture	6	75.0%
For Preparation	1	12.5%
For Time Management	1	12.5%
Did Not Ask	1	12.5%

Comments related to this question include: “You log in and it’s on the side [of the screen] and you’ll see I’ve got a speech coming up in my class Thursday night or my professor in my methods class changed something.” “In the sense of strategy planning with my papers and plotting out what I was supposed to do and when so that I could. Giving me more of a rhythm to the semester instead of just being hectic and reacting to the semester.” “All my due dates are on there. And the good thing about it, if I didn’t have my planner on me, I could check it online on my phone too.” “If all the classes, if all the teachers, put all their assignments and when they’re due and all of that stuff on D2L, that would be awesome. Because you could just see it and you could see how that correlates with the other classes.” And “It helps you with your time management and better organization.”

The fourteenth question asked about *Getting Things Done™:* Would you recommend the software to others? Why or why not? Tables 3.42 and 3.43 summarize the responses.

Table 4.42

Opinion Data Question 14a Summary

Would You Recommend the Software	Number Mentioned	Percent Mentioned
Yes	8	100%

All students would recommend the software to other students.

Table 4.43

Opinion Data Question 14b Summary

Why or Why Not	Number Mentioned	Percent Mentioned
Helps with Access	2	25.0%
Helps with Planning and Organization	1	12.5%
Usefulness	2	25.0%
Helps those who are Disorganized	1	12.5%
Helps with Due Dates and Communication	1	12.5%
Hinders because Time Consuming	1	12.5%

Comments related to this question include: “It is great because you can bring it up anywhere.” “It’s handy just to have something right there in what you are already working in.” “It really helps to keep up to date with what’s coming up, what’s going on so that you don’t have anything sneak up on you.” “If I knew somebody who was really disorganized.” “Anything we can do to better organize ourselves, so we are not cramming things at the last second.” And “I think it is a good program if you are willing to use it. If you have the time to use it and you know you are going to go in and get it set up how you want it and get all your stuff put in there. I think maintaining it was a big thing.”

The fifteenth question asked about *Getting Things Done™:* Do you have any other comments? Table 4.44 summarizes the responses.

Table 4.44

Opinion Data Question 15 Summary

Any Additional Comments	Number Mentioned	Percent Mentioned
No Further Comments	7	87.5%
Useful Tools but Not For Me	1	12.5%

Comments related to this question include: “It was good, useful tools but my life didn’t really facilitate using them.”

D2L platform data.

Additional questions were asked of the interviewees related to D2L, the online course platform, due to overwhelming comments made by students that the functions in the D2L platform were utilized more than the study software. Questions were asked about opinions, most and least beneficial functions, and how the calendar was utilized. Their responses are summarized below.

The first question asked about the D2L platform: What is your opinion of the D2L platform? Table 4.45 summarizes the responses.

Table 4.45

D2L Platform Question 1 Summary

Opinion of the D2L Platform	Number Mentioned	Percent Mentioned
Good because already in D2L for class	4	50.0%
Good for Teacher/Student Interface	5	62.5%
Good for Deadlines and Reminders	5	62.5%

Comments related to this question include: “It is instant communication between the teacher and student for me.” “It just helped me keep everything, all the classes, together in one place.” “I liked being able to just click back on the calendar in D2L since I was already there for the Ed Tech class.” “It’s nice because the teacher can put in things and then you can modify, not only what they’ve put in with notes of your own, but you can also add things on the same day or different days.” “With D2L, I’ve got to go there anyway, that’s where my class is.” And “I like the fact that the instructor can put things on there. It just helped me keep everything, all the classes together in one place.”

The second question asked about the D2L calendar: How was the calendar in D2L utilized? Table 4.46 summarizes the responses.

Table 4.46

D2L Platform Question 2 Summary

D2L Calendar Utilization	Number Mentioned	Percent Mentioned
Deadlines/Due Dates	5	62.5%
Organization	2	25.0%
Reminders	2	25.0%
Priorities	1	12.5%

Comments related to this question include: “As soon as the teacher fixes something, I can look on D2L immediately and know that a date has been changed, I don’t have to have that done today, thank God.” “The teacher put deadlines out there.” “I love calendars where I can see the days and the due dates that they are on.” “And then when I go into D2L, there’s a reminder again, just as a secondary backup.” “Just really the organization of using the calendar and allocating what and when I needed to do

things. Not necessarily as a reminder, but specifically putting on the calendar 'start on this date' so I can organize my thoughts a little and plan ahead." "Mainly for just assignments and specific things related to class, deadlines, reminders, things like that. And strategy to the sense of planning ahead on things organizationally." "I can set priorities on it and stuff like that." "Basically just to organize. Just to put in the dates when things were due." And "It wasn't as much the actual calendar but the deadlines on the calendar."

The third question asked about the D2L calendar: What were the most beneficial functions of the D2L platform? Table 4.47 summarizes the responses.

Table 4.47

D2L Platform Question 3 Summary

Most Beneficial Functions	Number Mentioned	Percent Mentioned
Due Dates	4	50.0%
Visual Planning	2	25.0%
Course Information Online	2	25.0%
Reminders	1	12.5%

Comments related to this question include: "The connection that the teachers could put things into it as well as I did. I didn't have to go back in and double-check my syllabus on everything. A lot of it was already in there." "The reminder, the fact that it will let you set reminders by certain numbers of dates, so that you can, literally not have it flash up there on the due date, but you can set it in advance." "Pretty near anytime I got on D2L, I'd look at the events calendar, so that I could see if anything had changed. See if anything new had been added to that I could keep my stuff up to date." "I absolutely

loved that the teacher used the calendar, that was such an awesome tool and I wish all my teachers did." "Being able to access information within the D2L system. Whichever class I was in I was able to go back to my home and plug things in." "The due dates, having it all visually available. This week I have this much to do. I've got that much to do and I can just transfer it over to my planner and match it up with my other classes." "It was right there in my space, I was already looking at all the content stuff in the class. I would just go to the calendar for the class and it was right there and everything was out there and deadlines were there." "It was easy for me to quickly check things while I was at work on a break or in between tasks. I was able to pull it up and leave it up." And "It was nice to have that calendar up so I know when things are due."

The last question asked about the D2L platform: What were the least beneficial functions of the D2L platform? Table 4.48 summarizes the responses.

Table 4.48

D2L Platform Question 4 Summary

Least Beneficial Functions	Number Mentioned	Percent Mentioned
Time to learn how to use D2L	2	25.0%
Miss assignments not on D2L	1	12.5%
Unused class functions	1	12.5%

Comments related to this question include: "It could be a little bit more user friendly. But otherwise, once you get the hang of it, it's nice." "Not very user friendly. It takes a little bit to figure out." "If I forgot to put something out there or sometimes the discussion boards wouldn't be on the calendar but they would be in the discussion board section, but I would sometimes check only the calendar and not the other places so that

was kind of bad. I think I missed a quiz, I missed two quizzes cause I didn't get it put on the calendar and it was on the quiz part, so I completely forgot." And "There were some things that I didn't find that were relevant but someone else might."

Conclusion

The following chapter will discuss findings, conclusions and future recommendations. This will include a discussion of the quantitative and qualitative findings, conclusions that can be drawn from the findings and recommendations for future areas of research.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Chapter 5 completes the dissertation. A summary of the purpose and design of the study precedes a discussion of the results as they relate to the research question. Conclusions are made and limitations are noted. Based on the results of the study, implications are drawn from the conclusions and recommendations for future research are then presented. Finally, the researcher brings this phase of the study to a close.

Summary of the Study

This study sought to investigate the effect of *Getting Things Done*™ (GTD) software on the motivation and self-regulation of pre-service teachers enrolled in an introductory Educational Technology course. The following research question was addressed: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation?

A pre-test/post-test design was used to collect data from the two comparison groups. Comparison groups consisted of a control group and an experimental group of pre-service teachers enrolled in different sections of an Educational Technology course required for pre-service teachers. Subjects first completed the Motivated Strategies Learning Questionnaire (MSLQ). Additionally, a Likert-Type Scale survey with open-

ended, short answer/essay questions was administered to all participants so they could self-assess their skill level, their comfort with technology, and their classroom experiences. These surveys were administered at both the beginning and end of the research cycle. To enhance the results gathered through the surveys, qualitative data was collected through semi-structured interviews conducted with eight randomly selected students participating in the experimental groups. Two students from each of the experimental groups (classes) were interviewed. No students from the control groups were interviewed because the researcher discovered that the majority of the interview questions focused only on the GTD software utilized during the study instead of the concepts the software reinforced.

Paired sample t-tests were used to investigate pre- and post-test means between the variables and independent samples t-tests were conducted to look at the difference in means between the control groups and the experimental groups. Pearson bivariate correlations were performed for pre- and post-test variables in the control and experimental groups. For consistency in this study, the researcher and the researcher's co-chair chose the following levels for interpreting r^2 in the Pearson bivariate correlations: low 10%, moderate 15% - 40%, and high 50% and higher. Open-ended questions and interview results were transcribed and analyzed for common themes.

General Discussion

In this section the results are discussed in terms of their relationship to the research question: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation? Based on the researcher's experience teaching the course, using

organizational software, and presenting the instructional requirements for the course, she anticipated there would be a significant difference between the pre-test and post-test results of the experimental groups and the control groups.

MSLQ results.

