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Investigating Self-Directed Learning and Adult Learner Readiness Attributes in a Call Center Environment

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By

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Abstract

This study investigated the self-directed learning (SDL) attributes of call center employees and explored the impact of an adaptive learning intervention used within the corporate training program. In order to explore the perception of the learners, the self-rated scale of self-directed learner readiness (SRSSDLR) survey instrument was used to gather participant feedback (Williamson, 2008). Qualitative data was collected from the surveys, completion scores were gathered through the LMS system, and performance data focused on trainee proficiency on the job following training. Quantitative analysis was conducted using the Pearson Correlation Coefficient, and *t*-tests to determine relationship between the self-directed learning attributes and the outcome on the course completion scores, as well as each business efficiency metric.

Results revealed that the participants rated highly in the SDL measures scoring a mean of 235.5 out of a 300 total score, based on the SRSSDLR survey instrument. The majority of learners acknowledged the valuable impact of adaptive learning on their learning experiences. While the researcher initially anticipated lower SDL scores in the participant population, results revealed higher scores. Qualitative feedback revealed that 17% of the learners commented that the heavily scheduled and restrictive learning environment competed with their ability to direct their own learning to deepen knowledge acquisition. The mismatch between teaching technique and the student's stage for learning was evidenced in alignment with Grow's (1996) research on choosing the teaching techniques in alignment with the learner's needs. The theme of constant change competed with the learners' abilities to keep pace with all the changes while meeting performance demands on the job.

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Chapter One: Introduction

What we have to learn to do, we learn by doing.

Aristotle (349 B.C.E.)

Introduction

The world of work has been constantly under pressure to change and find innovative ways to help employees succeed in their jobs. As technology and increasing change continued, as reflected in this quote from Gelsinger (2018), CEO of Intel Corporation, recognized that the pace of change continued to accelerate:

> It may feel like the pace of technology disruption and change these days is so dizzying that it could not possibly get any more intense. Yet here's the science fact: the pace of change right now is the absolute slowest it will be for the rest of your life. Fasten your seatbelts. It's going to be a fascinating ride. (p. 7)

Charungkaittkul and Henschke (2018) recognized that companies all around the world were discovering the need for better strategies to reinforce continued learning to support the change from an industrial learning society to a society focused on knowledge acquisition. As the pace of change continued to accelerate, the importance for companies to focus on andragogy also increased to meet the learning needs of adults in public education and private organizations worldwide. Focusing on creating effective training programs for adults became a critical lever for success. The impact of accelerated change directly influenced the world of training within corporations as managers and training professionals worked to decipher the best ways to support continual learning within their organizations (Andriotis, 2021; Bernard, 2018; Lynch, 2019).

Background of the Study

As corporations strove to provide the best training experiences for employees, an increasing number of Learning and Development (L&D) professionals were focused on better understanding learner preferences, learner experiences, and the learning environment to create a comprehensive learning experience (Bersin, 2017). Scholars' focus on the impact of adaptive learning techniques contributed new observations, such as Colchester et al.'s (2017) exploration of how adaptive learning techniques and systems were used to meet the changing needs of learners who required increasing flexibility to survive a rapidly changing world. Given the constant acceleration of change, corporate training environments, as well as educational environments were driven to find adaptive and self-directed solutions to meet learners' changing needs (Anderson, 2019). Cyril Houle (1961) studied adult learners at the University of Chicago. Houle's (1961) initial work, *The Inquiring Mind* led him to explore the attributes of adult learners and to understand the motivations of adult learners who desire to know and who value continued learning (Brockett & Donaghy, 2005). Two of Houle's (1961) students later added to the scholarly work focused on adult learning and specifically, self-directed learning. Both Malcolm Knowles in (1975) and Allen Tough in (1979) contributed to the definitions of learning concepts and the characteristics of adult learners described as andragogy, which included descriptions about the attributes of self-directed learning.

Henschke et al. (2016a) found that multiple universities across the globe observed rapid change, which drove learning organizations to embrace enhanced andragogy and self-directed learning approaches in order to keep pace with constant change. Cadorin et al. (2017), Shen (2014), and Williamson and Seewoodhary (2017) also noted the

increased realization that due to accelerating and changing needs within education and business environments, new learning strategies specific to self-direction were needed to support students throughout their studies and careers. The study focused on a corporate training environment that implemented adaptive learning techniques and focused on the development of self-directed learning attributes in order to enhance employees' learning. This chapter describes the background and rationale for the study, outlines the research questions and hypotheses, provides an overview of the limitations, and defines the terminology used throughout the research.

Theoretical Framework

There are three major contributions in the field of adult learning discussed in this research, which included adaptive learning strategies, the theory and definition of andragogy, and self-directed learner readiness attributes, as well as several SDL survey instruments used to collect student feedback regarding their perceptions of learner readiness. Adaptive learning techniques explored the notion of adjusting the learning activities in a customized approach for each individual learner by using both adaptive technology and flexible training techniques to maximize and meet learners' specific needs (Capuano & Caballe, 2020; Cavanaugh et al., 2020; Morris, 2019; Wang et. al., 2014; Yang et. al, 2013).

Knowles (1975) was one of the prominent leaders of adult learning and was credited with defining the term and describing multiple learner assumptions that characterized andragogy in practice (Knowles, et al. 2005). As educators continued to investigate effective learning theories and solutions, additional scholars uncovered expanded insights to guide adult learning concepts and strategies (Candy, 1991;

Henschke, 2011, 2016, 2017; Houle, 1961; Merriam, 2017). Self-directed learning (SDL) attributes (Caffarella, 1993; Grow, 1991; Knowles, 1985, 2005; Williamson 2007) and learning readiness scales were identified, created, and expanded by multiple scholars over the last 40 years (Guglielmino, 2008; Shen et al., 2014; Williamson & Seewoodhary, 2017). The growing influence of these learning theories, adaptive frameworks, and learner attributes are discussed in detail in this research.

Statement of the Problem

While the research on self-directed learning (SDL) has been evolving over the last 100 years, there is little research focused on SDL for call center employees. Research on self-rated, SDL suggested that adults could learn to be more self-directed in their learning and possess the ability to continually learn and develop their skills (Guglielmino, 2013; Williamson, 2007). Williamson's findings were specifically relevant in workplace learning as employees were being constantly asked to improve their skills and to respond to increased skill and knowledge development throughout their careers.

Murray and Peréz (2015) stated that Adaptive Learning was considered as a potential game-changer in education, a training approach that would solve the riddle of the iron triangle: quality, cost, and access to learning. In order to strive to create high quality learning programs and lasting impact of learning solutions, adaptive learning techniques and strategies were key to advancing the effectiveness of training programs within the work context (Murray & Perez, 2015). Regardless of systems or specific tools, the pendulum in learning designs has swung toward adaptive, personalized learning in order to accelerate learners (also known as employees) toward rapid productivity (Murray & Peréz, 2015).

Corporate and educational communities discussed the practicality and efficacy of the adaptive training techniques and approaches. This added focus benefited both the specific call center training department and the scholarly community with data and research in the area of adaptive learning (Yang et al., 2013). As discussion continued within corporations and educational communities about the practicality and efficacy of adaptive training approaches, testing of the two adaptive learning approaches provided an additional focus that benefited both the specific call center training department and the scholarly community with data and research in the area of adaptive learning (Yang et al., 2013).

Purpose of the Study

The purpose of this research was to discover if learners in a call-center environment demonstrated SDL attitudes and attributes using the following five categories: awareness, learning strategies, learning activities, evaluation, and interpersonal skills. These SDL attributes are associated with successful, self-directed learners (Williamson, 2007). The goal of this study was to investigate if the call center employees demonstrated any characteristics in relation to SDL and to determine if correlations exist between the SDL characteristics and the employees' business efficiency scores. Additionally, the research investigated whether adaptive training practices enhanced SDL effectiveness and the employees' ability to apply their knowledge in work-related tasks. As Grow (1996) discussed in his work on training adult learners, a mismatch between readiness and training techniques could leave the learner overwhelmed and unprepared. Gathering this data provided a better understanding of the call center employees' learning needs to make more effective decisions about future

training interventions. This study investigated the following three research questions and five hypotheses about self-directed learner readiness and adaptive learning techniques used within a corporate training environment for call center employees.

Research Questions and Hypotheses

The following research questions and hypotheses guided the study:

Research Question 1: What self-directed learner readiness attributes were evident in the call center population?

