IS THE CLASSROOM BETTER? AN INTROSPECTIVE LOOK AT E-LEARNING AND CLASSROOM FROM A GED STANDPOINT

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ABSTRACT

The present study examined whether participants assigned to a well-executed e-learning program would show greater improvement in mean test scores pre-post instructional intervention compared to those learning through the traditional classroom method. In the last ten years, many organizations have created e-learning programs with the hopes of enhancing or replacing traditional instructor-led classes (Jones, 2013). However, 41% of American Society of Training and Development's respondents admitted their organization does not possess metrics to evaluate e-learning's usefulness (Miller, 2012). One of the major challenges in incorporating and implementing e-learning programs is the ability to measure its use and effectiveness (Miller, 2012). Effective training has the potential to increase knowledge, skills, and abilities and allows employees to leverage the training results for the organization's benefit (Blume, Ford, Baldwin, & Huang, 2010 & Huang, 2009). The study found that job satisfaction and conscientiousness were negatively related to retention.

DEDICATION

This thesis is dedicated to my parents because they fostered and encouraged my curiosity and instilled in me the value of education.

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CHAPTER I

REVIEW OF THE LITERATURE

Training

Training can be defined as a systematic approach to learning and development to improve individual, team, and organizational effectiveness (Goldstein & Ford, 2002). The American Society of Training and Development's (ASTD) 2013 State of the Industry reported that organizations spend over $164 billion on employee training (Miller, 2012). Despite the high investment in training, Miller (2012) found that 41% of ASTD's respondents admitted their organization does not possess metrics to evaluate e-learning's usefulness. Evaluating programs help determine if employees have increased knowledge, skills, and abilities to leverage the training results for the organization's benefit (Blume et al., 2010 & Huang, 2009).

Aquinis and Kraiger (2009) believed training programs with appropriate training design and implementation methods can reap the most benefit. Applying theory-based learning principles, such as andragogy (Knowles, 2010), expectancy-value theory (Wigfield & Eccles, 2000) and self-determination theory (Chen & Jang, 2010), provide the trainees with opportunities to make errors with explicit instructions to encourage them to learn from the errors increases the benefits of training. Jones (2013) emphasized the importance of feedback because it allows the learner to adjust performance depending on the task. It is also important to provide adaptive guidance and consider appropriate learning styles to the trainees in training delivery (Aguinis &

Kraiger, 2009). The remainder of this literature review is structured as follows: first, an overview of the relevant learning theories for adult learning is presented. Next, the learning process is explained. After that, an overview of informal learning and benefits and cons of both e-learning and classroom learning are discussed. Furthermore, designing effective training is presented. Last, a description of learner motivation such as personality, self-efficacy, and job satisfaction is explained.

Learning Theories

Learning theories help describe the learning process and the attainment of knowledge (Knowles, 2010). According to Weiss (1990), learning is a "relatively permanent change in knowledge or skill produced by experience" (p. 182). Phillips (2010) stated that learning consists of verbal information (e.g. names, facts, or bodies of knowledge) and intellectual skills (e.g. concepts and rules needed to solve problems). The present section focuses on six learning theories that help gain a better understanding of how adults learn and interpret information: andragogy, goal setting, expectancy-value theory, social learning, behavioral learning, and cognitive learning.

Much information about the andragogy theory, also known as adult learning theory, is derived from the field of organizational development and the emphasized providing employees with the tools they needed to better perform (Kenner & Weinerman, 2011). Andragogy was developed as a specific theory to describe how adults learn (Knowles, 2010). Both Kenner and Weinerman (2011) and Knowles (2010) stated that adult learning theory focuses on learners who are self-directed and take responsibility for actions, task centered and motivated, and are

internally motivated by curiosity. Further, adult learners possess a large amount of life experience which can bring additional skills, such as higher maturity, or a better relationship with the instructor (Kenner & Weinerman, 2011). Adult learning is accomplished through reinforcement, typically in the form of practice, and encouraging the learner to run-through the activity to master the task (Knox, 1980). Jones (2013) also emphasized the importance of feedback for adult learners so they can adjust their performance for the given task.

Goal setting theory, as defined by Locke and Latham (2004), assumes that the desired behavior results from the learner's conscious goals and intentions. Goals influence the learner's behavior by directing energy and attention over time to develop strategies to complete the goals (Locke & Latham, 2004). Goal setting theories are beneficial for training programs that provide specific, challenging goals and objectives to help motivate learners to transfer training. The development of lesson plans is a form of goal setting because it explains the content the learner will master, conditions under which learning will occur, and the acceptable level of performance (Noe, Tews, & Marand, 2013).

The expectancy-value theory helps explain how an adult's self-efficacy can affect the learner's choices and performance (Jones, 2013). Jones (2013) described self-efficacy as the belief about how well a learner expects to perform on a task and how much it's valued. Expectancy-value theory is important for an adult learner to understand that all the time, work, and other factors put into the training will pay off (Wigfield & Eccles, 2000).

According to social learning theory, learning new skills and behaviors come from directly experiencing the results of using a certain behavior or by observing others and watching the results of them using the behavior or skill (Knowles, 2010). Knowles stated behaviors that are reinforced would be repeated so when employees notice the positive results of those who completed a training program, the employees currently enrolled in the program hopefully see

more value and benefit of the process. The theory states that self-efficacy also influences learning. Knowles (2010) defined self-efficacy as a person's belief he or she can accomplish a task and Noe et al. (2013) said it can be enhanced by verbal persuasion (e.g. offering words of encouragement), logical verification (e.g. perceiving a relationship between a new task and a task already completed), and modeling (e.g. having learners who previously have mastered the task demonstrate to the new learners).

Behavioral learning theory focuses on changes in the form or frequency of observable behavior (Brown & Sitzmann, 2011). This theory emphasizes opportunities for practice and feedback (Noe et al., 2013). Jones (2013) emphasized feedback is key in allowing the learner to adjust performance depending on the task and gain a grasp of the appropriate response for the given task. Learning can be maximized by a focus on closed skills specific to the job (Noe et al., 2013). A great way to maximize results is for the program to contain material that is identical to the material the employee needs to perform, the theory of identical elements (Brown & Sitzmann, 2011).