Paired sample t-tests conducted on the data from the experimental groups found significant differences in the pre- and post-test means for five of the seven MSLQ pairs utilized in the study. Within the Motivation Scales, only the subscale, Control of Learning Beliefs was significant at the 95% confidence level, $t(44) = 2.210$, $p < .05$. Within the Learning Strategies Scale, data collected on all four subscales was significantly different. Data gathered from the Organization Scale was significant at the 95% confidence level, $t(44) = 3.596$, $p < .05$. Metacognitive Self-Regulation data results were significant at the 95% confidence level, $t(44) = 2.415$, $p < .05$. Time and Study Environment data was significant at the 95% confidence level, $t(44) = 3.301$, $p < .05$. Effort Regulation data was significant at the 95% confidence level, $t(44) = 2.151$, $p < .05$. The results suggest that utilizing *Getting Things Done*™ software does increase Motivation and Self-Regulation in pre-service teachers.

However, within the control group, three of the seven MSLQ pairs were statistically significant. None of the Motivation Scales demonstrated statistical significance. Three of the Learning Strategies subscales were significant. Organization was significant at the 95% confidence level, $t(44) = 2.101$, $p < .05$. Metacognitive Self-Regulation was significant at the 95% confidence level, $t(44) = 2.411$, $p < .05$. And, Time and Study Environment was significant at the 95% confidence level,

$t(44) = 4.623$, $p < .05$. Significant results in both the experimental and control groups suggest that something other than the experimental factors were affecting results.

Along with paired sample t-tests, Pearson bivariate correlations were conducted between all of the subscales for the experimental groups. Of the twenty-one pairs, seventeen were statistically significant at the 95% confidence level. Of the statistically significant pairs, nine displayed moderate levels of correlation. Table 5.1 details the findings.

Table 5.1

Pearson Bivariate Correlations Experimental Groups Post-Test Variables

	Pearson Correlation *r*	Coefficient of Determination r^2	Sig. (2-tailed)
Control Learning Beliefs and Metacognitive Self-Regulation	0.484	0.234	0.001*
Control Learning Beliefs and Organization	0.459	0.211	0.002*
Control Learning Beliefs and Self-Efficacy	0.437	0.191	0.003*
Control Learning Beliefs and Task Value	0.521	0.271	0.000*
Effort Regulation and Self-Efficacy	0.530	0.281	0.000*
Effort Regulation and Time and Study Environment	0.561	0.315	0.000*
Metacognitive Self-Regulation and Organization	0.721	0.520	0.000*
Self-Efficacy and Task Value	0.484	0.234	0.001*

*p < .05 statistically significant

Pearson bivariate correlations were also conducted between all of the subscales of the control groups. Of the twenty-one pairs, eleven were statistically significant at the 95% confidence level. Of the statistically significant pairs, nine displayed moderate levels of correlation. Table 5.2 details the findings.

Table 5.2

Pearson Bivariate Correlations Control Groups Post-Test Variables

	Pearson Correlation *r*	Coefficient of Determination r^2	Sig. (2-tailed)
Control Learning Beliefs and Effort Regulation	0.497	0.247	0.001*
Control Learning Beliefs and Self-Efficacy	0.571	0.326	0.000*
Control Learning Beliefs and Task Value	0.479	0.229	0.001*
Effort Regulation and Metacognitive Self-Regulation	0.526	0.277	0.000*
Effort Regulation and Self-Efficacy	0.587	0.345	0.000*
Effort Regulation and Time and Study Environment	0.611	0.373	0.000*
Metacognitive Self-Regulation and Organization	0.531	0.282	0.000*
Metacognitive Self-Regulation and Time and Study Environment	0.546	0.298	0.000*
Self-Efficacy and Task Value	0.505	0.255	0.000*

*$p < .05$ statistically significant

Comparing the Pearson bivariate correlations for the experimental and the control groups reveals that both groups had nine pairs with moderate levels of correlation. Of

those nine pairs, seven were the same for both: Control of Learning Beliefs and Self-Efficacy, Control of Learning Beliefs and Task Value, Effort Regulation and Metacognitive Self-Regulation, Effort Regulation and Self-Efficacy, Effort Regulation and Time and Study Environment, Metacognitive Self-Regulation and Organization, and Self-Efficacy and Task Value. While the correlation results are consistent with the literature (Sungur & Tekkaya, 2006; Crede & Phillips, 2011; Clark, 2006; and Pintrich et al., 1991), the overlapping similarities suggest that something other than the GTD treatment was affecting the correlations; therefore, the correlations do not confirm that GTD alone increased the motivation and self-regulation of pre-service teachers in this study.

Independent samples t-tests were also conducted to determine whether differences between the post-test means of the experimental groups and the control groups for each of the seven subscales existed. No statically significant differences were found in any of the subscales. See Table 4.8 for specific details. Based on these results, the researcher concluded that the experimental groups did not show a statistically significant increase in motivation and self-regulation when compared to the control groups. These results do not support an affirmative answer to the research question: Do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation when compared to students who do not use the organizational software?

In addition to the independent samples t-tests, Pearson bivariate correlations were also conducted between the post-test experimental groups and control groups variables to ascertain strength of relationships. Of the forty-nine calculations, only two were

statistically significant. The first, Metacognitive Self-Regulation control groups and Self-Efficacy experimental groups, demonstrated a low negative correlation, $r(43) = -.384$, $p < .01$ between the two scales. This indicates that only 14.7% of the variance between the variables was shared, $r^2 = .147$. The negative correlation indicated that as Self-Efficacy increased, Metacognitive Self-Regulation decreased. The second, Time and Study Environment control groups and Organization experimental groups, also demonstrated a low positive correlation between the two scales, $r(43) = .338$, $p < .05$. This indicates that only 11.4% of the variance between the variables was shared, $r^2 = .114$. These low positive correlations indicate a weak relationship exists between the two sets of variables. However, Pyrczak (2006) indicates caution should be used when interpreting small values of r^2 since large percentages of the variance cannot be accounted for between the variables. In general, it seems as though there may be a possible causal relationship between the variables, but other effects should be considered.

Likert-type scale results.

Paired sample t-tests conducted with the experimental groups found significant differences in the pre- and post-test means for three of the five Likert-Type Scale pairs utilized in the study. All three were significant at the 95% confidence level: Comfort, $t(44) = 4.105$, $p < .05$; Motivation, $t(44) = -3.177$, $p < .05$; and Proficiency, $t(44) = 3.728$, $p < .05$. Alternatively, the mean scores from four of the five control groups' Likert-Type Scale pairs demonstrated statistical significance in the pre- and post-test data. All results were significant at the 95% confidence level: Ability, $t(44) = 4.2.485$, $p < .05$; Comfort, $t(44) = 3.964$, $p < .05$; Motivation, $t(44) = -3.246$, $p < .05$; and Proficiency, $t(44) = 4.057$, $p < .05$. As mentioned previously, regarding the

MSLQ results, significant results between the experimental groups and the control groups suggest that some influence other than the experimental factors were affecting the results.

Along with paired sample t-tests, Pearson bivariate correlations were conducted between all of the subscale data collected from the experimental groups. Of the ten pairs, four were statistically significant at the 95% confidence level. Of the statistically significant pairs, two displayed moderate levels of correlation. These include: Ability and Proficiency (r = 0.509 and r^2 = .259), and Motivation and Organization (r = 0.603 and r^2 = .364).

Pearson bivariate correlations were also conducted between all of the subscales for the control groups. All ten pairs were statistically significant at the 95% confidence level. Of the statistically significant pairs, five displayed moderate to high levels of correlation. These include: Ability and Motivation (r = 0.440 and r^2 = .194); Ability and Organization (r = 0.511 and r^2 = .261); Ability and Proficiency (r = 0.399 and r^2 = .159); Comfort and Proficiency (r = 0.848 and r^2 = .719); and Motivation and Organization (r = 0.685 and r^2 = .469).

Comparing the Pearson bivariate correlations for the experimental groups and the control groups reveals that the experimental groups had four statistically significant pairs of subscales while all of the control groups' pairings were statistically significant. While the statistical significance of the correlations presents strong evidence that the variables are related to each other, caution is advised in the interpretation of these results due to the fact that the control groups displayed more statistically significant correlations and higher levels of correlation. Research from Ary, Jacobs, and Razavieh (2002) and Pyrczak (2006) warn against the assumption of a causal relationship or practical significance

between variables based only on one set of results. Further research is warranted to determine the origin behind the relationships and no assumptions can be made on the relationships found in these correlations. One relationship that decidedly deserves further review is the construct of Ability. This construct appears to be a connecting factor in the results of both the experimental groups and the control groups. For this study, the researcher defined Ability as a personal self-assessment of organizational skills as related to the ability to complete required coursework. Future research could explore the connections this construct has with other variables.

Independent samples t-tests were also conducted to determine whether differences between the post-test means of the experimental groups and the control groups for each of the five subscales existed. No statically significant differences were found in any of the subscales. Table 4.17 details the statistics. In addition to the independent samples t-tests, Pearson bivariate correlations were also conducted between the variables of the post-test experimental groups and control groups to ascertain the strength of relationships. None of the twenty-five calculations demonstrated statistical significance (see Table 4.18). These results lead to the conclusion that the experimental groups did not show a statistically significant increase in motivation and self-regulation when compared to the motivation and self-regulation of the control groups. These results do not support a positive answer to the research question, do pre-service teachers in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation?

Open-ended question results.

A pre-test question was asked of all participants: How do you plan to organize your time and study environment for this course? Utilizing a calendar, planner, or scheduler was the most common response (32%) from the experimental groups, followed by free time (25%) and time blocks (16%). Comparatively, the control groups noted due dates (24%), no plans (20%), and time blocks (18%). Zimmerman, Bonner, and Kovach (2008) offer the opinion that the effective use of study time becomes imperative to academic success, and those who do not effectively use their study time are forced into expediency, which is the exact opposite of self-regulated learning.