Research Question 2: To what extent did the adaptive training intervention impact learner outcomes?

Research Question 3: To what extent did learner readiness impact the employee's ability to apply their new knowledge on the job?

Alternate Hypothesis 1: There was a difference between the Self-Rated Survey Self-Directed Learning (SRSSDL) readiness score and the adaptive training approach.

Alternate Hypothesis 2: There was a relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and course final test scores.

Alternate Hypothesis 3: There was a relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and Average Handle Time (AHT) scores.

Alternate Hypothesis 4: There was a relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Repeat Call-Back (RCB) scores.

Alternate Hypothesis 5: There was a relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Branch View Scores (BVS).

The five hypotheses proposed that specific self-directed learner attributes were evident in the survey results and that the secondary data showed a difference between higher self-directed learner attributes and higher test scores. The data from the surveys, the test scores, and the three business efficiency metrics captured by the company to monitor performance was used to investigate how the variables impacted employee learning in an SDL context. Focusing on these questions investigated the subject of learner readiness, which had been frequently unexplored in business training environments.

Significance of the Study

While research on SDL attributes for learners within education and business environments provided many sources and scholarly contributions over the last 40 years, little research was found focused specifically on call center employees. This study was focused specifically on the call center environment and addressed three unique aspects that impacted the employees' ability to learn. As training executives strove to find the right combination of levers to apply within their business environments, the ability to benchmark best practices was limited by the sparse scholarly research available. The researcher found six unique business and scholarly articles related to call center training in a review of 250 scholarly articles over the last 15 years. The research and findings of the study provided an opportunity for training professionals to consider the implication of leveraging adaptive learning strategies (Howe, 2018; Pugliese, 2016) paired with andragogical principles (Henschke, 2016b), and targeted development of self-directed learner attributes (Raemdonck et al., 2017) to increase the effectiveness of adult learning

experiences and to accelerate learning efficacy throughout an employee's career journey (LaDue et al., 2018; Lemmetty et al., 2020).

Definitions of Key Terms

For the purposes of this study, the following terms are defined:

Adaptive Learning. Learning strategies that adapt to the learner responses to increase learning effectiveness through specific remediation tailored to the learner (Murray & Pérez, 2015).

Adaptive Learning Systems. An electronic system that leverages branching techniques and artificial intelligence to respond to learners' answers to provide personalized interaction (Yang et al., 2013).

Andragogy. An approach to adult learning that consists of six characteristics for adult learners related to their experiences and self-direction in contrast to how children (pedagogy) learn (Knowles, 1975).

Bloom's Taxonomy. A set of four hierarchical models used to classify educational learning objectives into levels of complexity and specificity. The models were named after Benjamin Bloom, who chaired the committee of educators that devised the taxonomy (Bloom, 1984).

Bricolage. French term used to describe the ability to construct something new from a diverse range of resources or ideas (Siefert et al., 2016).

Business Efficiency Metrics. A specific behavioral measure used within a call center to track employee performance in handling service calls. In this study, specific analysis includes these three call center measures: Average Handle Time (AHT), Repeat Call Backs (RCB), and Branch View Score (BVS; Bergevin, et al., 2010).

Cognitive Domains. Domains of thinking that are specific to the learning and understanding of knowledge (Bloom, 1984).

Cognitive Overload. A situation where the teacher gives too much information or too many tasks to learners simultaneously, resulting in the learner being unable to process this information (Sweller, 1988).

Constructivism. A learning theory that states that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. This educational theory was heavily referenced by the early learning researchers and learning psychologists, such as Piaget, Dewey, and Vygotsky (Chu, 2017).

Instructional Scaffolding. A process through which a teacher adds support for students in order to enhance learning and aid in the mastery of tasks. The teacher does this by systematically building on students' experiences and knowledge as they are learning new skills (Bruner, 1960; Vygotsky, 1987).

Iron Triangle. A project management term related to scope, schedule, and resources (or costs) associated with the program and managing all three aspects simultaneously (Murray & Peréz, 2015).

Learner Readiness. The combination of ability and motivation, ranging from 'not able' and 'not willing or motivated' to do the specific task, to 'able and willing' to do the task. Readiness to learn is situational and it may even be task specific (Grow, 1996).

Meta Schema. In psychology and cognitive science, describes a pattern of thought or behavior that organizes categories of information and the relationships among

them. Examples of schemata include academic rubrics, social schemas, stereotypes, social roles, scripts, worldviews, and archetypes (Reams, 2017).

Reflexivity. A researcher's background and position will affect what they choose to investigate, the angle of investigation, the methods judged most adequate for the purpose, the findings considered most appropriate, and the framing and communication of conclusions (Malterud, 2001).

Schemata. Plural of schema. According to Piaget's theory of development, children (and adults) construct a series of frameworks, or schemata, based on the interactions they experience, to help them understand the world (McLeod, 2012).

Self-Directed Learner Characteristics. A personal attribute; the desire to know, learn, and grow with attributes that include goal-oriented, activity-oriented, and learning-oriented behaviors. Defined by multiple scholars, including Grow (1996), Guglielmino (1978), Houle, (1961), Tough (1967), and Williamson (2007).

Self-Directed Learning. The definition of SDL describes a process in which the individual learner takes the initiative, with or without the help of others, in diagnosing their learning needs, formulating goals, identifying human and material resources for learning, choosing, and implementing appropriate learning strategies and evaluating learning outcomes (Knowles, 1984).

Self-Rated Self-Directed Learner Readiness (SRSSDL). A survey tool for learners to identify their perceptions, behaviors, and skills related to their level of self-directed learner readiness (Williamson, 2007).

Limitations

The scope of the study included the following limitations: The study was conducted by sending email distributed surveys to a group of employees working in a corporate service-training site at a large financial firm in the Midwest in February 2020, following the completion of the training program. The training program was offered multiple times throughout 2018 and the surveys were sent to employees in February 2020, after all participants had completed the training program within the service division. In order to study the impact of self-directed learner attributes and the impact of strategies to enhance learner performance, an ideal approach, would include pre- and post-surveys in order to compare learner behaviors (Creswell & Creswell, 2018). However, due to strict compliance rules governing the corporate service training department, within a private financial firm, only post surveys were used to capture participant learner data. This limitation provided participant self-reported perceptions, but lacked the ability to compare behavior before training and after training to assess a detailed review of the impact from the training intervention.

As the characteristics of the learners, who were part of SDL intervention were not well understood, the purposive sample of participants from this recent program provided an opportunity to explore the impact of the new training approach. The participants were selected from a convenience sample and were chosen for this study in order to investigate if there was a connection between learner characteristics and adaptive training techniques for this specific group of employees (Fraenkel et.al., 2015, p. 101).

The sample population included employees within a specific training department within the Service Division of a corporate training organization. The four demographic

categories included level of education achieved (High School, Associate Degree, Trade School, Undergraduate Degree, Master's Degree and Doctorate Degree) and years of experience in a service, call-center role (1 year or less, 1-3 years, 4-9 years, and 10+ years of experience), which was captured from the survey data. The criteria for the participants to be included within the study included only the learners who had participated in the SDL program, which included two adaptive learning interventions.

The survey instrument used in the study was adapted from Williamson's (2007) survey, the Self-Rated Scale for Self-Directed Learner Readiness Survey (SRSSDLRS). The length of the survey was a limitation to completion, since the survey included 65 Likert-style questions divided into five groupings, based on the learner attributes exhibited by self-directed learners.

Summary

Business leaders in corporate training environments have searched for proven best practices to accelerate and enhance employees' abilities to learn faster and most effectively (De Geus, 1997). Training professionals and business leaders explored adaptive learning strategies (Dziuban et al., 2018) and implemented various learning interventions to develop SDL attributes in order to sustain more durable learning skills in their employees over their career lifecycle (Cohen, 2017). Training professionals and educational leaders observed that using specific andragogical principles to meet the needs of adult learners increased learning efficacy (Alping & Parcasio, 2018; Charungkaittkul & Henschke, 2018).

The researcher strove to reveal best practices to support accelerated learning, using adaptive strategies that built upon sound andragogical learning principles and

develop SDL to strengthen employees' life-long learning skills. Using mixed methods research methodology, the purpose of the study was to analyze the effectiveness of the adaptive training, the existence of five specific, self-directed learner attributes (attribute categories include: awareness, learning strategies, learning activities, evaluation, and interpersonal skills) and the impact of these factors on learner success within a call center training environment.