According to Phillips (2010), cognitive learning theory focuses on the attainment of knowledge, including both content and structure. The theory allows learners to link different types of learning strategies to the instructional method at hand and emphasizes that there are multiple steps in how people process information (Phillips, 2010). Piaget believed cognitive development occurs because of self-motivation and a learner must be presented with challenging opportunities for engagement and problem-solving (Pruitt, 2011). Learners first gain awareness of the topic and grasp an understanding of concepts and terms then they apply the new knowledge to complete the task efficiently (Phillips, 2010).

The Learning Process

The learning process clarifies the physical and mental development necessary for learning (Noe et al., 2013). According to Phillips (2010), the learning process contains a number of steps for the learner to gain the knowledge: (1) declarative, awareness of important information (e.g. "knowing that"), (2) procedural, mastering concepts, rules, and principles (e.g. "knowing how"), and (3) contextual knowledge, applying concepts, rules, and principles (e.g. "knowing when and why") (Phillips, 2010). Pruitt (2011) believed learning occurs when a mediator, such as a teacher, guides the learner in a specific direction, such as a certain topic, and helps interpret the information. The learner then is receptive to the material and an engaged in the learning process. The learner has grasped the meaning of the topic when the significance and purpose of the learning activity is delivered in a applicable way (Pruitt, 2011). To enhance the transfer of the learning knowledge for adult learners, e-learning should contain a learning process that focuses on developing skills and knowledge valuable in the desired context (van der Locht, van Dam, & Chiaburu, 2013 2013). The learning process is broken down into three different categories: verbal and visual information, problem-oriented strategy, and practice strategy,

Verbal (e.g. words) and visual (e.g. pictures) information help the learner become aware and understand the facts, rules, concepts, and formulas needed for the training context (Phillips, 2010; Sojka & Giese, 2001). The learner's process preference determines the level of interpretation that will occur (Sojka & Giese, 2001). Sweller (1999) warned about potential overload that can occur by utilizing only one of these. An overload can occur when there is a video demonstrating a concept with coinciding on-screen text (Sweller, 1999). The learner has trouble simultaneously focusing on both the video and the text. To solve the overload, Sweller

(1999) recommended removing the text and replacing it with a verbal narration. A Problem-oriented strategy is the ability to search through long-term memory to locate and apply the desired information (Phillips, 2010). Long-term memory enables the learner to relate new material to previously acquired knowledge. Easier, quicker retrieval subsequently helps the learner apply previous material to the present situation. The best way to increase the effectiveness of long-term memory is to provide the learner with problems that are relevant and specific to the material (Ross & Rakow, 1986).

The goal of practice strategy is to learn how to use and apply the newly learned knowledge effectively (Phillips, 2010). Active involvement is a subset to practice strategies. Webster and Hackley's (1997) guidelines for distance learning stated "learning is best accomplished through active involvement of the students" (p. 1284). Active involvement is accomplished through ample practice so the learner develops an understanding of the deeper, structural features of a task or learning content (Newell, Rosenbloom, & Laird, 1989). Practice increases the learner's working memory. Repetition also improves transfer to the learner's long-term memory. Memory is important throughout the learning process to understand the material, store and recall knowledge when needed, practice the material, and receive feedback. Feedback allows the learner to ask questions or address concerns and lets the teacher help correct needed areas of performance to keep the learner on track (Phillips, 2010).

E-learning, Classroom learning, and Informal Learning

E-learning is the distribution of the learning materials through the internet (Noe, Tews, & McConnell Dachner, 2010). E-learning programs offer learners greater control of their own

learning and to self-pace throughout the programs (Derouin, Fritzsche, & Salas, 2005). For example, a learner can work on the program as quickly or slowly as he desires. In addition to self-pacing, e-learning programs allow learners to control the sequence of learning material and the content of the material (Derouin et al., 2005). Goldstein and Ford (2002) and Welsh, Wanberg, Brown, and Simmering (2003) identified stable training across situations, reduced information overload, and more easily created identical elements from training to on-the-job as other advantages to e-learning over a classroom setting. According to ASTD's State of the Industry report, organizations have showed a shift towards e-learning (Miller, 2012). Miller (2012) also reported that there is an increased use of informal learning.

Informal learning is learner initiated, occurs on an as-needed basis, is motivated by intent to develop, involves action and reflection, and does not occur in a formal classroom setting (Noe et al., 2013). Informal learning is a process that starts with the desire to acquire knowledge, followed by practice and application, feedback, and, lastly, reflection (Noe et al., 2013; Watkins & Marsick, 1992). This type of learning can help older adult learners who prefer to set their own pace (Noe et al., 2013). Sitzmann, Kraiger, Stewart, and Wisher (2006) found informal learning to be important in helping show that e-learning can be more effective than the classroom when learners can practice the material and receive feedback. Sitzman et al. (2006) found that e-learners helped improve the learners' declarative and procedural knowledge.

A benefit of e-learning is the greater flexibility and availability in teaching multiple instructional methods as compared to classroom learning, which only allows for one instructional method (Sitzmann et al., 2006). E-learning allows learners to self-pace, which provides them the freedom to enter and exit the online learning as desired (Derouin et al., 2005).

Welsh et al. (2003) identified disadvantages to e-learning, including lack of internet access, interaction among peers, and technical skills needed to manage the internet and online

instruction. Burke, Scheuer, and Meredith (2007) believed the importance of social interaction in the classroom allows learners to hypothesize, question, interpret, explain, and evaluate issues and problems amongst themselves. Sitzmann et al. (2006) found that when the participants' satisfaction with the learning environment was controlled (i.e., classroom vs. online), classroom learning was more effective but 44.2% of the variance between the two conditions was due to age, especially when the online learning contained older participants and the classroom contained younger. However, Noe et al. (2010) found older learners acted more favorably to active learning methods that, in turn, influenced learner engagement.

According to DeRouin, Fritzsche, and Salas (2005), e-learning appears very enticing with its availability and cost-effectiveness but one of the major challenges in incorporating and implementing e-learning programs is the ability to measure its use and effectiveness (Miller, 2012). Forty-one percent of American Society of Training and Development's (ASTD) respondents admitted their organization does not possess metrics to evaluate e-learning's usefulness (Miller, 2012). For those organizations that do evaluate their programs, most are built upon the foundation of the ADDIE model (Reinbold, 2013). According to Chevalier (2011), ADDIE consists of five phases: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. The model is a systematic procedure that helps create training programs from the initial request to evaluation. The phases target training needs, learning task, performance measure, and the method of delivery (Reinbold, 2013). Reinbold stated the purpose of ADDIE is to act as a guide to get the best possible training solution and the phases can be done concurrently and not necessarily in a linear order.