A post-test question was also asked of all participants: Was there anything you learned or experienced in this course that helped you to organize your time and study environment for this class? The experimental groups responded overwhelming that technology applications assisted them with their time and study environment. The responses included online calendar (28%), iGoogle™ (17%), Microsoft Office (17%), D2L, the online course platform (11%), and Remember the Milk (6%). Hofer, Yu and Pintrich (1998) note that inserting strategy instruction into course materials shows students the usefulness of using a self-regulatory approach. The authors say that this increases the possibility that students will continue to utilize the skill rather than see it as a course specific method. Alternatively, almost half of the control groups (48.8%) offered no response to this question. Of those who did answer, only two dedicated technology components were mentioned, Microsoft Office (13%) and D2L (8%).

The results of these questions indicate that students in the experimental groups were more likely to utilize technology tools to assist them with organizing their time and

study environment than those in the control groups. This also suggests that students in the experimental groups were more likely to utilize self-regulation tools to complete course assignments. In a study of college students' self-regulation and motivation, Wolters (1998) found that self-regulated learners successfully adapt or modify learning strategies to fit situational requirements. This leads to the conclusion that students in the experimental groups began utilizing the self-regulation tools provided to them during the study to help them complete course assignments in a timely fashion.

Interview results.

The majority of students interviewed considered themselves to be average or above average in their computer skills (87.5%). Most students had previously worked with computers, so they were confident in their ability to use the computer in this class. This could be attributed to the fact that computers and computer assignments are a staple in most college classrooms. Technology assistance came in the form of tips, tools and education-specific skills on the computer. Students' confidence decreased during the semester when they were presented with new technologies and a heavy course workload. However, by the end of the semester, students felt as if their confidence levels had increased and they had more tools to utilize in their future classrooms as teachers. This rise in confidence is discussed in Bandura's (1993) work on self-efficacy. Bandura points out that self-efficacy, which is the belief that one can accomplish a given goal, is the most powerful contributing factor in one's personal belief about the ability to exercise control over his or her level of functioning. The students interviewed during this study offered the opinion that they felt they could utilize the newly learned technology in their future classrooms based on the positive personal experiences they encountered with the

software over the course of the semester. The implication for this finding asserts that students developed higher levels of self-efficacy towards Educational Technology tools through their proficiency with the software.

Several students mentioned they were not motivated to complete this required course (37.5%); however, their motivation increased during the semester as they began to realize how useful the tools were and discussed ways technology could be implemented successfully in their future classrooms. That excitement motivated them to consider the usefulness of integrating technology into their future classroom instruction. Pintrich (2003) offers the opinion that students are motivated to do well when they have a high interest in the subject. The possibility exists that students in this course showed increased motivation because they were provided with course tools and assignments that, as Pintrich suggests, are interesting, meaningful, and varied.

Most students desired to be organized in completing course assignments and tasks, yet interestingly only one student utilized the GTD technology consistently during the semester. Most of the students utilized the tools offered on the university online learning platform, D2L, instead. The utilization of the D2L platform tools instead of the GTD technology seems to be a function of the course design and instructional requirements. Since the course instructors utilized the D2L platform for course components, due dates, rubrics, assignment descriptions, reminders, and links for support materials, students were not required to invest the personal effort and time to organize course materials for themselves. Wolters, Pintrich, and Karabenick (2003) assert that self-regulated learning is an active, constructive process. In the process, learning goals are set, monitored, and regulated personally by the student. The environment gives

context and constraints to the goals. In this study, the environment was not conducive to self-regulated learning since the students were not required to play an active role in the organization of course materials.

When asked how the GTD training assisted with course material completion, most students were of the opinion that the GTD software helped them with organization (50%), focus (37.5%) and use of new programs (75.0%). Allen (2001) believes that organization occurs when components, sequences and priorities have been identified. As one interviewed student commented, "You really do have to be organized for this class or you will forget stuff." Surprisingly, only one of the students interviewed had utilized the GTD software over the duration of the course during the semester. However, the student who utilized the software did so on a daily basis. The lack of utilization by the remaining students may be explained by their consistent use of the course resources in the D2L system. As indicated in the interviews, specific reasons for not utilizing the GTD software included the opinion that it was "another thing to log into" or "an extra thing to do." These students recognized that the GTD software provided an innovative way to organize course workload, due dates and assignments; however, as Maloney (2007) points out, course management systems are typically only utilized to provide students with access to course materials and grades. Introducing an ungraded, novel system to organize and manage course material may have moved students out of their comfort zone of traditional online course material delivery since utilizing the GTD software required the students to go to a new website, create a new account and take personal responsibility for entering to-do items.

During pre-test data collection, students were trained to use iGoogle™ and Remember the Milk (a web-based, task management program). Based on that training, students reported creating iGoogle™ accounts with calendar functions (25%), to-do lists (12.5%), and news applications (37.5%). They offered the opinion that the most beneficial functions were the calendar (25%), the task list (12.5%), and anywhere access (12.5%). All interviewed students responded favorably to the GTD programs of iGoogle™ and Remember the Milk; however, 50% of the students did not offer opinions on the most beneficial functions because they did not utilize the program. These results correspond to Kumar and Vigil's (2011) comparison of pre-service teachers' informal and formal use of technologies. They found that informal or personal use of technologies was higher than students' formal or classroom use of technologies.

When asked how time and study environments were organized for this course, the most common responses from the students were to create to-do lists (37.5%) and work around available time slots (37.5%). From further probing, it was determined that many students used online calendars to stay current with class requirements (37.5%). Online calendars also provided several students (25%) with the opportunity to complete coursework with less last minute cramming. These findings indicate the use of self-regulated learning strategies as put forth by Wolters (2003a). Wolters discusses the belief that self-regulated learners possess higher levels of awareness about different learning tactics and they have the capacity to choose and regulate their use of those approaches when engaged in academic responsibilities.

Inquiring about motivation towards course goals as related to GTD software revealed that students felt more confident (12.5%), stayed on track (12.5%), felt less

overwhelmed (25%), were more organized (25%), missed fewer deadlines (12.5%), and could see personal progress (12.5%). Linnebrink and Pintrich (2002) offer the opinion that instructional efforts and classroom design can make a difference in motivating students towards academic achievement. Furthermore, students reported that the calendar software assisted them with being aware of due dates (25%), staying on task (12.5%), prioritizing (12.5%), planning (12.5%), maintaining focus (12.5%), and managing their time (12.5%). Accordingly, interviewed students demonstrated that they are more motivated and self-regulated to achieve course goals in a timely manner than simply completing course assignments at the last minute.

Interviewees discussed methods in which calendaring software could be used in other courses. The vast majority (75%) of interviewees said that the calendaring software allowed them to see the "big picture" for their coursework and all said they would recommend calendaring software to other students for help with accessing course requirements (25%), planning and organization (12.5%), and meeting due dates (12.5%). When describing how D2L was used for this course, students responded for deadlines and due dates (62.5%), organization, (25%), reminders (25%), and priorities (12.5%). The most beneficial features of D2L were due dates (50%), visual planning (25%), online course information (25%), and reminders (12.5%). Revere and Kovach (2011) discussed how course platform options enhance learning and note that when utilized appropriately, technological options promote student engagement in the learning process.

Research Study Conclusions

To summarize the components and ideas reflected in this study, Self-Regulated Learning was defined as "Self-directive processes and self-beliefs that enable learners to

transform their mental abilities…into an academic performance skill" (Zimmerman, 2008, p. 166). Motivation is the sense of energy or activation students demonstrated in completing the course assignments (Ryan & Deci, 2000b). Pre-service teachers refers to the students enrolled in teacher education programs at degree granting institutions of higher education. The MSLQ is "a self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies for a college course" particularly as it relates to the timely completion of course assignments (Pintrich et al., 1993, p. 801). Educational Technology was defined as "The study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (Richey, 2008, p. 24). The EDTC 3123 class was an undergraduate level course required for pre-service teachers at a Midwestern university, focused on planning, developing, and implementing educational media and technology into classroom instruction. The course also introduces guidelines for materials development, contemporary applications of computers and other electronic systems for instruction as well as integration of instructional design, instructional media, and instructional computing for use personally and in the classroom (OSU Course Catalogue, 2012-2013). Taking the pieces of the puzzle and putting them together in light of the research question: Do pre-service teachers enrolled in an introductory Educational Technology course using *Getting Things Done*™ software demonstrate an increase in motivation and self-regulation, the following discussion is offered.

Given the significant results in both the experimental groups and the control groups for the MSLQ subscales and the Likert-type data, alternative causes for significance were considered. The researcher is of the opinion that the number of

significant results in both groups point to unexpected consequences via an unintentional cause. The researcher purports there were statistically significant changes in both the experimental groups and the control groups because course instructors for every section modeled the components of GTD via their use of D2L, the university online course platform, for calendaring, reminders, and course materials, which closely mimics the components of the GTD software for all of the classes. The use of D2L by all instructors as a forum for assignment updates, course scheduling, and as an organizational tool has been part of the standard class format for several years. These instructional strategies have been employed because of the high student enrollment, the high number of instructors teaching multiple sections every semester, and a standardized, but heavy, workload for the students. Unfortunately, the standardized utilization of the D2L platform by instructors in both the experimental groups and control groups was not considered when the study was designed; consequently, there was little room for making changes in the format of the course or among the instructors teaching the experimental groups and control groups.