This chapter outlined the background, purpose, and rationale for the study and presented the three research questions and five hypotheses used in the mixed methods research approach used. The theoretical framework was stated, various limitations were identified, and the definitions used within the study were described. Chapter Two reviewed the current literature focused on exploring the andragogical principles, self-directed learner attributes, and adaptive learning strategies found in historical and current scholarly and business literature.

Chapter Two – Review of Literature

The impact of accelerated change directly influenced the world of training within corporations, as managers and training professionals worked to decipher the best ways to support continual learning within their organizations. The literature review focused on several aspects of adult learning theory that had the ability to influence successful learning in an age of ever-increasing change. First, adaptive learning including a brief focus on adaptive learning systems, as well as a learning technique and adaptive strategy was investigated. Second, Andragogy and Knowles' (1975) definition and connections to adult learner efficacy were explored. Next, the discussion focused on the definitions and influence of SDL on the modern learner. Finally, a summary of the self-directed rating scales used to determine learner readiness attributes were identified and explored. The theoretical reasons for inclusion of these three educational themes were to connect the latest educational theories to the applied research observed in this study.

The common theme emerging throughout the literature was multi-faceted. Science, technology, medicine, education, and various business environments acknowledged that access to information globally was creating an increasing demand upon modern learners. Self-directed learning has become more useful in multiple industries, such as the medical field, due to the business need for learners to pursue continuous improvement to keep up with the rapid pace of change and innovation, and information technology (Aljafari, 2019). The prior notion of adults completing their education left many of these learners unprepared for the reality of an employment environment that was more dynamic and in a state of perpetual change. Regardless of industry or educational context, adult learners needed support in building self-directed skills. No longer were college and education a

one-and-done event that would sustain an employee throughout a career. The skills needed to advance and include the ability to build upon knowledge and the ability to continue growing skills and knowledge situationally and persistently (Aljafari, 2019). These self-directed skills were perceived, now more than ever, in professional and business environments. The knowledge-worker in an office had skills that became obsolete within a few years (Bersin, 2017). The medical doctors, nurses, and scientists in multiple fields (Williamson, 2007) required a consistent upgrade to their own knowledge and expertise, as technology and innovation changed medical procedures and diagnoses. Because of the rapidly evolving nature of innovation and technology in the professional environment and the need for employees to continually update their knowledge, SDL was crucial for professionals to embrace, as a strategy to prepare themselves for constant change (Deloitte, 2017).

As corporations continually searched for progressive ways to enhance the learning of their employees and their ability to perform in their jobs, increasing interest in andragogy, and self-directed learner readiness, as applied to workplace environments, became evident in the literature, as well (Bersin, 2017; Brandon Hall, 2018). Companies all over the globe in the Medical, Scientific, Pharmaceutical, and Nursing environments began increasingly studying SDL, as a means to increase their employees' learning efficiency, as well as a means to continue their knowledge beyond the classroom and throughout their careers (Shen et al., 2014; Williamson, 2007, Williamson & Seewoodhary, 2017). "Lifelong learning," "continuous learning," and "learning organizations," (Senge, 1990) and related terms, such as organizational learning, became more evident as these organizations saw better learning results when the employees can

embrace SDL (Henschke, 2016b) and strive to extend their own knowledge on a continual basis.

Human resource professionals strove to find the most effective and impactful training approaches to support skill development needs within the corporate environment. Companies spent significant funds to create resources and curriculum. However, these professionals frequently found that employees were successful and promotable through their own self-directed efforts to learn and improve (Bernard, 2018). The choice to embrace new technologies that increased speed to learning and thereby productivity, pushed companies to strive to find the right mix of tools and techniques to give their firms the best advantage. When systems or learning design specifically targeted remediation and responded to the learners' needs in specific ways, their learning accelerated (Antonsen et al., 2010; Howe, 2018; Lynch, 2019).

Though more corporate training environments are focusing on SDL, little research has been conducted in a service-center or call-center environment. The goal of this literature review was focused on revealing relevant and common learner readiness attributes that are applicable across industries. The purpose of the research study investigated whether employees in a contact center department of a large financial firm exhibited SDL attributes. As Guglielmino (2001; 2013), discovered in research of multiple training environments, the presence of higher SDL attributes in a learner population positively influenced the learning achieved. The theories behind andragogy and determining specific adult learning needs, as defined by Knowles' (1975) enhanced the efficacy of a training program when the characteristics, conditions, and the motivations of adult learners are considered (Henschke 2016; Knowles, 1975; Merriam,

2017; Williamson, 2017). The study further investigated the impact of adaptive learning interventions and the influence of the flexible application of training activities to enhance learning within the workplace environment. Business efficiency metrics were used to measure whether the adaptive training had a positive impact on the participants' abilities to apply their new skills on the job.

Since these aspects of adult learning were present in the contact center environment, the goal of this literature review was to examine the theories and field experiences of multiple scholars and to correlate the common themes in current workplace environments. as much has been written about SDL, andragogy, and adaptive learning techniques in the educational and school environments during the 1970s through 1990s (Ma, 2017) technology innovation and accelerating change drove the continual need for educators in the school environment, as well as in the workplace environment to investigate improvements to learning strategies, in order to keep up with the demand of the modern learner (Howe, 2018; Lynch, 2019).

Theoretical Framework

Major contributions in the field of adult learning included adaptive learning strategies, the theory of andragogy, and self-directed learner readiness attributes, as well as several SDL survey instruments used to collect student feedback regarding their perceptions of learner readiness. Adaptive learning techniques explored the notion of adjusting the learning activities in a customized approach for each individual learner, using both adaptive technology and flexible training techniques to maximize and meet learners' specific needs (Capuano & Caballe, 2020; Cavanaugh, et al., 2020; Morris, 2019; Wang et. al., 2015; Yang et al., 2013). Knowles (1975) was one of the predominant

leaders of thought regarding adult learning and was credited with defining the term and describing multiple learner assumptions that describe andragogy in practice (Knowles et al., 2005). The growing influence of these learning theories, adaptive frameworks, and learner attributes are discussed in detail in this literature review.

Adaptive Learning

Adaptive Learning has the potential to cause a major shift in the world of corporate learning. Previously companies struggled to find effective ways to customize training to maximize participants' learning and to do so in an affordable and streamlined manner. As technology has continued to advance over the last 10 years, more adaptive systems have become available to educational institutions and workplace learning environments (Brandon Hall Group [BHG], 2018). The promise of Adaptive Learning Strategies and Adaptive Learning Systems excited companies because systems had finally come online and became more readily available, so that many companies were aligned with learners' needs in a dynamic way and used more progressive and adaptive technology to achieve their learning goals (BHG, 2018). Various companies began to reap the benefits of aligned systems that automated remediation and responses to learners. These new adaptive systems were programmed with specific instructional strategies to enhance learning and accelerate learning effectiveness on the job (Bersin, 2017). Learning technologies and articles about the newest trends in learning advances bombarded the learning professional (Bersin, 2017). In an effort to find the solutions that truly made a difference to adult learners within corporations, training professionals needed to decipher the techniques that impacted learning effectively and made a difference to the company’s business. With the rise of educational tools run by artificial

intelligence, adaptive learning systems became more effective. Additionally, with the inclusion of tailored and adaptive learning strategies, the entire learning ecosystem became more effective in personalizing learning (Bersin, 2017; Bower, 2016).

Defining Adaptive Learning Systems and Strategies

Adaptive Learning Systems were described as a learning tool or system, even a learning management system which could be a computerized or a virtual system that could change and provide feedback to the participants' responses. These features enabled customization of the learning, as each response was tailored to the answers given by each unique learner (Peng et al., 2019). Adaptive learning systems were designed to dynamically adjust to the level or type of course content, based on the individual student's abilities or skill attainment, in ways that accelerate a learner's performance with both automated and instructor interventions (Pugliese, 2016). Adaptive Learning was defined as both a digital system that collected information about the learner through assessment, analyzing that information to adapt and offer individualized learning paths back to the learner, as well as an instructional process and andragogical practice to provide personalized learning (Cavanaugh et al., 2020). The adaptive design framework designed by University of Central Florida (UCF) specifically for a nursing training program, included five key elements: objective-based learning bits, personalized assessment and content, adaptive learning path, alternative content, and procedurally generated questions. The results of this adaptive framework enabled the instructors to provide a suitable, branched learning experience that provided personalized learning for students (Cavanaugh et al., 2020).