Analysis

Analysis is the first phase of the model and Chevalier (2011) defined it as identifying gaps between the current performance level and the desired level, Reinbold (2013) referred to this as a

needs analysis and it identifies the knowledge, skills, and attitudes necessary to close the performance gap (Chevalier, 2011). This phase involves background research and information gathering (Reinbold, 2013) such as observations or interviews. Background work is necessary to establish a baseline, such as task accomplishment (e.g. productivity and time), intermediate outcomes (e.g. retention), or desired business outcomes (e.g. profitability) (Chevalier, 2011).

The baseline helps identify the metrics needed to create the evaluation of the training (Chevalier, 2011). After a training need is found, a task analysis is conducted, such as recording knowledge-based tasks, to determine whether a student scored at a certain level and can also determine the instructional design used (Reinbold, 2013).

Design

The next phase in ADDIE is design and uses the information gathered in the analysis to create a plan or outline of the training (Reinbold, 2013). The focus of this phase is to identify the learning objectives and the steps needed to reach the goal (Reinbold, 2013). Many organizations do not take the time to design training programs that align the needs analysis to the training design (Chevalier, 2011). The learning objectives provide information about where and why training is needed (Dierdorff & Surface, 2007). There are four characteristics of effective learning objectives according to Noe et al. (2013): (1) describe the knowledge goals (e.g. solving a math problem) expected, (2) identify the purpose and expected outcomes of training activities, (3) describe each training session and the overall program, and (4) align the training needs analysis to help employees understand why they need training and what they need to learn.

Develop

The develop phase is where the training program is established (Reinbold, 2013). Reinbold (2013) mentioned that this phase may overlap with design and analysis and includes identifying, pre-training, and post-training work (Chevalier, 2011). Ideally, programs should

be piloted, evaluated, and refined (Chevalier, 2011). The pilot phase should include feedback about the training program to help improve and evolve the training (Reinbold, 2013).

Implementation

According to Chevalier (2011), implementation is the delivering of the training to the target audience and should contain identical elements to the participants' jobs. Learners absorb most efficiently when training programs are well constructed (Knowles, 2010). This means the program contain relevant material, clear objectives for practice and feedback, learner interaction, and a supportive teacher (Phillips, 2010).

Evaluation

Evaluation is the last step and can be the greatest failure of the ADDIE model when it doesn't systematically evaluate the effects of the training to the desired environment (Chevalier, 2011). Kirkpatrick's (1975) evaluation framework helps determine a program's effectiveness and consists of four levels: reaction, learning, behavior, and results.

Kirkpatrick (1975) stated the level of reaction, also coined summative evaluations (Reinbold, 2013), refers to how well the participants like the given program and simply asks for the participants' satisfaction. Knowing the level of satisfaction is important because learners who enjoy a learning program are more likely to gain maximum benefits from the program (Kirkpatrick, 1975). Maximum learning comes from interest and enthusiasm. According to DeRouin et al. (2005), most organizations that evaluate programs only rely on the reactions portion of Kirkpatrick's (1975) evaluation framework. Employees generally give a favorable reaction with e-learning programs and report satisfaction with e-learning over other learning method (Derouin et al., 2005). A favorable reaction does not guarantee learning and an unsatisfied reaction can results in no learning because it takes effort and motivation to learn and "turned-off" participants won't put in the effort (Kirkpatrick, 1975).

The second stage of Kirkpatrick's (1975) evaluation framework is learning. Evaluating the objective-learning results can help increase the reliability of the training program and help sell future programs. Kirkpatrick (1975) stated four main processes that must be done to evaluate learning: (1) the learning of each participant is recorded to analyze quantitative data, (2) a before-and-after approach is utilized so any learning can be related to the program, (3) if possible a control group is used to compare with the experimental group, and (4) the evaluation results should be analyzed statically to prove the amount of learning in terms of correlation or level of confidence.

The third level of evaluation, employee behavior, is more commonly referred to as the transfer of training from the e-learning program to the job (Frash Jr, Kline, Almanza, & Antun, 2008 2008). This level determines if the principles and techniques learned from the training are applied back on the job (Frash Jr et al., 2008).

The fourth level is results. Frash Jr et al. (2008) defined this level as the ends, goals, or desired results. This level is where a business would like to see a reduction in cost and a return on investment (Frash Jr et al., 2008). The analysis of before-and-after approaches help show findings of the training (Kirkpatrick, 1975).

In terms of aligning evaluating training to e-learning programs, DeRouin et al. (2005) found that most organizations evaluate learning outcomes for e-learning programs but several studies reported no difference in the posttest scores of students in e-learning versus traditional training delivery. DeRouin et al. (2005) did discovered two meta-analyses that support e-learning's potential for improving learning outcomes.

Hypothesis 1: Participants learning the material via GED website will exhibit greater increases in mean performance from pre to posttest than those participants who are learning the material via the traditional classroom setting.

Learner Motivation

To succeed in an e-learning program, the learner must maintain motivation in an informal learning environment. Locke and Latham's (2004) define motivation as "internal factors that impel action and external factors that can act as inducements to action" (p.388). Maintaining motivation is the responsibility of the learner (Noe et al., 2010). Knowles (2012) identified several techniques to increase the perceived value of the program to employees, including telling stories of previous trainees' successes, discussing examples that prompt trainees' ideas about good and poor work, or offering practice that is relevant to the practical setting). As a result, it's important to examine traits, such as conscientiousness, age, and job involvement, which might affect the likelihood that a person will be motivated to stay in an informal, e-learning program. (Aguinis & Kraiger, 2009).

Barrick, Mount, and Strauss (1993) defined conscientiousness as the degree of self-disciplined, responsible, organized, dutiful, dependable, and behaving in a manner that meets others' expectations. Those high in this trait possess high need for achievement, set difficult work goals, and are highly motivated (Barrick, Mount, & Strauss, 1993). Noe et al. (2013) stated the personality traits conscientiousness, emotional stability, extraversion, and openness to experiences have positive impact to learning environment. In addition, these traits have all

shown positive relationships with motivation to learn, training ability, self-perceptions of learning ability, and self-development activities (Noe et al., 2013).