Therefore, due to course structure, all students were provided with information and tools to stay connected to and on top of course material via the online course platform and were not forced to seek out alternative methods to stay organized. The impact of the experimental intervention had little to do with the statistical outcomes because all courses are taught the same way. For the experimental groups, iGoogle™ and/or Remember the Milk would have provided them with the tools to current with the course assignments, but these additional tools were not needed. As Zimmerman (1998a, p.1) points out "Self-regulated learners, whether historic or contemporary, are

distinguished by their view of academic learning as something they do for themselves rather than as something that is done for them or to them." The instructors did not compel the students in the experimental groups to do it for themselves. Ironically, Zimmerman points out later in the chapter, self-regulated learning is impacted by social influences such as modeling and social structuring.

One important component of the EDTC 3123 course is the high number of assignments due throughout the semester, approximately 1 or 2 every week. There are multiple assignments, projects, quizzes, presentations and group activities. Students in the class who can juggle the multiple demands of the course and their other courses do well. Students who struggle to keep up with the assignment due dates, and seemingly finding it too much to do, typically do not do well in the course because they lack the organizational skills. The MSLQ descriptive statistics highlight this struggle to keep up with course demands. It was found that the post-test means decreased from the pre-test means for all seven of the subscales in the experimental groups and for five of the seven subscales in the control groups (see Tables 4.2 and 4.4). Zimmerman, Bonner, and Kovach (2008) offer the opinion that the effective use of study time becomes imperative to academic success and those students who do not effectively use their study and prep time are forced into expediency, the exact opposite of self-regulated learning.

Although the Pearson bivariate correlation results revealed several large correlations between the study variables, the researcher acknowledges that while parts of the data are significant, not all of the results may be meaningful. Perhaps the data from the correlations must be looked at as only one part of the whole picture presented in the study. When taking all of the statistics into consideration, there are questions about the

reliability of the data and the concern that the data is confounded by the instructor influences mentioned previously. For example, Effort Regulation and Time and Study Environment demonstrated moderately high levels of correlation in both the experimental groups (r^2 = .315) and the control groups (r^2 = .373). This indicates there is a definite relationship between these variables, but since it was seen in both groups, the cause of the high correlation is suspect and cannot be attributed to the experimental groups' intervention. Additionally, the high Pearson bivariate correlation results from the MSLQ pairs may have resulted from the utilization of the same subjects for the pre- and post-test data collection. Since these are the exact same students, the results should be highly correlated. Nonetheless, some of the correlations merit further discussion and all deserve another review in a new study that controls for instructor influences.

One correlation result that should be reviewed is the relationship between Control of Learning Beliefs and Metacognitive Self-Regulation. This relationship is key for students who desire to succeed in the classroom. According to Pintrich et al. (1991), Control of Learning Beliefs refers to students who believe that personal efforts can positively affect academic performance. Metacognitive Self-Regulation is defined as being aware of, having knowledge of, and controlling personal cognition. For this study, 23.4% of the variance between the experimental groups' Control of Learning Beliefs and Metacognitive Self-Regulation is in common, indicating a moderate positive relationship between the two variables. These results are consistent with results Sungur and Tekkaya (2006) found in their research on motivation and self-regulation with 10th grade students for Control of Learning Beliefs and Metacognitive Self-Regulation (r = 0.503, p < .01).

Therefore, those who are aware of their personal cognition may also believe they can positively affect their academic performance.

The current study attempted to provide pre-service teachers additional tools they could utilize to be successful, not only in this class, but in their future academic work and their own classrooms once they have graduated. This study was also a starting point for future research in a variety of areas and disciplines. The statistical results were disappointing; however, once a possible root cause was discovered, there came hope that the study could be improved and conducted again. GTD was seen by the researcher as a tool to enhance learning and organize the chaos of a high intensity and heavy workload class. The researcher hoped that GTD would make the class workload and life easier for the students in the experimental groups. However, whether it was the impact of GTD or D2L, the goal was to encourage motivation and self-regulation in students. Corno (2008) says that ongoing use of self-regulation in academic settings increases the likelihood that the skills will become an automatic response.

One thing to consider is the prevalence of emerging technologies our current pre-service teachers will access in their own classrooms. Pre-service teachers must learn to utilize technology as a tool not only in their personal lives, but also in their academic and professional lives. Many of today's in-service teachers use computer technology to enter grades, communicate with parents, and send homework reminders, therefore, pre-service teachers have to learn to manage the technology themselves so they can do it when they move into their own classrooms. Dettori, Giannetti, and Persico (2006) conducted a self-regulation study with pre-service teachers in an online environment. The authors found that having an online social presence in the community of the online classroom is a key

element in self-regulation for online courses. While most of the students did not use iGoogle™ during the course of the study, the environments created in the iGoogle™ application provide the opportunity to merge school and personal lives. The course platform, D2L, does provide an online social presence since course members can access discussion boards, class members' home pages and class members' blogs.

Connecting the research to Self-Determination Theory, the theoretical approach employed in the study, Deci et al. (1994) offer the thought that Self-Determination Theory assumes that individuals are innately motivated to take on and integrate useful activities that assist them in negotiating the social environment of their lives. Self-regulated students must learn to make connections between their social presence and their academic presence. The incorporation of GTD was intended to provide that type of guidance for pre-service teachers. Unfortunately, because of the set-up of the course, those same functions were already included on the D2L platform so many of the students did not rely on the GTD software. The future goal is to blend the most effective components of GTD and D2L into a positive and supportive learning experience for pre-service teachers.

Lastly, even though the results from this study are four years old, the findings are still important and relevant because they add to the field of Educational Technology in the area of utilizing online course platforms and software to impact students' learning, motivation, and self-regulation. Even though the face of technology has changed significantly during the last four years, it is believed that students do not yet recognize the power of the technology they utilize on a daily basis. Students know how to utilize the technology for personal reasons, but it is critical that students learn how to capitalize on

the educational power that lies behind the hand held-devices. Therefore, the researcher believes that the results from this study are not obsolete because they show how small interventions can add significantly to the improvement of study skills, assignment completion, and organization strategies. These are competencies that are still critically needed in today's classroom so students understand how to make use of the power of technology to improve their lives. Additionally, the interview results illustrate the need for instruction to be student centered, especially in the area of technology. Zimmerman, Bonner, and Kovach (2008) offer the following belief, developing proficient academic learning results from developing a skill set based on systematic application of self-regulatory methods through everyday course assignments.

Limitations

Several limitations became apparent during the analyses of the study results. First, the study is involuntarily limited because of course design. All instructors inadvertently modeled GTD behavior through the standardized use of calendaring and task lists on the online class platform (D2L). This unintentionally impacted the results of the study since the instructors did the work for the students as opposed to forcing the students to do the work themselves. Different results may have been found if the students had been responsible for entering their own information into the GTD software. Additionally, different results may have been obtained in a class other than the EDTC course since the EDTC instructors did the work for the students. This can be seen as a hidden or lurking variable that did not allow the researcher to accurately gauge the power of the GTD software.

Second, the generalizability of the findings of the study are limited because the results were generated in an Educational Technology course conducted within the College of Education at a Midwestern university utilizing pre-service teachers. This study was not designed to produce results generalizable across multiple disciplines or locations.

Third, the MSLQ, a reliable and valid instrument, was employed to collect pre- and post-test data from students. Additional data was collected utilizing a Likert-Type scale developed by the researcher. The Likert-Type scale does not have proven reliability or validity, so the results generated by this instrument may not have true statistical significance.

Fourth, only students from the experimental groups were interviewed for the study because the majority of questions focused on the utilization of the GTD software rather than the concepts the software reinforced. A more comprehensive picture may have been obtained with interviews conducted with both the control and experimental groups related to the type of functions generated by GTD.

Fifth, the high Pearson bivariate correlation results from the MSLQ pairs could be seen as misrepresentative. In retrospect, these numbers were generated through the utilization of the same subjects in the pre- and post-test process; therefore, the results naturally would be highly correlated. Additionally, the higher correlations seen in the control groups may be explained by non-interference from the researcher, allowing the control groups to focus only on the organizational assistance provided by the course instructors on the D2L site.

Sixth, students who participated in the study utilized self-reporting to relay results. Self-report data may be flawed because the results rely on to student opinions, judgments, and attitudes. Lastly, due to semester time frame constraints, the study was short-term in nature. Different results may have been obtained with a longer or longitudinal study.

Implications

Implications for students.

Ease of access and instantaneous information is a hallmark of the current technological times in which we live. Oblinger and Oblinger (2005) reflect that students currently on college campuses have never known a world without computers. The authors also point out these students feel like technology is embedded into the fabric of their lives. For example, computers have become staples on college campuses, either personal, in the computer lab, or in the classroom, and students can easily find answers to questions simply by using their hand-held electronic devices. Embedding the EDTC course with instantaneous access to course assignments and information provided students with a specific tool to increase their motivation and self-regulation. Hofer, Yu, and Pintrich (1998) found that even semester long interventions on metacognition and self-regulation are helpful in developing self-regulation for college students. The authors go on to say that increasing students' knowledge base and capabilities is key in entrenching their automatic response to utilize their self-regulatory capabilities. Students should, therefore, be aware that every course they take not only builds their knowledge base for a subject or skill, but also builds their knowledge base for understanding how they personally learn best and what is needed for success. Classrooms today need to

work with students in expanding their knowledge and skills so that success is seen as more than a final letter grade in a class, and working with students means that the technology that they take for granted is an integral part of the classroom and the course structure.