Comparatively, Adaptive Learning Strategies were aligned more closely with instructional design methodologies and addressed the techniques used to enhance and customize learning. Whether a system or an instructional technique, adaptive learning offered the opportunity to adjust learning for the student in a flexible and tailored approach (Cavanaugh, et al. 2020). Adaptive learning design, as defined by Bower (2016) described the approach where learning was optimized by adjusting the learning during training, to clarify when concepts are understood or misunderstood. "Adaptive learning design is a process whereby educators strategically modify a learning design during lessons in order to meet the emerging requirements of learners" (Bower, 2016, p. 11). Adaptive learning interventions provided more effective knowledge and interaction to support deeper, more robust transfer of knowledge and skill by adjusting the training to meet the specific needs of the learner (Bower, 2016).

Additionally, the blending of both adaptive learning systems and adaptive learning strategies leveraged the latest thinking in cognitive processes such as cognitive load theory and metacognition, which leveraged techniques on how the brain learns and uses new and inventive ways to create personalization for the learners (Antonsen et al., 2010). This kept the learning more engaging and more readily applicable to the work environment. Research conducted at an international financial institution in Norway reviewed the impact of adaptive learning in the workplace. Antonsen et al. (2010) suggested that adaptive learning lessens cognitive uncertainty and this type of uncertainty drove critical thinking. Employers desired and valued critical thinking and problem-solving. Leveraging an adaptive learning system or adaptive learning strategy enhanced

critical thinking in employees and was highly desired by many companies (Antonsen et al., 2010).

As Kelly's (2008) research about Adaptive versus Learner Control from the National College of Ireland pointed out, there was a strong correlation in the need for adaptive learning strategies to be deployed for today's modern learning. The research also showed Gardner's theory of multiple intelligences influenced how a learner uses different kinds of 'intelligence' to activate their own learning (Kelly, 2008). Adaptive learning strategies needed to address the dynamic nature of a learner's experience. The eight different intelligences included the following: logical/mathematical, linguistic/verbal, visual/spatial, bodily/kinesthetic, musical/rhythmic, interpersonal, intrapersonal, and naturalistic intelligence (Gardner, 2000). These intelligences were of significance in the corporate training context, where not only the learning of content was a goal, but to use that newly learned knowledge or skill an employee was expected to apply, value, and build their learning (Gardner, 2000). As employees applied their learning, the expectation of increasing performance and readiness to synthesize their new knowledge and create more ways to improve their knowledge was greatly enhanced when the adaptive learning strategies used in the overall training and adaptive learning systems were all aligned to take advantage of the employee's multiple intelligences. The more opportunities the learning strategies used to reinforce more areas of learning, the greater the effectiveness of the overall program for the participants involved in the training effort (Kelly, 2008).

Murthy et al. (2008) studied the effect of simulation training on call center employees at two different companies. The on-the-job metrics the companies focused

upon for their call center effectiveness measures included accuracy in the calls and call duration. The simulations included observation, practice, and feedback. Role playing to provide behavior modeling was included in the simulations, just as it would in face-to-face training at the call centers. Statistical analyses were carefully applied and after controlling for the factors, such as the employee's learning and technology orientation, age, experience, and call center experience, the results of the study revealed that the simulation training outperformed role-playing based training in both accuracy and speed of processing customer calls. Additional insight shared that simulation training improves at higher levels of task complexity. The results suggested a significant benefit to using the simulated approach to increase effectiveness and employee performance back on the job. While Murthy focused on the impact of adaptable simulation training, Gans et al. (2010) explored how call center agents learned by monitoring their call handling times by using advanced statistical modeling of performance data. The trends revealed three learning curves for the group of employees who participated in this study. As mentioned by Gans et al. (2010, p. 115), three parametric models and one non-parametric model were used to capture the learning effects of the agents. Three learning patterns were revealed about the agents within the call center. The first case, called The Optimistic Case, found that the call agents always learned. The second case, called the Pessimistic Case, showed that some of the call center agents never learned. And the third case, called the Common Case, demonstrated that the agents may learn, as well as forget. Gans et al. (2010) data provided insightful trends about call agent learning that influenced future decisions regarding simulation training.

Adaptive Learning Systems

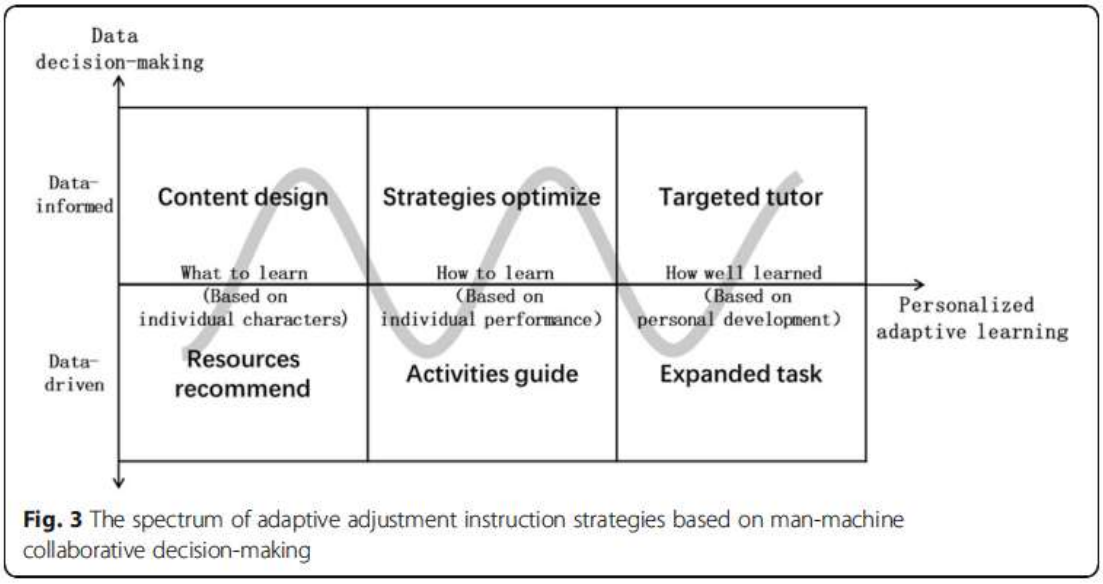
Murray and Peréz (2015) stated that Adaptive Learning (ALS) was considered as a potential paradigm-shift in education. It was called a training approach that would solve the riddle of the iron triangle: quality, cost, and access to learning. In order to create high quality learning programs and lasting impact of learning solutions, adaptive learning techniques and strategies were key to advancing the effectiveness of training programs within the work context. Regardless of systems or specific tools, the pendulum in learning designs has swung toward adaptive, personalized learning to accelerate learners (also known as employees) to rapid productivity (Yang et al., 2013). As discussion continued within corporations and within educational communities about the practicality and efficacy of adaptive training approaches, testing these adaptive learning approaches provided an additional focus that would benefit both the specific call center training department and the scholarly community with data and research in the area of adaptive learning (Yang et al., 2013).

Smart learning environments enabled technologies to capture individual student progress and provided personalized recommendations to enhance and adjust to individual learning needs (Peng et al., 2019). The personalized adaptive methods promoted educational opportunities that focused on the content needs, instructional strategies, and tutoring techniques to provide specific and actionable methods to bring the learner's knowledge from the bottom of Bloom's (1984) taxonomy (recall and understanding). These techniques and methods used personalized activities and suggested actions to guide learning to application and critical thinking on the evaluation of Bloom's taxonomy (Peng et al., 2019). As shown in Figure 1, Peng et al. (2019) described the

interconnection between three instructional strategies used to maximize learning provided in an adaptive learning approach, including: content design, strategies to optimize learning, and targeted tutoring. Structuring the learning experience to include targeted learning adaptation provided an effective and personalized experience to support the learner throughout the training experience.

Figure 1

The Spectrum of Adaptive Adjustment Instruction Strategies



Note. From Peng et al.'s (2019, p. 235), "Personalized adaptive learning: An emerging pedagogical approach enabled by a smart learning environment." Reprinted with permission.