Agreeableness is defined as the extent to which a person is polite, flexible, tolerant, trusting, and cooperative (Barrick & Mount, 1991). Agreeableness has received little attention in studies regarding learning environments despite research showing the trait is unrelated to training proficiency in formal development activities but Noe et al. (2013) believed agreeableness might be relevant to informal learning since informal learning depends on individuals who open up to others and risk revealing a lack of knowledge in the given topic.

Hypothesis 2A: Conscientiousness is positively related to retention.

Hypothesis 2B: Agreeableness is positively related to retention.

Self-efficacy, defined as an individual's belief in their ability to successfully perform a specific task (Guthrie & Schwoerer, 1994), is another variable that can increase a person's likelihood of completing a task. Possessing a high level of self-efficacy increases confidence that an individual can complete a given task (Dierdorff, Surface, & Brown, 2010). Self-efficacy posits that employees receive the maximum benefit from their training when they believe they can comprehend the content of the program, the results of the training are linked to positive outcomes, and they value those outcomes. Individuals with high self-efficacy execute a task better than those with lower self-efficiency (Guthrie & Schwoerer, 1994).

Hypothesis 3: Participants higher in self-efficacy will show greater increases in math scores from pre- to post than those lower in self-efficacy

Locke (1976) defined job satisfaction as a pleasurable or positive emotional state from the appraisal of a job or job experience. Motowidlo (1996) defined self-reports of job satisfaction as "judgments of the favorability of the work environment" (p.

176). When job satisfaction is recorded as an emotional aspect, affect at work can be seen as an indicator of the satisfaction (Brief & Weiss, 2002). It is important to consider the components of job satisfaction and how those components may be related to resulting behaviors. Job satisfaction is shown to highly correlate with affective commitment (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). Affective commitment is an emotional attachment, identification, and involvement in the organization. Affective commitment is thought to increase the sense of obligations (Meyer & Allen, 1984). Besides being highly correlated to affective commitment, job satisfaction was found positive but not significant in determining employees' motivation to transfer learning (Egan, Yang, & Bartlett, 2004).

Hypothesis 4: Job satisfaction is positively related to retention.

CHAPTER II

METHOD

Participants

Participants were manufacturing workers at a large manufacturing company in the southeastern United States participating in the GED program offered through the company. Drop-out from the GED program is typical and expected every year. The sample size started at 69 and dropped to 30. Of those 30 participants, only 28 completed the pre and post TABE tests: 20 in the website condition and eight in the classroom. Six participants failed to fill out demographic information. Most of the participants who completed the program were female (*n*=18, 72%) and white (*n=15*, 60%). The remaining sample consisted of Caucasians (*n*=15*,* 60%) and Hispanics (*n*=10, 40%). Information regarding age (mean=44.56), ethnicity, gender (female *n*=17, 68% and males, *n*=6, 24%), tenure with company (mean=12.92 years), and last completed grade level (mean=9) of the participants was collected. Table 1 provides sample demographics information from all participants in both the pre- and post- instructional intervention.

Design

I used a between subjects design with the learning condition assigned to the participants as the independent variable. This treatment allowed the participants to be investigated only under one treatment. The participants were assigned to either learning the material via the classroom setting or learning thru the GED website. Figure 1 shows the expected outcome of the study based on hypotheses to be discussed later.

The design contained the possibility to examine other variables that might affect or be related to learning. Ethnicity is such a variable because of the large percentage of the sample size is Hispanic; furthermore, it is assumed a number of the Hispanic participants speak minimal English. The last grade completed is another variable that might affect learning since some participants are learning the material from scratch while others only need to review the material.

Procedure

The company used the Test of Adult Basic Education (TABE) which is the most comprehensive and reliable assessment test in adult basic education (CTB/McGraw-Hill; see Appendix A). The TABE determines what knowledge the employees lack in regards to Mathematical Reasoning. The TABE is designed to shed light on the content areas where additional assistance is required (TestPrepReview, 2014). The TABE allows the instructor to identify what the current grade level, which helps verify the readiness for training.

After completing the initial assessment, the students were assigned one of two settings: classroom or website. The GED teacher picked which manufacturing plants were in each

treatment group so that all participants in a given plant received the same treatment.

The participants' information remained confidential to the GED teacher and anonymous to me, so we de-identified the data. The participants recorded their work number on the TABE test and the last four digits of the SSN on the surveys. The head GED teacher wrote the last four digits of the SSN on the bottom of the TABE answer sheet after the participants completed. Company policy does not allow any paperwork to ask for demographics; as a result, the GED teacher received the demographic information from Human Resources. The teacher recorded the demographics on the back of the participants' TABE answer sheet, copied the bottom portion of the TABE that consists of the answers and the demographics, and gave the copies to me.

Measures

Organizational Commitment and Job Satisfaction

I measured organizational commitment using Meyer and Allen's (1997) Organizational Commitment Questionnaire (See Appendix E). Job satisfaction was measured using the Job Descriptive Index, JDI (See Appendix B). The JDI measures job satisfaction, which is defined by Smith (Smith) as the feelings a worker has about his job. The final version of the JDI contains five sub dimensions: satisfaction with coworkers, work, pay, opportunity for promotion, and supervision. Participants mark a "Y" next to items that they feel describes that aspect of the job, a "N" if the item doesn't describe that aspect of the job, and "?" if the participant was undecided (Kinicki, McKee-Ryan, Schriesheim, & Carson, 2002 & Carson, 2002). According to Kinicki et al. (Kinicki et al.), positively worded items are scored 3 for Yes, 1 for Uncertain, and 0 for No,

and negatively worded items are scored 0 for Yes, 1 for Uncertain, and 3 for No.

Self-Efficacy

I measured self-efficacy using a three-item scale derived from Dierdorf and Surface's (2010) self-efficacy questionnaire. Each item began with the stem "I feel confident in my ability to…" followed by three questions regarding the participant's perceived ability to complete the GED course (see Appendix D).

Personality

I measured the Five Factor Model of personality using the 50-item International Personality Item Pool (IPIP) personality questionnaire (See Appendix C). The scale assesses extroversion, openness to experience, agreeableness, conscientiousness, and emotional stability (Goldberg, 1999). The participants responded to each item in the way that most accurately described them on a five-point Likert scale (1 = completely inaccurate to 5 = completely accurate).