ISTE (2007) developed a set of National Educational Technology Standards for Students (NETS-S). These standards put forth the belief that students should use creativity and innovation to construct knowledge; communicate and collaborate to support learning; develop research fluency to gather information; utilize critical thinking, problem solving and decision making to complete course work; understand relevant issues related to technology; and demonstrate a thorough knowledge of technology concepts and operations. The EDTC 3123 course was designed around these standards. The goal of the course was to integrate current technology with teaching practices so when these students became in-service teachers, they did not have to think twice about using the computer to develop and implement lesson plans and assignments. Yet given the heavy workload and the introduction to a plethora of new programs and devices, students often struggle to stay motivated and current with assignment due dates. A study of pre-service teachers in an Educational Technology course by Lewis and Litchfield (2011) found that that those students who believed they could achieve the course goals were more likely to receive a higher course grade. Therefore, using GTD software to assist students in achieving course goals could positively impact course grades. The researcher believes the impact of using organizational software could be much greater than just raising grades. Meeting the pre-service teachers at their hand-held technological level and providing them with course imbedded reminders and organizational tools to

complete course goals could have big picture effects. This could be a course where students learn to use technology not only to organize themselves and stay on top of the coursework in one class, but also, it could have a trickle-down effect in all their classes and their future career.

Implications for instructors.

Students in today's schools walk through the classroom door with a multitude of options available for staying connected. Smart phones, tablets, and computers instantly connect them to the world around them. Instructors who model this connectivity in their course content are demonstrating their ability to reach out to students at the students' level. If a university offers an online platform as part of the educational environment, it would be worthwhile for instructors to place course content, including due dates and reminders, on the platform for students to access at their convenience. Students who need to be reminded of a due date can access the information from their phone or tablet as opposed to waiting for the next class meeting to learn the information. Thompson (2007) contends that Web 2.0 has the potential to transform the traditional higher education model from the long-established classroom structure to an asynchronous 24/7 model. Instructors should be aware that this change is occurring and, while many continue to operate within the walls of the traditional classroom, these walls are falling down. To stay as current with technology as the students, changes must occur in course structure and coursework to meet the students at their level in their world.

Song, Hannafin, and Hill (2007) indicate that the effect of the shared teaching and learning environment should be evaluated by educators to help understand student needs and to identify teaching strategies that will help facilitate learning. Togia, Korobili, and

Malliari (2012) discovered that IT students who were motivated to learn had greater cognitive learning outcomes. The authors go on to say that educators should employ teaching strategies that drive the motivation of their students and connect course assignments with real-world applications to facilitate student self-efficacy. At the end of this experimental process, the interview results indicated that students were motivated by the real-world assignments in this course and the D2L platform met their needs for connectivity and staying current with assignments. The tools were present in the experimental groups' classrooms to increase students' motivation and self-regulation, there were confounding factors in the way of achieving the goals. While it is not possible to return to and follow up with the students who participated in the study to see if GTD had a long term effect, going forward all educators should make themselves self-aware of what they are doing within their classrooms that meet the needs of the students, model connectivity, and encourage motivation and self-regulation. This is important because the students are the reason we have the classrooms.

Implications for education.

Educators, to be effective instructional leaders, should consider how fast the world we live in changes and the importance of keeping up with students' knowledge and use of technology. Carpenter and Carpenter (2008) believe that successful implementation of instructional technology in the field of education can occur when the skills are seen as relevant to the agendas that exist in schools, lifting them from noise to employment. To ensure technology is successfully put into practice in the school, the following recommendations were offered. The process should be a teacher-involved collaborative process, the initial undertakings should be small and manageable, using a

versatile program. Finally, teachers should learn alongside students, in some cases, the students taught the teachers about the technology being implemented. Carpenter and Carpenter provide the field of education with a simple and basic roadmap to technology integration. Based on the interview and open-ended question results from this current study, students are very interested in implementing easily accessible technology tools to assist them in completing course goals. Levin and Wadmany (2006/2007) found that technology means different things to different teachers, and integrating technology into the classroom is a unique process for each educator in their longitudinal study. Overall, the authors feel that integrating technology into the classroom occurs over a continuum, moving from seeing technology as a technical tool to seeing it as an empowering partner for teachers and students. Perhaps, then, the current study can be used as a launching point of a continuum, not only for future expansion studies, but as a model for educators in what students are looking for in technology integration to assist them with self-regulation and motivation for course completion.

McCann and Turner (2004) note that a major stumbling block to learning new material, task engagement, and assignment completion is a lack of ability to maintain motivation when confronted with internal and external distractions or obstacles. The authors offer the opinion that motivation can be maintained and, hence, academic tasks completed more successfully when students utilize volitional strategies including reminders, self-rewards and organization. The GTD components of the current study provided access to several volitional strategies. For the field of education, this means that implementing volitional strategies to help students succeed is not a costly or time-

consuming process. This task can be accomplished inexpensively and with on-hand tools.

A longitudinal study following students over the course of their academic career in the College of Education could provide interesting insight. Zimmerman (2000) states that self-regulation is cyclical and that feedback from earlier performances can be utilized to make adjustments during current efforts. He goes on to say that this feedback is important because of the changes in environmental, personal and behavioral factors that occur during the course of learning. Personally, the researcher believes that the field of education should employ a similar cyclical feedback loop because changes in the environment for educators and students are ongoing and staying in tune with how to best reach students and how to best empower educators to reach the students should be a top priority. The current research is a starting point, but it is not an ending point for the topic of GTD in Educational Technology. The study has been examined for issues and problems and now exciting ideas for how to move forward are presented with the current results taken into account. Stagnancy should be eliminated as much as possible.

Implications for researchers.

There are many purposes for educational-based research. Some of these purposes include seeking to uncover new truths and discovering new ways to enhance or improve the education process for students. The current research was aimed at discovering a new method to enhance and improve student learning in an Educational Technology course. Granted, this research has generalizability limitations, but at its core, the goal was to enhance and improve students' educational experience. The research data presented in this study was collected four years before the final pages were written. In those four

years, the face of technology has decidedly evolved. There are several new tools utilized by students on a daily basis, including touch based computer tablets, multipurpose cellphones, and a variety of new programs and applications. Importantly, even though the technology has advanced, the idea behind utilizing *Getting Things Done* ™ software and online course platforms, has not changed. That idea is still very current and important since the classroom is normally slow to evolve. Going forward, researchers have to determine which online programs and applications will successfully fill the void for students in enhancing their organizational skills such as calendaring and keeping on top of multiple to-do lists and deadlines. Additionally, these students will become educators with their own classrooms and research on ways to enhance their organizational skills would be salient in the areas of classroom management and institutional administration.

Wilson (2011) states that new teachers steadily improve their effectiveness in the classroom over the first five years of teaching, but 30% of these new teachers leave the profession in that same time period. What does that mean for researchers? Research should be conducted in areas that assist in teacher retention and effectiveness. Wilson goes on to say that one key component of retaining these teachers is to focus the teacher preparation programs on foundational skills and practices. Furthermore, Shaltry et al. (2013) note that effective incorporation of technology into the classroom is a key challenge in our country today. The classroom technological components presented in this paper offer a foundational technological skill set for effective classroom management and organization for pre-service teachers. These are the same pre-service teachers who will quickly become in-service teachers seeking to improve their own classroom skills. By teaching pre-service teachers how to take care of time management and task lists

while students, they will be one step ahead in their development as more effective teachers once they graduate.

Recommendations for Future Research

The most salient area for future research lies in the area of the D2L platform. Due to the unexpected consequences of the study, future research should be conducted that accounts and controls for the online course platform. GTD research should be conducted without the instructors utilizing the course platform components to accurately account for treatment effects. Additionally, future research should include interviews with students from both the experimental and control groups to capture a comprehensive picture of the study effects. Interview questions should be designed around the concepts and skills that the GTD software reinforces. One final consideration for this future research idea is to revisit the participants after a period of time to ascertain if there are long term changes due to the GTD software and training.

Furthermore, since only one of the interviewed students consistently utilized the GTD software during the semester, while all of the students utilized the D2L platform, the researcher believes that those percentages would hold true for the entire experimental group. Therefore, research should be conducted to measure the motivation and self-regulation of students as it relates to the D2L platform as opposed to the use of external GTD products.

Future research should be considered across courses and disciplines. Completing an Educational Technology course necessitates a hands-on approach and familiarity with technology components. Different results may be found if the study was conducted in other courses or in other disciplines.

Future research could be conducted with different web-based applications and/or instruments. The GTD web applications chosen for the study, iGoogle™ and Remember the Milk, were chosen based on an informal survey of several Educational Technology sections in semesters preceding data collection. These two applications were favored among students. Perhaps future studies should utilize different applications. Additionally, the MSLQ is only one of a multitude of instruments available. Future research on D2L or motivation and self-regulation may be conducted with different instruments. Finally, given the proliferation of new hand-held technologies that have been developed in the four years since the research data was collected, future research could be conducted utilizing new technologies such as iPhones or personal notebooks.

A longitudinal study could provide a better picture of the effects of GTD. Therefore future research should look at the long-term effects of GTD and/or the D2L platform. Additionally, for colleges utilizing a cohort system for students, future research could be conducted employing multiple instructors all using the same online course platform and techniques.

GTD training may also be of assistance to freshman college students. A study might compare groups of new students who went through GTD training during new student orientation week with those who did not. Would the long-term effects of GTD make themselves known if freshman were shown a successful way to organize their education from the very beginning?

One interesting area for future research could lie in the area of combining several of these ideas. Future research could take a cohort group, instruct them early on in their coursework on the GTD method, and then follow them through their college years to

determine if the GTD has had any effect on their skills and abilities. Would the skills translate to all courses taken by the students? Since the EDTC 3123 is a required course for all education majors, the training would cut across all disciplines, providing an interesting picture of pre-service and in-service teaching at a multitude of facilities and disciplines.