Personalized learning within the adaptive learning construct, using adaptive learning systems allowed the system to customize learning plans for the students, which enabled the instructors to focus on course design specifics and reduced the workload for design while optimizing learning for every learner, which was harder for an instructor to scale (Lin et al., 2021). Both Lin et al. (2021) and Peng et al. (2019) observed that

adaptive systems increased the effectiveness of the instructional strategy and provided personalized instruction, which could be scaled to a larger and more distributed student population. In a similar research study, an adaptive learning system called “ProTus,” a programming tutoring system had results that indicated highly motivated and self-regulated learners were more likely to use the e-learning system, such as ProTus. The open-learner model provided useful insight for self-directed learners to use to adjust their own strategies to learn more effectively. Adaptive Learning Systems supported self-directed learner readiness by promoting reflective thinking, providing specific feedback, and adapting learning strategies to enhance the overall learning experience for participants (Vesin et al., 2018).

Research from additional systems, such as the Diogene platform and the IntraServ evaluation, demonstrated that customized curriculum and adaptive learning strategies that aligned to cognitive science and enabled repetition and assignment to long term memory were impactful to learners’ experiences and ability to apply knowledge most effectively to their work using these training systems was observed (Sangineto et al., 2007). Using an iterative process in the adaptive learning architecture, the Diogene platform provided tailored content served to learners. Tailored content was created using targeted concepts developed by automatic course generation, based on the learning path the employee chose (or was placed into by their manager), based on their prior knowledge and experience. This approach to adaptive learning was highly effective in reducing the amount of content the learner needed to review to focus on content already mastered (Sangineto et.al., 2007).

Using methodology known as the Systemic Structural Theory of Activity (SSTA), von Brevern and Synytsya (2006) found that call center employees were able to observe the interdependent aspects of cognitive and social impacts to the learning the employees participated in completing. The application of these methods enhanced and created an adaptive learning scenario that accelerated the employees' learning and effectiveness back on the job (von Brevern & Synytsya, 2006). Acceleration of learning was consistently desired by training managers. Kara and Sevin (2013) explored the use of Adaptive Learning Systems compared to what had previously been known as 'Teaching Machines,' as referenced by 'Pressley's Machine,' from 1965. This was the first developer of systems that included stimulus materials and response and reinforcement activities that engaged the learners in the training program (Kara et al., 2013). Their research observed that Adaptive Learning Systems could not be as effective nor as efficient without including sound instructional design.

Another compelling model created by Wang, et al. (2015) from the Griffith University in Australia, demonstrated the holistic nature of the learning system and the interaction between the learners and the overall environment where the training was implemented. In their CABLS framework, known as the Complex Adaptive Blended Learning System, the team found that the six dimensions of the framework displayed the most effective order to enable learners to be more effective learning participants (Wang et al., 2015). The model addressed multiple aspects of learning strategies that influenced a learner in a corporate training environment such as: the teacher fulfilled multiple roles including moderator, facilitator, and guide to support the training. The learner had multiple roles to fulfill, such as collaborator, learner, and researcher. The content within

the system included five methods, such as interactive learning, individualized learning, deeper learning, problem based learning, and collaborative learning. Each dimension was supported by technology that delivered the training through four modalities, defined as synchronous, asynchronous, offline, and online types of training (Wang et al., 2015).

This CABLS model was exceptional in the demonstration of the systematic and holistic nature of learning and the interdependencies that connected the variety of domains and related subsystems. The overall impact also illustrated clearly that learning was not a linear event, as previously thought. Adaptive Learning was indeed holistic and influenced by a variety of variables, thereby influencing learners who also co-evolved as they interacted with each of the subsystems in their endeavor to learn (Wang et al., 2015). This model was especially useful in complex corporate environments where the performance of the learners (workers) was influenced and supported by all these multiple systems and groups within the larger corporate environment.

The research on Adaptive Learning revealed trends that reflected dynamic progress through technology and responsive systems to an increased focus on cognitive science to support the development of personalized and adaptive learning systems. Adaptive Learning Strategies evolved to support the blended and personalized approaches to learning (Wang et al., 2015) that many corporations required to enable employees to respond to the needs of an ever-changing work landscape, as explained by Posner (2018), concerning this dynamic in his article about personalizing Adaptive Learning platforms.

These systems have been heralded as the future of corporate training. The four techniques that make the adaptive learning strategies so effective include:

> reinforcement of long-term memory, personalization of the content to close skill gaps and knowledge gaps, increasing confidence and using game style remediation to keep the learners engaged. (Posner, 2018, p. 26)

By using metacognitive theory to assist the learners in understanding what they did and needed to do, and creating opportunities for deliberate practice, both strategies contributed to superior learning and faster application in job performance (Posner, 2018).

Adaptive learning provided alternative strategies to personalize and adapt to learners' needs. Students learned and stretched more to build additional skills when provided a learning approach/style that is outside their natural preference. As the global economy continued to evolve to a knowledge society, in order to develop 21st century skills, universities around the world were focused on finding new ways to create learning programs that developed skills, increased learning through adaptive training strategies, and supported students to embrace life-long learning skills (Lauwers, 2019). Teachers increased deeper skills through the use of adaptive learning techniques and a variety of remedial and adaptive learning systems (Lauwers, 2019). The next year, Walzer (2020) found that use of technology used within a music technology course for adult learners increased when andragogical principles, such as encouraging self-paced learning, providing adequate time for task completion, providing differentiated instruction when needed, and accounting for lifelong learner motivation, all contributed to the learner's successful completion of the course. Statistically significant results were observed in using andragogical teaching methods with adult learners (Walzer, 2020).

Adaptive learning aligned with SDL strategies as learners were able to determine the pace and time needed in order to master topics. The flexibility provided by adaptive

strategies allowed for learners to choose their own progress through the material. For example, a student may extend completing the material across a semester, for example, or finish the materials at their own faster or slower pace (Dziuban et al., 2018). Through several studies on adaptive learning programs at Arizona State University, Colorado Technical University, and Georgia State University researchers found the benefit of adaptive and blended learning programs successfully influenced learner outcomes across multiple math classes and specifically for at-risk students. These students, through the process of receiving more precise feedback, were able to perform better overall in math classes, showing between 66% to 94% improvement, compared to other nonadaptive courses (Dziuban et al., 2018). Additional research on adaptive training systems conducted by Yarnall et al. (2016) found statistically significant improvement in the math skills specifically evidenced in overcoming knowledge gaps through remediation provided in the adaptive learning program. Research focused on learners' perceptions of the value of adaptive learning, found that the ability to get feedback on learning strengths and weaknesses was highly valued and useful to student learning success (Simon-Campbell & Phelan, 2016).

Adaptive learning techniques provided the personalization and the ability to present information to the learner in a more digestible and engaging way (Capuano & Caballe, 2020; Liu et al., 2017). Research studies repeatedly reported findings that learner's individual needs were met through adaptive learning solutions (Kerr, 2016; Liu et al., 2017; Yarnall et al., 2016). Adaptive learning further provided enhanced problem-solving skill development (Kong et al., 2014; Liu et al., 2017) and accelerated learning achievement when matched to the student's cognitive learning preferences (Liu et al.,

2017; Yang et al., 2014). Adaptive learning systems provided personalized learning that supported learner engagement to maximize successful learning and application (Capuano & Caballe, 2020). Adaptive learning supported learning by providing a variety of learner experiences, and cognitive backgrounds, and learning preferences, which was most often seen in vocational or workplace learning environments (Capuano & Caballe, 2020).

As colleges and universities sought to meet the needs of more diverse students, such as adult learners returning to college, or online learners returning to re-learn new skills, the needs of the students were shifting from a traditional curriculum to an adaptive learning environment. (Yarnall et al., 2016). Ideal opportunities to provide flexible and adaptable learning courses or curriculum provide a robust opportunity for personalized instruction for each learner (Colchester et al., 2017; Educause Learning Initiative, 2017). The benefit of an adaptive learning system also provided personalized training at scale, by systematically responding to the needs of each learner. Further investigation revealed that disadvantaged students increased in skills, in line with overall achievement norms, increasing learning success overall (Yarnall et al., 2016).

In a groundbreaking study in Germany on adaptive learning simulations for military trainees, researchers showed significant improvement in post-traumatic stress behaviors, following the use of an adaptive training simulation known as CHARLY, Chaos Driven Situations Management Retrieval System, which leveraged adaptive learning and virtual reality to simulate real-life experiences prior to deployment (Wesermann et al., 2016). Several examples demonstrated the value and impact of adaptive learning and its efficacy in enhancing employee, student, and soldier performance. Maaliw (2016) found that an added value for adaptive learning systems to

support learner personalization and to deepen learning efficacy necessitated a better understanding of the learner's style and the associated behaviors observed when using the eLearning system. These styles demonstrated a variety of active, reflecting, visual, verbal, and global learning approaches, mirrored in the self-directed learner attributes described by Guglielmino (2013), Kolb (2015), Maaliw (2016), and Williamson and Seewoodhary (2017), in order to deepen learning and prepare for continuous change.