Analyses

I performed three sets of analyses: retention analyses, learning condition analyses, and posttest only analyses. Retention analyses were performed using logistic regression to determine whether a participant had dropped from the GED program. Cox regression could not be used because the specific date of termination was not available for each participant. Logistic regression was performed with each of the Big 5 items, overall job satisfaction, organizational

commitment, self-efficacy, the demographic information, and the overall math scores, reading scores, and language scores as predictors of retention.

For the learning condition analyses, I conducted a mixed model analysis of variance with a repeated measures factor with two levels, pre vs post, and a between-subjects factor with two levels, e-learning vs. classroom. The analysis focused on the interaction of the two factors, as illustrated in Figure 1. As shown in the figure, it was expected that the two groups would perform about equally on the pretest, with differences between the two learning condition groups increasing on the posttest. The test of the interaction determined if there was a difference between pre-post change scores in the two groups. Main effects of the between-subjects and repeated measures factors were also examined.

For posttest only analyses, independent t-tests were performed to examine the relationship between participant reactions and other variables, such as learning condition. I also had participants record their reactions to their learning conditions and the overall GED program (Kirkpatrick, 1976). The learning condition was the dependent variable.

Table 1 Sample Demographic Information

	Pre Learning Intervention		*Post Learning Intervention*	
Variable	*n*	*%*	*n*	*%*
Gender				
Male	36	52.9	7	28.0
Female	32	47.1	18	72.0
Ethnicity				
White	16	23.5	15	60.0
Hispanic	47	69.1	10	40.0
African American	5	7.4	0	00.0
Age				
20-25	2	2.9	0	0.0
26-30	8	11.8	2	8.0
31-35	8	11.8	4	12.0
36-40	15	22.0	4	12.0
41-45	9	17.0	3	12.0
46-50	12	17.7	6	24.0
51-55	6	8.8	1	4.0
56-60	7	10.3	5	20.0
61-65	1	1.5	0	0.0
Tenure				
>1-5 years	25	36.8	4	16.0
6-10 years	11	16.2	6	24.0
11-15 years	12	17.6	7	28.0
16-20 years	9	13.2	3	12.0
21-25 years	5	9.9	3	12.0
26-30 years	4	5.9	2	8.0
31-35 years	1	1.5	0	0.0
36-40 years	1	1.5	0	0.0
Last Grade Completed				
6th grade	6	9.0	3	12.0
7th grade	3	4.5	1	4.0
8th grade	7	10.4	4	16.0
9th grade	16	23.9	5	20.0
10th grade	11	16.4	1	4.0
11th grade	13	19.4	6	24.0
12th grade (Didn't graduate)	11	16.4	5	20.0

Note. Percentages exclude missing data and add up to 100.

CHAPTER III

RESULTS

Retention Analyses

Hypothesis 2A and 2B stated that participants higher in conscientiousness and agreeableness, respectively, were more likely to remain in the GED program. The results of a logistic regression showed that those lower in agreeableness (B = -.091, p<.05) were more likely to stay in the program. The study correlations are summarized in Table 3.

Hypothesis 4 stated that participants who reported higher job satisfaction were more likely to remain in the GED program over those who reported lower levels. The results of a logistic regression analysis showed those with lower job satisfaction (B = -1.347, p<.05) were more likely to stay in the program.

Learning Conditions Analyses

Hypothesis 1 stated that participants in the online condition would have greater mean pre- post intervention math score differences than those in the classroom condition. This hypothesis was not supported. Three tests were run: the pre-post difference (F= 1.413), the

main effect of the group (F= 1.772), and the interaction (F= .417). Table 2 shows the two-way table of learning condition and pre-post mean scores. Unfortunately, the absence of an interaction effect does not support Hypothesis 1.

Hypothesis 3 stated that participants with higher self-efficacy would show greater increases in math scores from pre- to post than those lower in self-efficacy. The pre-post mean score is the dependent variable. Due to a misunderstanding, the instructor had only 24 of those who completed program fill out the self-efficacy questionnaire. A two-way analysis of variance was conducted with pre vs post as a repeated measures factor and self-efficacy scores as a continuous between-subjects factor was conducted. In the analysis, the main effect of Pre vs Post was not significant ($F(1,22)=1.244$, $p > .05$). In addition the main effect of Self-efficacy was not significant ($F(1,22)=0.013$, $p > .05$). Finally, contrary to the expectations of Hypothesis 3, mean math scores of those with higher self-efficacy did not increase more than those with lower self-efficacy ($F(1,22)=0.929$, $p > .346$).

Posttest Only Analyses

Posttest only analyses evaluated the participants' reactions to the GED program and the assigned learning condition. Reaction was measured to understand how well the training was received by the participants (Kirkpatrick, 1975). Twenty-nine participants responded to three categories: reaction to the overall GED program, satisfaction regarding their assigned learning condition, and the benefits the program provided: (1) understanding material, (2) practicing material, (3) feel prepared for GED test, and (4) remembering material. For the overall GED program, on a scale of 1 (poor) to 5 (excellent), website participants (n=21) rated a mean score

of 3.76 and classroom participants (n=9) rated a mean score of 4.78. Equal variances assumed (t = - 3.238, p = .003), the classroom participants rated the overall GED significantly higher than the ebsite participants. The next item was rating of the participants' learning condition. The website was given a mean score of 3.50 (out of 5) and the classroom had a mean rating of 4.78. The last item asked participants to simply mark all of the following benefits they think they received from the program: 72.4% marked "understood new material" (n = 21, t = -1.483), 79.3% marked "practiced material" (n = 23, t = -.019), 37.9% marked "felt ready for the GED" (n = 11, t = -1.054), and 58.6% marked "remembered the new material" (n = 17, t = -2.489).