Moreover, as pre-service teachers transition to in-service teachers, the reality of having their own classrooms emphasizes the overwhelming responsibility for teaching multiple classes with multiple students every day. Would training in the GTD method while in college provide them with practices to use while student teaching or in their own future classrooms? Would they be more effective teachers because of the training? Would those practices take place online or offline? A longitudinal study could provide the answer to those questions.

GTD research could also be conducted with university faculty. With regards to faculty as instructors, if they were trained in the GTD method, what would the outcome be for themselves and their classes? Would providing faculty members with the tools to effectively organize themselves and utilize the online class platform change course structure, teaching methods, or assignments? Another aspect of being a faculty member is the scholarly writing that takes place. For those tenure-track faculty members, would training on the GTD method assist them with their scholarly pursuits? Perhaps the GTD training could be part of new faculty orientation and be offered each year for new faculty and any current faculty desiring a refresher course.

Furthermore, how would GTD training affect in-service teachers? The EDTC 3123 course aims to prepare educators to comfortably utilize technology in the classroom

but there are many educators in the field who completed their coursework prior to the standardized inclusion of an Educational Technology course. Could in-service teachers benefit from the GTD method in organizing their classrooms?

Potential Research Questions

Summarizing the Recommendations for Future Research, one finds that research with pre-service teachers could be conducted utilizing a variety of alternative methods, including different instruments or software. Additionally, research could be conducted with entirely different or expanded populations in diverse settings for alternative periods of time. Based on these sentiments, potential research questions have been derived from the recommendations for future research section. One note regarding the design of a study similar to this dissertation: ensure that the experimental and control groups are as similar and equal as possible in their makeup. The similarity and equality will allow the researcher to more decisively ascertain if the treatment makes a difference since differences will be as controlled as possible. A second note for those designing a similar study, instructor training should be incorporated in research that is student focused. Included in the instructor training should be the knowledge that the students should be required to use the software or course platform included as an independent variable in the study.

- *Do pre-service teachers in an introductory Educational Technology course utilizing the online course platform demonstrate an increase in motivation and self-regulation?*
- *Do college students utilizing Getting Things Done ™ Software demonstrate an increase in motivation and self-regulation?*

- *Do pre-service teachers in an introductory Educational Technology course utilizing OmniFocus software, based on David Allen's book, Getting Things Done (2001), demonstrate an increase in motivation and self-regulation?* (*http://www.omnigroup.com/products/omnifocus*)
- *Does pre-service teacher motivation and self-regulation change during the school year as a result of utilizing Getting Things Done ™ software?*
- *In what way does student motivation and self-regulation change during college students' academic career as a result of utilizing Getting Things Done ™ software?*
- *Do university faculty trained in the Getting Things Done ™ method demonstrate an increase in motivation and self-regulation towards course instruction and/or scholarly writing?*
- *Do pre-service teachers transitioning into in-service teachers demonstrate an increase in motivation and self-regulation after utilizing Getting Things Done ™ software?*

Concluding Remarks

This concludes the dissertation. The study began as a way to investigate an idea for improving the Educational Technology course at the Midwestern university. After teaching the course for two years, it became apparent to the researcher that students were struggling with their self-regulation, mainly a personal struggle with keeping the multitude of assignments organized and completed on-time. Students were also wrestling to maintain motivation for the required course. This course is typically taught near the beginning of the students' professional education coursework, so it is an introduction to technology in the classroom and education requirements in general. What was found is

that by the end of the course, many students were overwhelmed and frustrated with the whole process of completing assignments by specific times. The goal was to simplify, not the course, but students' approach to and handling of the assignments to keep them focused and motivated.

Along the way, the study uncovered interesting outcomes. When the instructors faithfully utilized the course platform as desired by the faculty overseeing the course, students did improve their attitudes and motivation towards the class. The researcher believes that the instructors were more faithful in keeping up with the calendaring of assignments and reminders since they knew that their sections were involved in a study. While the MSLQ and Likert-type scale results were statistically inconclusive, the interviews provided a glimpse into the lives of the students taking the course. As anticipated, students' motivation levels went down during the semester as they got bogged down in the workload, but towards the end of the semester when they could see the big picture of what their new knowledge meant for their future classrooms and they felt confident in their skills and ability to successfully handle the new programs, their motivation levels increased. The researcher believes that the D2L platform was part of the motivation and self-regulation of these students. Every student interviewed mentioned how important the dates and reminders were to their overall organization. With regards to the course information on D2L, the following phrase was heard repeatedly, "I wish all my instructors did this."

The study revealed the benefits of employing a mixed methods approach. The two paradigms worked in concert to inform each other and provided additional depth to the study. While the results of the qualitative interviews and open-ended questions

cannot be generalized to a larger population, the results offered a broad picture for this study that gave the research a sense of understanding for the quantitative results. Additionally, the quantitative data provided insight for this study and has the potential to replicated in other settings. The study also revealed the realities of working with human subjects. Due to the number of sections offered, there were multiple instructors and while the course format and content is standardized, each instructor has his or her own way of doing things in the classroom. Additionally, each of the 90 students involved in the study brought their own way of approaching the course to the table. All of this meant that the study was impacted by individual personalities no matter how many controls were put in place. Going forward, this means remembering that human subject studies may not work the way one wants them to work, but that it is important to conduct the research to further the knowledge base of the field of study.

In retrospect, it is amazing to think that one intervention could have a large impact on education. Going forward, to be able to implement GTD training for pre-service teachers, faculty and in-service teachers would be very helpful for all involved in the education process. Visualizing a classroom where instructors place course content, due dates and reminders on a web accessible platform that students can effortlessly access via any internet connected device would be a huge step forward in the direction towards maintaining the motivation and self-regulation of students and teachers alike. Many innovations start small and become something much larger. The desire is for GTD training, as a classroom organizational tool, to become commonplace across disciplines and assist students in all areas to improve their learning experience and then take those experiences into their workplace.

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APPENDICES

Appendix A

Oklahoma State University Institutional Review Board

Date:	Tuesday, August 12, 2008
IRB Application No	ED08118
Proposal Title:	The Effect of Getting Things Done Software on the Motivation and Self-Regulation of Preservice Teachers in an Introductory Education Technology Course
Reviewed and Processed as:	Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 8/11/2009

Principal Investigator(s):

Amy Johnson
11416 S. 102nd E. Ave
Bixby, OK 74008

John Curry
209 Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

[X] The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Sheila Kennison, Chair
Institutional Review Board

Appendix B

MSLQ by Pintrich, Smith, Garcia, and McKeachie (1991, 1993)

Do not put your name on the form. You may quit at any time without consequence.

Please rate each of the following items based on your behavior in this class:
Your rating should be on a 7 point scale where:
1 = not true at all of me, 4 = neutral, 7 = very true of me.

Part A:

___ 1. In a class like this, I prefer course material that really challenges me so I can learn new things.

___ 2. If I study in appropriate ways, then I will be able to learn the material in this course.

___ 3. When I take a test I think about how poorly I am doing compared with other students.

___ 4. I think I will be able to use what I learn in this course in other courses.

___ 5. I believe I will receive an excellent grade in this class.

___ 6. I'm certain I can understand the most difficult material presented in the readings for this course.

___ 7. Getting a good grade in this class is the most satisfying thing for me right now.

___ 8. When I take a test I think about items on other parts of the test I can't answer.

___ 9. It is my own fault if I don't learn the material in this course.

___ 10. It is important for me to learn the course material in this class.

___ 11. The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.

___ 12. I'm confident I can learn the basic concepts taught in this course.

___ 13. If I can, I want to get better grades in this class than most of the other students.

___ 14. When I take tests I think of the consequences of failing.

___ 15. I'm confident I can understand the most complex material presented by the instructor in this course.

___ 16. In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.

___ 17. I am very interested in the content area of this course.

___ 18. If I try hard enough, then I will understand the course material.

___ 19. I have an uneasy, upset feeling when I take an exam.

___ 20. I'm confident I can do an excellent job on the assignments and tests in this course.

___ 21. I expect to do well in this class.

___ 22. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.

___ 23. I think the course material in this class is useful for me to learn.

___ 24. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.

___ 25. If I don't understand the course material, it is because I didn't try hard enough.

___ 26. I like the subject matter of this course.

___ 27. Understanding the subject matter of this course is very important to me.

___ 28. I feel my heart beating fast when I take an exam.

___ 29. I'm certain I can master the skills being taught in this class.

___ 30. I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.

___ 31. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.

Please rate each of the following items based on your behavior in this class:
Your rating should be on a 7 point scale where:
1 = not true at all of me, 4 = neutral, 7 = very true of me.

Part B:

___ 32. When I study the readings for this course, I outline the material to help me organize my thoughts.

___ 33. During class time I often miss important points because I'm thinking of other things.

___ 34. When studying for this course, I often try to explain the material to a classmate or friend.

___ 35. I usually study in a place where I can concentrate on my course work.

___ 36. When reading for this course, I make up questions to help focus my reading.

___ 37. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.

___ 38. I often find myself questioning things I hear or read in this course to decide if I find them convincing.

___ 39. When I study for this class, I practice saying the material to myself over and over.

___ 40. Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone.

___ 41. When I become confused about something I'm reading for this class, I go back and try to figure it out.

___ 42. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

___ 43. I make good use of my study time for this course.

___ 44. If course readings are difficult to understand, I change the way I read the material.

___ 45. I try to work with other students from this class to complete the course assignments.

___ 46. When studying for this course, I read my class notes and the course readings over and over again.

___ 47. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.

___ 48. I work hard to do well in this class even if I don't like what we are doing.

___ 49. I make simple charts, diagrams, or tables to help me organize course material.

___ 50. When studying for this course, I often set aside time to discuss course material with a group of students from the class.