Countries around the world, such as China (Wang et al., 2020), South Africa, and Switzerland (Mirata et al., 2020), Italy (Capuano & Caballe, 2020), and the United States (Dziuban et al., 2018) were interested in adaptive systems and adaptive learning strategies. In the Chinese study, comparing the effectiveness of adaptive learning systems compared to instructor-led classroom sessions demonstrated that personalized, student-centered learning provided by the online adaptive system (Squirrel AI Learning) provided significant improvement in student performance overall. The principles behind the adaptive learning design mirrored that of superior, instructor-led designs, including assessments to determine student ability, problems and activities tailored to the student's ability, intelligent feedback personalized for each student, and tutorials specifically focused on various ability levels (Wang et al., 2020). "In both studies, (comparing large classroom and small classroom to adaptive learning solution) students who used Squirrel AI Learning independently outperformed those taught by expert teachers, which was consistent with prior research in other regions" (Wang et al., 2020, p. 8).

Anderson (2019) pointed out the myths surrounding how adaptive learning was commonly understood by describing several examples supporting the perspective that adaptive learning was not just for online training programs. Adaptive learning was

applied in multiple ways to a variety of learning opportunities. One example at Arizona State University described the hybrid approach of assigning varied activities outside of the lecture, which provided a personalized approach to each individual student in combination with a larger venue training experience. This adaptive strategy provided a reduction to class lecture time, as the instructor adapted to the student's collective assignments (Anderson, 2019). In a later study, conducted at Arizona State University, Marienko et al. (2020) captured effectiveness metrics using adaptive learning technologies that showed a drop-out rate reduction from 13% down to 6% and overall pass rates increased from 66% to 75%. This demonstrated significant improvement, based on students participating in adaptive learning components supporting completion of college curriculum.

Marienko et al. (2020) found that Ukrainian teachers needed to continuously improve their technology skills to use emerging technologies to adapt their training techniques in order to provide personalized training for their students. As teachers pursued annual development activities, adaptive learning technologies and online training enabled them to increase their competencies. These technologies also benefited the teachers by extending this experience into their classrooms (Marienko, et al., 2020). Personalization of learning became more of a global trend. Adaptive learning programs were progressively being used across the globe (Marienko, et al., 2020). Knewton, one of the most recognized systems, connected knowledge elements and provided personalized recommendations for both teachers (selection of topics to cover) and students (which topics to work on more carefully) in order to increase learning effectiveness (Marienko, et al. 2020). Analyzing the implementation of an adaptive learning model within two

distinctly different universities (one in South Africa and the other in Switzerland), Mirata et al. (2020) found that the Swiss university noted that in order for the adaptive approach to be effective, SDL skills were critical, not only for learner success but also for application to occupational training (Mirata et al., 2020). In comparison, the South African university recognized access to technology and digital literacy was unevenly distributed throughout the higher educational system and was a barrier for disadvantaged groups within the region (Mirata et al., 2020).

Corporate training departments were consistently looking for ways to increase proficiency, decrease knowledge and skill gaps within industry and provide for differentiated training for employees with a variety of backgrounds. Through adaptive learning systems and techniques, corporate trainers found adaptive systems provided increased confidence in their employees (Lynch, 2019), the ability to focus on the specifics that needed to be learned (Lynch, 2019), and an accelerated time to proficiency and time savings (Howe, 2018; Lynch, 2019). Benefits provided by adaptive learning systems provided learners with flexible options, as content changed over time by recognizing the material an employee already mastered and provided new information tailored to each employee's learning needs (Lynch, 2019).

Andragogy and the Adult Learner

Cyril Houle (1961) was one of the original scholars to begin the discussion of life-long learning and SDL. Houle (1961) was the professor for Knowles and Tough at the University of Chicago in the 1960s. Houle (1961) began the discussions that drove Knowles and Tough to further explore SDL and to become the seminal scholars regarding this area of andragogy and SDL. Both Knowles (1975) and Tough (1979)

contributed to definitions of learning concepts and characteristics of andragogy and SDL. Houle's (1961) book, *The Inquiring Mind,* led him to study the attributes of adult learners and to dig deeper into the motivations of learners who desired to know and who valued continued learning (Brockett & Donaghy, 2005). Houle (1984) continued to discuss life-long learning and case studies that described observations that were contrary to original thoughts about learners, specifically that adults could continue to learn throughout their lives. The idea of continuous learning was new thinking in the 1960s and Houle, Knowles, and Tough contributed to the formation of seminal works regarding how adults learned (as cited in Brockett & Donaghy, 2005).

Andragogy, simply put, was defined as a conceptual framework about how adults learned (Knowles et al., 2005, p. 231) in contrast to how children learned. Knowles (1975) distinguished andragogy as an emergent theory that included a collection of overarching attributes an adult demonstrated when approaching learning, in contrast to pedagogy, which traditionally referred to the way a child learned. Scholars further elaborated upon the attributes of adult learners as part of the description of andragogical adult learning characteristics, such as changing perspectives toward more internal motivations as adults mature (Merriam, 2017), self-directed focus of learning (Tough, 1979), and critical thinking skills, as described by Brookfield (2017).

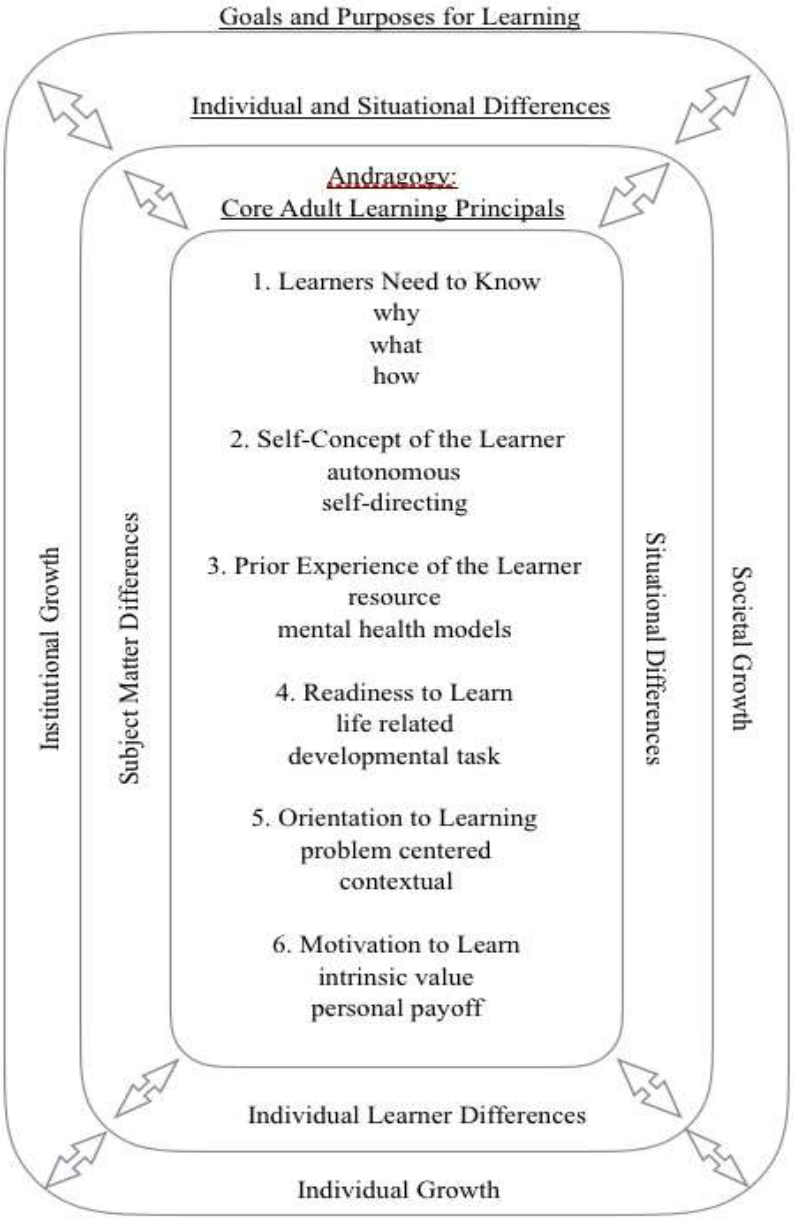
There are six specific characteristics of adult learners. 1) Adults need to know the 'why' behind the learning. 2) Adults need to be self-directed and influence their learning journey. 3) An adult's background and experience were greater than a child's level and that breadth of experience influences the adult's learning. 4) Adults are ready to learn when a situation or a need-to-know circumstance drives their reason for learning. 5)