Table 2 Two-way table of means between learning condition and pre-post mean scores

	Pre-Instructional mean math score	Post-Instruction mean math score	Row Main Effect/ marginal means
Classroom participants *n*=8	84.8	86.03	1.23
Website participants *n*=20	87.33	91.5	4.17
Column Main Effect/ marginal means	2.53	5.47	

Table 3 GED Program Retention Rate Correlations

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Participant Remained in program	1													
2. Openness	.028	1												
3. Conscientiousness	-.147	.305*	1											
4. Extraversion	-.008	.441**	0.022	1										
5. Agreeableness	-.262*	.158	.558**	.071	1									
6. Emotional Stability	-.211	.076	.435**	.158	.421**	1								
7. Job Sat	-.206	-.297*	-.225	.154	-.152	.118	1							
8. Age	.191	-.367**	-.085	-.133	-.158	-.165	.015	1						
9. Ethnicity	-.028	-.292*	.326**	-.332**	.324**	.249*	-.154	.390**	1					
10. Gender	.108	-.078	-.004	.083	.014	-.12	.147	.226	.059	1				
11. Last Grade	-.027	.088	.079	.12	.19	.295*	.245*	-.265*	.155	.085	1			
12. Tenure	.155	-.157	-.18	-.032	.051	-.203	-.044	.580**	.295*	.019	-.179	1		
13. Location Of Last Grade	-.153	.378*	.271	.038	.084	.119	-.406*	-.505**	.523**	-0.21	.078	-.259	1	
14. Self-Efficacy	-.215	.295*	.305*	.087	.301*	.198	-.279*	-.048	.19	-.13	.253*	-.024	.275	1

Note. *Correlation is significant at the 0.05 level. **Correlation is significant at the 0.001 level

Table 4 Reactions effect on Post Instructional Intervention Scores

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Post Math Score	1										
2. Math Hours	.082	1									
3. Overall GED Program Rating	.106	.360	1								
4. How much Program will help you get GED	.439*	.211	.550**	1							
5. Benefit: Understood New Material	-.062	.021	.375*	.085	1						
6. Benefit: Practiced Material	-.085	.285	.130	.158	.021	1					
7. Benefit: Felt ready for GED	.032	-.087	.283	.266	.365*	-.043	1				
8. Benefit: Remembered Material	.171	.210	.216	.070	.344	.057	.129	1			
9. Liked Website	-.124	.272	.336	.093	.111	-.063	.074	-.382	1		
10. Liked Classroom	-.102	.461	.357	.[c]	-.189	-.189	-.378	-.189	.[c]	1	
11. Attend Future Classes	.033	.156	.105	.683**	.293	.537*	.258	-.174	.258	.[c]	1

CHAPTER IV

DISCUSSION

The present study's results provide insight into the effectiveness of e-learning versus classroom learning and contribute to the knowledge based of e-learning in organizations. Although the findings were not significant, the results show that adults' learning skills increase over a period of time due to the intervention of an e-learning program. Unfortunately, there was no interaction between the math scores pre- post intervention and learning condition. The present findings suggested that job satisfaction and agreeableness were negatively related to participants' retention rate (whether a participants left the GED program). The negative relationship probably exists because employees are paid twenty on-the-clock hours for participating in the GED program. It is believed that people who are more unhappy with their jobs would participant in any program that allows them to get out of work.

The results showed the marginal mean for the classroom's scores pre-post intervention was 1.23 points and the marginal mean for the website's scores pre-post was 4.17 points. The website's larger marginal mean could be the result of the website's ample practice sections that provided step-by-step feedback for solving a given problem. These results coincide with Sitzmann et al.'s (2006) findings that e-learning has been found more effective than the classroom when learners have the ability to practice the material and receive feedback. Jones (2013) discussed that learner's must have regular, immediate, and clear feedback so that he can adjust his performance with the demands of the lessons. Phillips's (2010) study that the goal of

practice strategy is to master active involvement, which is accomplished through abundant practice and allows the participant to develop a deeper understanding of the learning content.

The present study's dropout rate was 58.1%. It was not known what learning condition the participants were in when they dropped but Park and Hee Jun (2009) found that attrition rates for self-directed e-learning programs can be as high as 70-80%. Due to the high dropout rate, multiple factors were examined to determine retention rate. The data was analyzed using logistic regression. Many factors were not significant, which are discussed in the limitations section. The results showed participants lower in agreeableness were more likely to remain in the GED program. Although Noe et al. (2013) believed agreeableness may be relevant to informal learning, the authors admitted agreeableness has received little attention in studies regarding learning environment. The present study wanted to examine the effect agreeableness would have on retention rate. While Barrick et al. (1993) stated that those in conscientiousness have a high need for achievement and are highly motivated, prompted the assumption for the present study that those higher in this trait will remain in the program. However, results do not support this research. Literature cites that job satisfaction is highly correlated to affective commitment (Meyer et al., 2002) and, as a result, increases a participant's sense of obligation to task. Logistic regression was performed and those lower in job satisfaction ($B = -1.347$, $p < .05$) were more likely to remain in the program.

Deirdorff and Surface (2010) stated people high in self-efficacy have more self-confidence to complete a given task than their counterpart. An independent t-test was conducted to determine if those higher (responses three or higher) in self-efficacy obtained higher marginal mean score differences pre-post intervention. Results concluded that self-efficacy does play a

role in score differences between the conditions ($F = 2.77$, $p<.05$); however, contrary to the literature, those lower in self-efficacy acquired the greater score differences pre-post.

The present study helped evaluate e-learning effectiveness in a real-world setting. According to DeRouin et al. (2005) and Guthrie and Schwoerer (1994), researching e-learning's value in organizations is important; yet, there is little research done to its effectiveness. The five phases of ADDIE (analysis, design, develop, implementation, and evaluation) is a systematic methodology to evaluate training and measure the program (Chevalier, 2011). The last step is evaluation and it assesses the effects of the training to the target group. Kirkpatrick's (Kirkpatrick) evaluation framework also helps address a program's effectiveness. The present study utilized the first two of four steps in Kirkpatrick's model: reaction and learning. Reaction level is important to explain the participants' satisfaction levels. Learners who enjoy a program are more likely to reap maximum benefits from the program (Kirkpatrick, 1975). This step is most used by organizations; however, just having a satisfied reaction to a program does not guarantee the participant has learned the material (Derouin et al., 2005). The next step in the model is learning, which assessed the objective-learning results to increase the reliability of the program (Kirkpatrick, 1975). In addition to obtaining reaction and learning, the present study incorporated Kirkpatrick's (1975) four main processes: collecting quantitative data using a before and after design, comparing the website group to a control group (classroom), and performing logistic regression and independent t-test to statically prove learning outcomes.

Future Research

Future research might replicate the present study with a larger sample size to determine the existence of the hypothesized relationships. The study should longitudinally follow the

participants through the program and see how well they perform on the actual GED test. Longitudinally following the participants will help the researchers see if transfer of training (Kirkpatrick's third step of evaluation) has occurred from the e-learning program to the GED test.