___ 51. I treat the course material as a starting point and try to develop my own ideas about it.

___ 52. I find it hard to stick to a study schedule.

___ 53. When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.

___ 54. Before I study new course material thoroughly, I often skim it to see how it is organized.

___ 55. I ask myself questions to make sure I understand the material I have been studying in this class.

___ 56. I try to change the way I study in order to fit the course requirements and the instructor's teaching style.

___ 57. I often find that I have been reading for this class but don't know what it was all about.

___ 58. I ask the instructor to clarify concepts I don't understand well.

59. I memorize key words to remind me of important concepts in this class.

___ 60. When course work is difficult, I either give up or only study the easy parts.

___ 61. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.

___ 62. I try to relate ideas in this subject to those in other courses whenever possible.

___ 63. When I study for this course, I go over my class notes and make an outline of important concepts.

___ 64. When reading for this class, I try to relate the material to what I already know.

___ 65. I have a regular place set aside for studying.

___ 66. I try to play around with ideas of my own related to what I am learning in this course.

___ 67. When I study for this course, I write brief summaries of the main ideas from the readings and my class notes.

___ 68. When I can't understand the material in this course, I ask another student in this class for help.

___ 69. I try to understand the material in this class by making connections between the readings and the concepts from the lectures.

___ 70. I make sure that I keep up with the weekly readings and assignments for this course.

___ 71. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.

___ 72. I make lists of important items for this course and memorize the lists.

___ 73. I attend this class regularly.

___ 74. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

___ 75. I try to identify students in this class whom I can ask for help if necessary.

___ 76. When studying for this course I try to determine which concepts I don't understand well.

___ 77. I often find that I don't spend very much time on this course because of other activities.

___ 78. When I study for this class, I set goals for myself in order to direct my activities in each study period.

___ 79. If I get confused taking notes in class, I make sure I sort it out afterwards.

___ 80. I rarely find time to review my notes or readings before an exam.

___ 81. I try to apply ideas from course readings in other class activities such as lecture and discussion.

Appendix C

Demographic Data Questions:

Please answer the following questions as they relate to you this semester.

1. What is your gender? Male or Female
2. What is your current age? _____
3. How many years of college have you completed? _____
4. What grade classification are you? Freshman Sophomore Junior Senior Graduate
5. What is your current major? _____
6. What is your area of specialization (if applicable)? _____

Appendix D

Self-Assessment Questions: (pre-test collection)

Please answer the following questions as they relate to this class.

1. What is your current level of technological proficiency?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

2. What is your current comfort level with technology?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

3. What is your current assessment of your ability to successfully complete this course?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

4. What is your current level of motivation to complete this course?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

5. What is your current level of organizational skills as related to the ability to complete this course?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

6. How do you plan to organize your time and study environment for this course?

_____

_____

_____

_____

_____

Appendix E

Self-Assessment Questions: (post-test collection)

Please answer the following questions as they relate to this class.

1. What is your current level of technological proficiency?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

2. What is your current comfort level with technology?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

3. What is your current assessment of your ability to successfully complete this course?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

4. What is your current level of motivation towards this course?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

5. What is your current level of organizational skills as related to this course?

1	2	3	4	5
Very High	Above Average	Average	Below Average	Very Low

6. Was there anything you learned or experienced in this course that helped you to organize your time and study environment for this class?

_____

_____

_____

_____

_____

Appendix F

Interview Guide:

Opening information:

Thank you for agreeing to participate in this interview. It should last approximately 30-45 minutes and we will be discussing your opinions of the Getting Things Done method and the Getting Things Done software used in class this semester.

Just so you know, at no point in time will your name be used in the results of this interview. You will be assigned a pseudonym in the final results. The interview itself is an electronic document, which will be stored on my password protected laptop and the interview will be deleted after two years from my computer.

Questions:

- I would like to start with some general background questions:

7. What is your current age? _____
8. How many years of college have you completed? _____
9. What grade classification are you? Freshman Sophomore Junior Senior Graduate
10. What is your current major? _____

- I would like to ask you some self-assessment questions:

7. How would you describe your current level of technological proficiency? How has that level changed during the course of the semester?
8. How would you describe your current comfort level with technology? How has that changed during the course of the semester?
9. What is your current assessment of your ability to successfully complete this course?
10. What is your current level of motivation towards this course?
11. What is your current level of organizational skills as related to this course?

- Questions related to the Getting Things Done Method and Getting Things Done Software

1. How did the training on the Getting Things Done method assist you with course material completion?

2. How exactly did you use the Getting Things Done software during the semester?

3. How often did you use the software during the semester?

4. Were there any issues that kept you from using the software?

5. What could be changed to allow you to use the software in the course?

6. What is your opinion of IGoogle?

7. Which functions of IGoogle did you use?

8. Which functions were most/least beneficial?

9. How did you organize your time and study environment for this course? In what ways did your study and time management change as a result of using the Task Lists and To Do Lists in IGoogle?

10. In what ways did the software increase your motivation towards completing course goals?

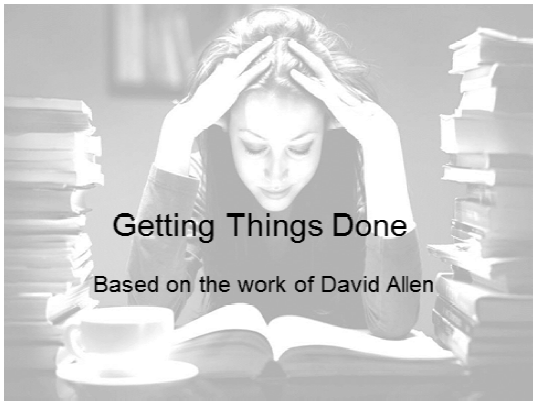
11. How did the software help you during the course? How did it hinder you during the course?

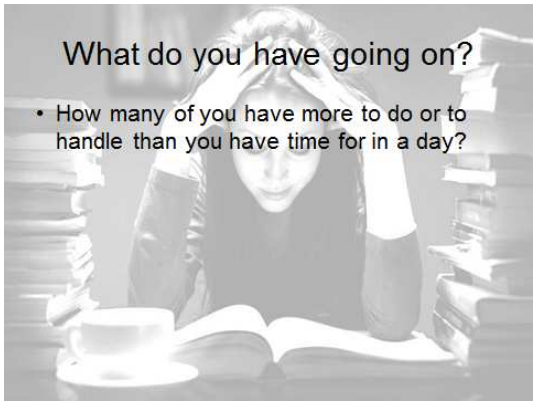
12. How could you use this software in other courses?

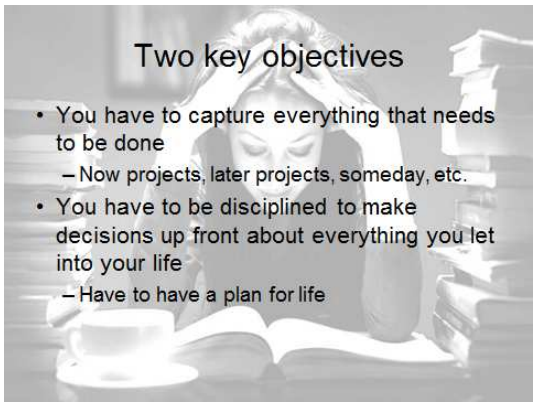
13. Would you recommend the software to others? Why or why not?

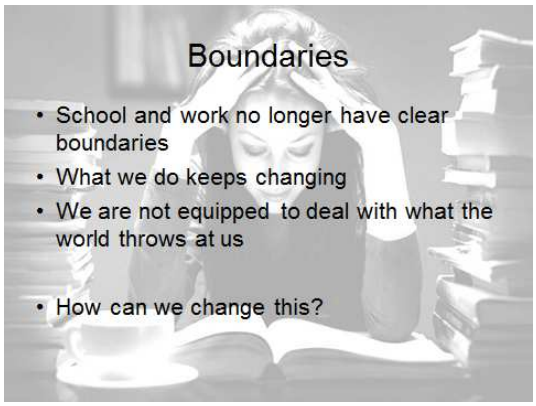
Appendix G

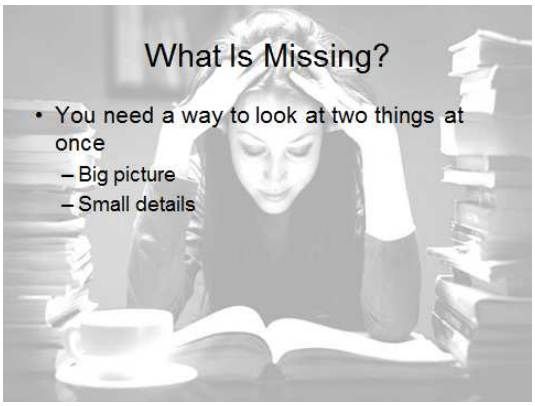
Getting Things Done PowerPoint Training Materials