Adults have a problem-centered or life-centered orientation to learning. 6) Adults are driven to learn by both intrinsic as well as extrinsic motivations (Knowles, 1975). Knowles provided a solid foundation for recognizing the different needs and characteristics of adult learners. Knowles contributed leading scholarship in the area of andragogy and recommended that, in order to capitalize on the adult's experience, the teacher's role should shift to collaborating and sharing with adult students to facilitate their knowledge acquisition. Knowles et al. (2005) collaborated and further outlined multiple ways to develop effective instructional designs to create an optimal learning environment for adult learners. Knowles' contribution to the field of adult learning was considered seminal work. Knowles' scholarship was the cornerstone for any endeavors in andragogy (Ma, 2017).

As shown in Figure 2, Andragogy in Practice, Knowles et al. (2005) depicted the six core arenas of Andragogy in Practice (p. 149). The learning design and practices required to meet the needs of adult learners were multi-faceted and situational. The approach for learning design and application embraced sound instructional design, considered the adult learner's prior experience, and recognized multiple learning theories depending on the desired outcomes (Chu, 2017; Grow, 1991; Knowles, 1975). Whether a cognitivist approach for knowledge acquisition, a constructivist approach to strengthen motivation and social learning, or behavioral approaches to learn and demonstrate behavior, designing instruction effectively required an holistic view of the needs of the learners and overall goals of the program (Chu, 2017).

Figure 2

Andragogy in Practice



Note. Adapted from "The Adult Learner" (6th ed.; Knowles et al., 2005, p. 149).

As Knowles (2005) described in his theories of andragogy, adult learners were self-directed and their motivation to learn was influenced by multiple factors (Knowles et

al., 2005). Adult learner principles were described as: needing to know (why, what, and how), followed by self-concept and learner experience. In order to demonstrate behavior, a learner must acquire knowledge first (cognition) and then, once mastered through doing (behavior), can progress to mastery and constructing new models or new applications of the learning, which in turn expands the new knowledge (Knowles et al., 2005). This comprehensive view of the learner and the situational differences that influenced the choice and approach for design of their learning was the foundation of adult learning and andragogy (Chu, 2017). Whether the learner was motivated to learn or had a preference or orientation to various types of learning, their overall readiness to learn influenced which learning theory should be chosen and deployed. The workplace ecosystem and environment shaped how a learning outcome should be constructed to maximize learning and application. The goals and the training situation influenced the choice of theories applied in order to create the best result (Gottfredson & Mosher, 2012).

Andragogy and SDL were complementary disciplines. Both Knowles and Henschke described that SDL was the description of activities and techniques, methods, and procedures used within the construct of the adult learner characteristics or Andragog's approach to learning (Henschke, 2016c), while the overarching andragogical theory was demonstrated through the activities and attributes of an adult, self-directed learner (Knowles, 2005). Recognizing the characteristics of the learners and the context for learning within their environment provided the foundation to build an effective training structure (Grow, 1991). The benefit for embracing the need for upskilling, reskilling, and cross-skilling of adult education was supported by andragogical principles, which defined adult learning, such as encouraging SDL or providing a systemic and

flexible framework for instruction to support the overall learning process (Aliping & Parcasio, 2018). Nordin et al. (2016) observed in their research in Taiwan conducted in a higher education environment, that there was a relationship between SDL attributes and overall learner readiness and success throughout life.

DeCelle (2016) identified the importance of andragogy when evaluating and enhancing nursing education. As the demand for nurses continued to increase, nursing educators focused on ways to increase nursing knowledge through well-constructed training programs based on andragogical principles. As online training programs and a variety of social media and online training became available, in order to expand upon their knowledge and build upon their experiences, nurses needed to cultivate SDL skills in order to support continuous learning within the nursing profession (DeCelle, 2016). Andragogical approaches to training interventions were more evidenced in the needs of today's online nursing students now, more than ever. Non-traditional online nursing students exhibited more readiness, autonomy, and were highly motivated to pursue learning goals. These self-directed skills and attributes resonated with the definitions of andragogy as it related to nursing students who needed to continually build upon their expertise throughout their careers (DeCelle, 2016). Charungkaittkul and Henschke (2018) recognized that companies all around the world were discovering the need for better strategies to reinforce continued learning to support the change from an industrial learning society to a society focused on knowledge acquisition. As the pace of change continued to accelerate, the importance for companies to focus on andragogy also increased to meet the learning needs of adults in public education and private

organizations worldwide. Focused effort to create effective training programs for adults became a critical lever for business success.

Self-directed Learning

As corporations strove to provide the best training experiences for employees, more Learning and Development (L&D) professionals were focused on better understanding learner preferences, learner experiences, and the learning environment, to create a comprehensive learning experience for the learner (Bersin, 2017). Prior research was focused largely on the educational environment, however, as more companies were looking to increase SDL to enhance critical thinking and develop life-long learning, which in turn enhanced overall organizational or training environment effectiveness (Brookfield, 2017). As the global economy or global industry continued to change and evolve with increasing amounts of information being readily available to a wider audience with constant access through the internet, SDL skills and readiness to learn and improve on one's own become recognized as increasingly valuable skills to develop (Curry et al., 2017).

According to Ma's (2017) extensive research, shown in Figure 3, on SDL definitions, multiple scholars agreed that a self-directed learner was characterized by the learner's ability to make distinct plans, evaluate their learning needs, and create strategies to fulfill learning goals (Guglielmino, 1977; Houle, 1961; Knowles, 1975; Tough 1979). Learners were also able to take the main responsibility as their own change agents (Brockett & Donaghy, 2005) and Hiemstra (1994). Multiple scholars observed that adult learners who demonstrated self-directed tendencies also demonstrated an ability to

tolerate ambiguity and confusion, change goals, and persevere to achieve learning goals (Ma, 2017).

Figure 3

Distribution of Definitions According to the Year with Authors

		Greene	1973						
		Dressel and Thompson	1973	Mezirow	1981				
		Knowles	1975	Spear and Mocker	1982				
		Dave	1975	Smith	1983	Brockett and Hiemstra	1991		
		Guglielmino	1977	Chene	1983	Hammond and Collins	1991		
		Moore	1977	Kasworn	1983	Candy	1991		
Houle	1961	Skager	1978	Brockett	1985	Piling-Cormick	1996		
Touch	1967	Gelpi	1979	Long	1987	Garrison	1997	Garrison and Archer	2000
1960s		1970s		1980s		1990s		2000s	

Note. Adapted from Ma (2017).

Hiemstra (2013) outlined a thorough review of the various definitions and perspectives about SDL and what this meant to a variety of scholars. In a broad definition of SDL, Hiemstra (2013) described the following SDL characteristics: learners become empowered to take increasing responsibility for their learning, self-direction can be considered as a continuum (so all learners possess some attributes of SDL readiness), self-direction does not mean the learning happens all at once or necessarily in isolation, self-directed learners are able to transfer their learning from one situation to another, a variety of activities and resources are used by the learner, teachers best support self-directed approaches through dialog, and questioning and facilitation to promote critical thinking (Brookfield, 2017).

While the research on SDL evolved over the last 100 years, there was little research focused on SDL for call center employees. The research on SDL suggested that adults could learn to be more self-directed in their learning and possess the ability to

continually learn and evolve their skills (Grow, 1996; Merriam, 1991, 2020; Williamson, 2007; Williamson & Seewoodhary, 2017). Williamson's (2007) findings were specifically relevant in workplace learning as employees were constantly asked to improve their skills and to respond to increased skill and knowledge development throughout their nursing careers.