Another avenue for future research is to reexamine the effects of demographics and other factors (e.g., job satisfaction, personality, and self-efficacy) on retention rates. Survival analyses can be conducted if the researchers are able to record *when* the participants left the program, instead of *whether* participants dropped, to help gain more information on the factors causing the drop out. This analysis might also help determine the effects these factors have on the marginal means.

The last area for future research is to conduct this study with a more elaborate e-learning program. The current study used Google sites, YouTube videos, and practice problems from another website. A more detailed website might better incorporate all of Philips's (2010) types of learning knowledge: declarative knowledge (awareness of important information), procedural knowledge (mastering the concepts, rules, and principles), and contextual knowledge (applying the concepts, rules, and principles). Future researchers could also provide participants the opportunity to access to the website outside of work to increase convenience and thus participation and completion rates.

Limitations

The large number of null results of my data prompted me to go back and ensured I entered all the data in correctly. Ruling out miscoding of the data, the null results may be due to a variety of other reasons. Some of the participants might not have understood all the information

in the surveys. The GED teacher mentioned it took certain individuals longer to fill out the packets and had multiple questions regarding the content. This may be why some of the analyses results contradicted what previous research reported. The large Hispanic sample (n=47, 69.1%) in the pretest might not have understood what they were being asked on the questionnaires. This may be the reason for a high number of survey questions left blank, answers to corresponding questions responded in a contradictory manner, or some packets having the Spanish words written besides the equivalent English word.

One of the biggest limitations to the present study was lack of power due to the small sample size. The small size limits the generalizability of the results and possibly skewed some analyses.

Other limitations may have occurred due to the fact that I was not present while the post data was being collected. The GED teacher said she was short on time and couldn't post test all students who were still in the program. This may explain the low sample size, especially from the classroom participants. The GED teacher being short on time may explain why some students only filled out the TABE assessment test and not the psychological factors packets (e.g. reaction to the program, job satisfaction, and self-efficacy).

Another limitation may be that the website participants possibly didn't utilize the practice problems as much as they should. The GED teacher said when the participants went through all the material and lessons the site provided, she didn't want to hold them back from other subjects so she post tested them and moved on to another subject. The classroom people took longer to get through all the material and they weren't even all the way through when I asked for her to posttest them for the purpose of the thesis.

CHAPTER V

CONCLUSION

The results of the present study may not have supported many of the hypotheses or coincided with the literature; however, this study builds on the results of DeRoiun et al. (2005 who performed two meta-analyses that support e-learning's ability to improve learning outcomes. E-learning programs are gaining popularity, yet 41% of respondents disclose that their organization does not evaluate these programs (Miller, 2012). An important implication of the present study is the value of evaluating training programs to gauge participant reactions to the training, reasons for dropouts, and the achievement of organizational goals by the program. Organizations looking to incorporate, or improve, e-learning programs should consider demographics and other factors, such as personality and satisfaction that may put participants at risk of dropping from the program.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

MEMORANDUM

TO: Taryn Schrader **IRB #14-180**
Dr. Brian O'Leary

FROM: Lindsay Pardue, Director of Research Integrity
Dr. Bart Weathington, IRB Committee Chair

DATE: January 21, 2015

SUBJECT: IRB #14-180: Is the classroom better? An introspective look at e-learning and classroom from a GED standpoint

The IRB Committee Chair has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project #14-180.

Since your project has been deemed exempt, there is no further action needed on this proposal unless there is a significant change in the project that would require a new review. Changes that affect risk to human subjects would necessitate a new application to the IRB committee immediately.

Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page http://www.utc.edu/irb or email us at: instrb@utc.edu .

Best wishes for a successful research project.

APPENDIX B

CONSENT FORM TO PARTICIPANTS

The Last Four Digits of your SSN_____

We want to make sure we are meeting your wants and needs!

Please take some time to fill out these surveys to help us get better.

We want to know where we can help improve your GED program.

1. These surveys are confidential. We will not share this information.
2. You can stop the survey at any time
3. You must be 18 years or older

APPENDIX C

JOB DESCRIPTIVE INDEX

People on Your Present Job

Think of the majority of people with whom you work or meet in connection with your work. How well does each of the following words or phrases describe these people? In the blank beside each word or phrase below, write

Y for "Yes" if it describes your work
N for "No" if it does not describe it
? for "?" if you cannot decide

__ Stimulating
__ Boring
__ Slow
__ Helpful
__ Stupid
__ Responsible
__ Likeable
__ Intelligent
__ Easy to make enemies
__ Rude
__ Smart
__ Lazy
__ Unpleasant
__ Supportive
__ Active
__ Narrow interests
__ Frustrating
__ Stubborn

Job in General

Think of your job in general. All in all, what is it like most of the time? In the blank beside each word or phrase below, write

Y for "Yes" if it describes your work
N for "No" if it does not describe it
? for "?" if you cannot decide

__ Pleasant
__ Bad
__ Great
__ Waste of time
__ Good
__ Undesirable
__ Worthwhile
__ Worse than most
__ Acceptable
__ Superior
__ Better than most
__ Disagreeable
__ Makes me content
__ Inadequate
__ Excellent
__ Rotten
__ Enjoyable
__ Poor

Work on Present Job

Think of the work you do at present. How well does each of the following words or phrases describe your work? In the blank beside each word or phrase below, write

Y for "Yes" if it describes your work
N for "No" if it does not describe it
? for "?" if you cannot decide

__ Fascinating
__ Routine
__ Satisfying
__ Boring
__ Good
__ Gives sense of accomplishment
__ Respected
__ Exciting
__ Rewarding
__ Useful
__ Challenging
__ Simple
__ Repetitive
__ Creative
__ Dull
__ Uninteresting
__ Can see results
__ Uses my abilities

Pay

Think of the pay you get now. How well does each of the following words or phrases describe your present pay? In the blank beside each word or phrase below, write

Y for "Yes" if it describes your work
N for "No" if it does not describe it
? for "?" if you cannot decide

__ Income adequate for normal expenses
__ Fair
__ Barely live on income
__ Bad
Comfortable
__ Less than I deserve
__ Well paid
__ Enough to live on

Opportunities for Promotion

Think of the opportunities for promotion that you have now. How well does each of the following words or phrases describe these? In the blank beside each word or phrase below, write

Y for "Yes" if it describes your work
N for "No" if it does not describe it
? for "?" if you cannot decide