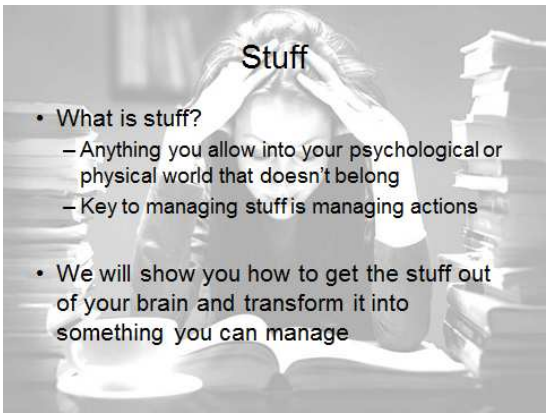


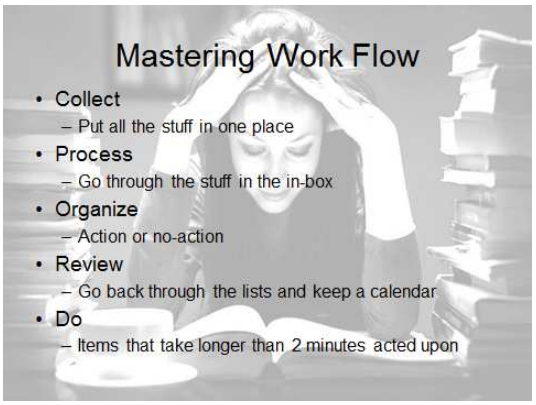







What Is Missing?
• You need a way to look at two things at once
– Big picture
– Small details


Stuff
• What is stuff?
– Anything you allow into your psychological or physical world that doesn't belong
– Key to managing stuff is managing actions
• We will show you how to get the stuff out of your brain and transform it into something you can manage


Mastering Work Flow
• Collect
– Put all the stuff in one place
• Process
– Go through the stuff in the in-box
• Organize
– Action or no-action
• Review
– Go back through the lists and keep a calendar
• Do
– Items that take longer than 2 minutes acted upon

Appendix H

Recruitment Script:

Hello, my name is Amy Johnson and I am a PhD candidate in the College of Education here at Oklahoma State University. Professor (fill in the blank) has given me permission to come to class today to speak with you about a study I am conducting as part of my doctoral dissertation.

The study is entitled, Attitudes of Preservice Teachers towards an introductory Education Technology Course. This research will hopefully provide us with future direction for Education Technology courses.

I would like to ask you to participate in the study over the course of the semester. Please keep in mind that your participation is completely voluntary. Your course grade and evaluation will not in any way be affected by your participation or lack of participation. Furthermore, no aspect of the study will be linked to you personally – i.e. I will not use your name in the study and the survey you fill out will not have your name on it.

I would also like to assure you that this study has been reviewed and received clearance through the Human Subjects Review Board. However, the final decision about participation is yours.

What would be required of you to participate in this study? If you agree, you will be given two surveys to fill out today and again towards the end of the semester as well as a demographic information sheet. The total time involved each time will be around 30 minutes.

Additionally, if any of you are interested in participating in a confidential, 30 minute interview at the end of the semester about your experiences in this class, please check the yes box regarding interview on the consent form and give me your email address as a contact. I will randomly choose up to ten people to interview at the end of the semester.

With each survey is a cover letter explaining what is going on, a consent form for you to sign and give back to me. You keep the cover letter as it has my name, phone number and email address on it in case you have any questions during the course of the semester. You fill out the surveys and give them back to me once you are finished.

Please note that if you do choose to participate in the study, please do not talk about the survey or what we are doing in class with others in this class or friends in different sections. Doing so may change your results for the survey at the end of the semester and I would like your opinion based on your personal experiences.

Thank you so much for your time.

Appendix I

INFORMED CONSENT DOCUMENT
THIS COPY IS FOR THE SUBJECT TO KEEP

Thank you for agreeing to participate in this study. This form outlines the purpose of the study, a description of the involvement required, and your rights as a participant.

Project Title:

- *Attitudes of Preservice Teachers towards an introductory Education Technology Course*

Investigators:

- *Amy Johnson, M.A. & M.S, Doctoral Candidate*

Purpose:

- *The purpose of this study will be to research the attitudes of preservice teachers towards an introductory education technology course.*

- *The participant has been asked to participate in this study in order to share with the investigator their personal opinions about and experiences in an Education Technology Course.*

- *This study seeks to gain the personal opinion of the participant regarding their personal experiences prior to completing the Education Technology Course and after completing the Education Technology Course.*

Procedures:

- *The first research tool is the Motivated Strategies for Learning Questionnaire (MSLQ). This tool is a three-page instrument to be completed by the participant at the beginning and the end of the semester. It will take approximately 20 minutes to complete this instrument.*

- *The second tool is a series of demographic questions about each respondent to provide an overall picture of the participants in the study. There are six questions that will take approximately 2-3 minutes to complete.*

- *The final research tool consists of a series of Likert-scale and open-ended questions about technology proficiency and course materials. This is a one-page form that will take approximately 5-10 minutes to complete.*

- *There is an optional interview process about the course that students can volunteer to participate in. These interviews will take place at the end of the semester and will last approximately 30*

minutes.

Risks of Participation:

- *"There are no known risks associated with this project which are greater than those ordinarily encountered in daily life."*

Benefits:

- *The benefits to the subjects include the satisfaction of being involved in a large research project. This project is unique in topical area and has not been undertaken to date. This makes the project at the forefront of research in the field.*
- *This research will also set the stage for future research with these constructs for this or other populations.*
- *Finally, the research will add to scholarly information on the topic.*

Confidentiality:

- *The results from this study will be analyzed, tabulated and summarized in order to write my doctoral dissertation.*
- *Your real name will not be used at any time during the data collection process or in the dissertation.*
- *All results will be assigned a random number so no personal identification can be made with the data.*
- *The written data will be stored for two years in a locked filing cabinet in the primary investigators office. The data will be destroyed after two years.*
- *The primary investigator and the faculty advisor will have access to the data in order to analyze, tabulate and summarize the findings.*
- *The digital interview data will be stored on the primary investigators personal computer; the data will not be placed on a network of computers at any time. The interview data will be password protected so that only the primary investigator and the advisor can access the data. The data will only be accessed in the primary researcher's office, with the door closed during review to maintain confidentiality. The interview records will be erased after two years.*
- *There are no foreseeable risks to maintaining confidentiality in this study.*
- ***The OSU IRB has the authority to inspect consent records and data files to assure compliance with approved procedures. Please note the following from the OSU IRB:***

"The records of this study will be kept private. Any written results will discuss group findings and will not include information that will identify you. Research records will be stored securely and only researchers and individuals responsible for research oversight will have access to the records. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research."

Compensation:

- *No compensation is offered for participating in this study.*

Contacts:

- *If you have any questions about the research, please contact the investigator via phone or email Amy Johnson, via phone at 918-477-2695 or via email at gokats@easytel.com*

- *You may also contact the faculty advisor, Dr. John Curry, at 405-744-8042 or via email at john.curry@okstate.edu*

- *If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-1676 or irb@okstate.edu.*

Participant Rights:

- *Your participation in this study is voluntary and you may discontinue at any time, for any reason, without reprisal or penalty.*

- *If you choose to discontinue the study, your paperwork will be destroyed.*

- *There are no potential risks for withdrawing from the study.*

- *Your participation in the study may be terminated or your results may not be included in the final study if the materials are not completely filled out.*

Appendix J

Post-Test Debriefing Letter
This letter will be given to subjects in the treatment and control groups following the post-test process.

November 10, 2008

To All Subjects in the EDTC 3123 Experiment:

The purpose of this letter is to debrief you about the experiment that you have been participating in for the last 12 weeks.

Due to concerns over the title of the study influencing the outcomes of the study, the title you were given at the beginning of the study was a working title for the study and not the actual title of the study.

The actual title of the study is *The Effect of Getting Things Done Software on the Motivation and Self-Regulation of Preservice Teachers in an Introductory Education Technology Course*. Since the title indicated that we were looking at Getting Things Done software, we removed the title from the study so that it would influence your work on that software.

Additionally, the study was looking at your motivation and self-regulation as it came to using the Getting Things Done software. Again, we did not want to influence or bias your use of the software, so you were not told which software was the focus of the study.

Those of you in the treatment group have already received training on how to use Getting Things Done software and have been using it during the course of the experiment.

Those of you in the control group will receive training on Getting Things Done software next week. This ensures that all students will be exposed to all software taught in EDTC 3123.

If you have any questions about these matters, please contact me, Amy Johnson, at gokats@easytel.com or 918-477-2695. Additionally, if you have any comments that you would like to share with me about this experience please contact me via phone or email.

Thank you for your time and your participation in the study, I really appreciate the fact that you were willing to give me your time.

Amy Johnson
Doctoral Candidate
Oklahoma State University

VITA

Amy Lynn Johnson

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE EFFECT OF GETTING THINGS DONE SOFTWARE ON THE MOTIVATION AND SELF-REGULATION OF PRESERVICE TEACHERS IN AN INTRODUCTORY EDUCATIONAL TECHNOLOGY COURSE

Major Field: Education

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Education at Oklahoma State University, Stillwater, Oklahoma in May 2013.

Completed the requirements for the Master of Science in College Teaching at Northeastern State University, Tahlequah, Oklahoma in 2003.

Completed the requirements for the Master of Arts in Industrial/Organizational Psychology at the University of Tulsa, Tulsa, Oklahoma in 1995.

Completed the requirements for the Bachelor of Science in Psychology at Kansas State University, Manhattan, Kansas in 1992.

Experience:

Fall 2006 – Fall 2008
Graduate Teaching Assistant, Department of Education, Oklahoma State University

- Course taught: Applications of Educational Technologies

Spring 2006
Graduate Research Assistant, Department of Education, Oklahoma State University

- Assisted professor as needed with research projects

Fall 2002 – Fall 2005
Adjunct Instructor, Liberal Arts Division, Tulsa Community College

- Courses taught: Personality Theories of Psychology, Developmental Psychology, Human Relations, and HR Management

Professional Memberships: AECT, Kappa Delta Phi, and Golden Key