__ Good opportunities for promotion
__ Opportunities somewhat limited
__ Promotion on ability
__ Dead-end job
__ Good chance for promotion
__ Very limited
__ Infrequent promotions
__ Regular promotions
__ Fairly good chance for promotion

Supervision

Think of the kind of supervision that you get on your job. How well does each of the following words or phrases describe this? In the blank beside each word or phrase below, write

Y for "Yes" if it describes your work
N for "No" if it does not describe it
? for "?" if you cannot decide

__ Supportive
__ Hard to please
__ Impolite
__ Praises good work
__ Tactful
__ Influential
__ Up-to-date
__ Unkind
__ Has favorites
__ Tells me where I stand
Annoying
__ Stubborn
__ Knows job well
__ Bad
__ Intelligent
__ Poor planner
__ Around when needed
__ Lazy

APPENDIX D

50-ITEM INTERNATIONAL PERSONALITY ITEM POOL (IPIP)

Rating	I….	Rating	I….
	1. Am the life of the party		26. Have little to say.
	2. Feel little concern for others.		27. Have a soft heart.
	3. Am always prepared.		28. Often forget to put things back in their proper place.
	4. Get stressed out easily.		29. Get upset easily.
	5. Have a rich vocabulary.		30. Do not have a good imagination.
	6. Don't talk a lot.		31. Talk to a lot of different people at parties.
	7. Am interested in people.		32. Am not really interested in others.
	8. Leave my belongings around.		33. Like order.
	9. Am relaxed most of the time.		34. Change my mood a lot.
	10. Have difficulty understanding abstract ideas.		35. Am quick to understand things.
	11. Feel comfortable around people.		36. Don't like to draw attention to myself.
	12. Insult people.		37. Take time out for others.
	13. Pay attention to details		38. Shirk my duties.
	14. Worry about things.		39. Have frequent mood swings.
	15. Have a vivid imagination.		40. Use difficult words.
	16. Keep in the background.		41. Don't mind being the center of attention.
	17. Sympathize with others' feelings.		42. Feel others' emotions.
	18. Make a mess of things.		43. Follow a schedule.
	19. Seldom feel blue.		44. Get irritated easily.
	20. Am not interested in abstract ideas.		45. Spend time reflecting on things.
	21. Start conversations.		46. Am quiet around strangers.
	22. Am not interested in other people's problems.		47. Make people feel at ease.
	23. Get chores done right away.		48. Am exacting in my work.
	24. Am easily disturbed.		49. Often feel blue.
	25. Have excellent ideas.		50. Am full of ideas.

APPENDIX E

SELF-EFFICACY QUESTIONNAIRE

Please answer the last three questions regarding the GED program

I feel confident that I have the discipline to study for the GED						
1	2	3	4	5	6	7

I feel confident that I can pass the GED test						
1	2	3	4	5	6	7

I feel confident in the methods used in the GED program						
1	2	3	4	5	6	7

APPENDIX F

ORGANIZATIONAL COMMITMENT QUESTIONNAIRE

The following statements concern how you feel about the **department** where you work. Please indicate the extent of your agreement or disagreement with each statement by **circling** a number from 1 to 7.

Strongly Disagree	Moderately Disagree	Disagree	Undecided	Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6	7

1. It would be very hard for me to leave my even if I wanted to department right now						
1	2	3	4	5	6	7

2. I do not feel any obligation to remain with my current employer						
1	2	3	4	5	6	7

3. I would be very happy to spend the rest of my career with this department						
1	2	3	4	5	6	7

4. One of the few negative consequences of leaving this department would be the scarcity of available alternatives						
1	2	3	4	5	6	7

5. Even if it were to my advantage I do not feel it would be right to leave my organization now						
1	2	3	4	5	6	7

6. I really feel as if this department's problems are my own						
1	2	3	4	5	6	7

7. Right now staying with my department is a matter of necessity as much as desire						
1	2	3	4	5	6	7

8. I do not feel a strong sense of "belonging" to my department						
1	2	3	4	5	6	7

9. I feel that I have too few options to consider leaving this department						
1	2	3	4	5	6	7

10. I do not feel "emotionally attached" to this department						
1	2	3	4	5	6	7

11. I would feel guilty if I left my organization now						
1	2	3	4	5	6	7

12. I do not feel like "part of the family" at my department						
1	2	3	4	5	6	7

13. This organization deserves my loyalty						
1	2	3	4	5	6	7

14. If I had not already put so much of myself I might consider working elsewhere into this department						
1	2	3	4	5	6	7

15. Would not leave my organization right now because I have a sense of obligation to the people in it						
1	2	3	4	5	6	7

16. This department has a great deal of personal meaning for me						
1	2	3	4	5	6	7

17. Too much of my life would be disrupted if I decided I wanted to leave my department now						
1	2	3	4	5	6	7

18. I owe a great deal to my organization						
1	2	3	4	5	6	7

APPENDIX G

POST TEST REACTION SURVEY

Circle One:

Did you learn the math on the
Website or in the Classroom

1. How would you rate the overall GED program?
   Put an "X" in the box next to the correct rating.

	Excellent
	Very Good
	Good
	Fair
	Poor

2. How much do you think this course will help you do better on the GED?

	It will help me a lot
	It will may or may not help me.
	It will not help very much

3. What were the major benefits you received? Check as many as you wish.

	Helped me understand new material
	Helped me practice material
	Helped me feel ready for the GED
	Helped me able to remember the material

4. If you use the website, how did you like it?
   Skip this question if you were in the classroom

	Excellent
	Very Good
	Good
	Fair
	Poor

Please use the space below to write any comments you would like to say about the website:

5. If you learned in the classroom, how did you like it?
   Skip this question if you used the website.

	Excellent
	Very Good
	Good
	Fair
	Poor

Please use the space below to write any comments you would like to say about the website:

What would have improved this program?

Would you attend future math classes done the way you just went through?
Put an "X" in the box next to your answer

☐ Yes

☐ No

VITA

Taryn Schrader was born at a Naval hospital in Portsmouth, VA to Stephen and LJ Schrader. She is the fourth of five children: Meghan, Amanda, Ryan, and Colleen. Taryn attended Bishop Sullivan Catholic High School. After graduation, Taryn went to Virginia Tech and graduated with a Bachelor of Science in Psychology in 2009. She went on to pursue her passion of Industrial-Organizational Psychology at the University of Tennessee at Chattanooga. She completed her degree in May 2015.