Grow (1996) began the outline of the staged SDL model (SSDLM) by describing the four stages of students' progress starting from dependence in learning to SDL. The stages included: stage 1) dependent, low self-direction; stage 2) interested with moderate self-direction; stage 3) involved with intermediate self-direction, and stage 4) with high self-directed characteristics (Grow, 1996). Grow contributed insightful statements to support the pursuit of life-long learning. "I present this model, not as a definitive thing, but as another statement in the ongoing conversation of those who encourage self-directed, lifelong learning" (Grow, 1996, p. 21). Grow's statement challenged the training community to keep thinking and discussing the ideas of self-direction and continuous learning.

While Siefert et al. (2016) argued that SDL was a component of bricolage within a higher educational context, their ideas expressed what was already occurring in many professional education contexts. Researchers within the medical and technical fields were increasingly searching for ways to encourage their nursing students, meteorological employees, pharmaceutical interns, and other professional employees to further their learning after graduation and formal university training is complete (LaDue & Cohen, 2018; Shen et al., 2014; Williamson, 2007, 2017). Expecting that learning was done when graduation was over significantly reduces the effectiveness of these employees whose

fields are rapidly changing and evolving, due to technology and the expansion of knowledge (Gugilelmino, 2013). Bricolage, as the French term described, was the ability to construct something new from a diverse range of resources or ideas (Siefert et al., 2016). The modern learners needed to build upon new learning consistently as their field was ever changing. In order to keep up with the advancing technologies and overall evolution of everything in medical fields, technology and the sciences, without the ability to evolve and build upon knowledge in multiple situations, the modern learner was left behind and will not be successful in future society (Bersin, 2017).

Brockett and Hiemstra (1991) investigated personality traits and aspects, such as the PRO – Personal Responsibility Orientation model. Research focused on self-direction and learner readiness expanded to more than the learner's perception and the learner's environment, but also included the learners' personal characteristics and willingness to take control of their learning by focusing on both external factors, as well as internal factors added to the view that self-direction was part of the continual learning process, or 'continuum,' as Hiemstra described. Curry et al. (2017) noted that several scholars (Hiemstra, 2013; Knowles, 1975) described adult learners who were self-directed in more humanistic learning terms, referring to the learner's ability to make their own choices and decisions to accomplish their learning goals.

Towle and Cottrell (1996) summarized observations for medical education focused on ways to improve the learning for medical students at the University of British Columbia in Vancouver, Canada. Towle and Cottrell focused on adult learners; they referenced Knowles' 1975 definition of SDL, where the students built on their prior knowledge, learned in context, and then applied in expanding contexts while elaborating

and reflecting on the entire process of learning. In striving to enhance the learning for medical students in their program, they explored not only the characteristics of their learners, but the value of matching learning activities to support SDL behaviors. In order for these students to be successful in careers as medical professionals, Towle and Cottrell (1996) recommended students strive to develop and continue their learning beyond the traditional classroom.

Setlhodi (2019) recommended that pacing and schedule influenced learner success when pursuing SDL activities, as the structure provided by a schedule gave the learner a guide for setting the pace and frequency of learning. As self-directed learners frequently demonstrated, evaluation and critical thinking skills were necessary skills demonstrated by self-directed adult learners to effectively engage in learning, and to make informed choices about how to proceed in their education (Brookfield, 2017). Learners who were passionate and interested in the topic often demonstrated a willingness to delve more deeply and adjust their own learning techniques (Nieman & Wang, 2017) and to apply reflection, which strengthened their knowledge. Reflection and critical thinking were closely aligned in supporting a learner's acquisition of deeper knowledge (VanWyk, 2017). Vygotsky's (1987) development theory supported the finding that learners who reflected continuously on their learning urged themselves to improve and monitor their own learning pace to achieve outcomes. Educators within the university environments observed the impact of developing self-directed readiness in their student population to prepare them for evolving workplace challenges (Grow, 1996; Guglielmino, 2013) and illustrated in Giuseffi's (2019) assertion that, "Self-directed learning (SDL) adds to the richness and efficacy of learning and prepares adults for the

challenges in today's professional environment and leads to further personal enrichment" (p. 111).

Grover et al. (2017) investigated the impact of SDL on mature and retirement age adults and the impact of learning on motivation and wellness. The ability to pursue additional learning and participate in taking the initiative to expand learning demonstrated Knowles' (1975) original concepts of SDL. Mature learners were able to determine their own learning needs, take responsibility for organizing their learning experiences, and evaluate the effectiveness of their learning (Grover et al., 2017). The World Health Organization (2015) found that when learners took responsibility for their own learning outcomes, it contributed to healthy aging through active participation in nurturing activities. These findings were significant in that they reflected the growing population of mature adults. This was further reinforced by demographic data that suggested 20.6% of the world's population would be 65 and older by the year 2030 (U.S. Census Bureau, 2015, as cited in Grover et al. 2017).

Herod and Kop (2017) focused on the connection between SDL characteristics and self-help communities supported through online communities. Their research observed many characteristics of the self-directed learner, such as Knowles' (1975) defined process for learner's taking initiative to learn without the help of an expert. In a study focused on recovery support for adults suffering from PTSD, participants demonstrated learning initiative, peer collaboration, and the construction of new knowledge created by the participants (Herod & Kop, 2017). These characteristics were hallmarks of the self-directed learner and even demonstrated advanced exchanges of knowledge through peer sharing about lived experience, which further propelled the

group's collective knowledge. The benefit of this online, self-help learning experience supported the adult learning needs of a wide variety of people in a fluid and informal context, which enabled them to learn from one another and to build their knowledge without the need for formal education and within a very self-directed and customized fashion (Herod & Kop, 2017). Self-directed learner readiness was a key indicator of student characteristics. One basic premise of SDL was the understanding of the person's learning style, learning preference, and the ability to discern and determine appropriate learning interventions. The ability to identify these characteristics in oneself and then to self-assess progress was a critical component of learner readiness (Van Duyne, 2017). For learners to grow, learn, and change, the adult students needed to develop an awareness of needs, understanding of their preferences and thinking styles, and how a variety of characteristics influenced their readiness to learn and readiness to pursue learning in a self-directed manner (Van Duyne, 2019).

Curry et al. (2017) expanded upon the notion of self-directed action and learning through the study of language learning at the University of International Studies in Japan. While investigating learner autonomy and the characteristics required to achieve goals in an online language course, the study uncovered the correlation of similar characteristics found in SDL, such as awareness of behaviors and evaluation of approaches to be successful in learning. Learners who were able to regulate behavior and accomplish self-directed and autonomous goals shared similar characteristics, such as ability to determine learning needs, evaluate and restructure strategies for learning, relate and learn with peers, and select appropriate resources for extending their learning (Curry et al., 2017; Shen, 2014; Williamson, 2007, Williamson & Seewoodhary, 2017).

In support of the training approaches needed to support learners, Alsobrook (2016) provided an outline of thoughts from various scholars focused on techniques teachers could use to focus on enabling learners to think for themselves by providing provocative questions to prepare the students to expand their knowledge and learn how to learn rather than to be spoon-fed knowledge. This type of learner readiness aligned to current thoughts about the importance of building SDL attributes, as multiple training programs, especially in the medical field, searched for ways to encourage continuous life-long leaning in their students (DeCelle, 2016; Edmonds et al., 2018; Guglielmino, 2013; Khan, 2018).

In many workplace or corporate training environments, the short shelf-life of knowledge drove training groups to focus on ways to encourage employees to continually learn and to develop SDL skills to remain productive and to consistently develop expertise (Alsaadat, 2017). Several scholars determined that self-directed learners exhibited desirable behaviors useful to learning environments and transferable to the workplace, such as acquiring new information, developing cognitive presence to extend knowledge, evaluating goals, planning strategies for learning, and completing activities (Geng et al., 2019; Robinson & Persky, 2020). Blended learning programs routinely found in workplace environments also provided a superior combination of structured learning guidance, while facilitating opportunities for the student to self-direct their own learning goals (Geng et al., 2019; Khan, 2018).

In research focused on SDL, Loeng (2020) compared the distinctions made by previous scholars regarding individual or solo self-directed actions as described by earlier scholars (Houle, 1961; Knowles, 1975, Tough, 1978). Leong (2020) further elaborated on

the social context of self-direction and explained the perspectives shared by multiple scholars (Brookfield, 1985; Garrison, 1997; Merriam & Baumgartner, 2020) who focused on the collaborative aspects and structures that supported learning readiness in connection versus in isolation. Caffarella (1999) expanded on ways to support self-determined planning and goal identification for learners. Caffarella contributed the idea that capturing the learning agreement between a teacher and student was further supported through the creation of a 'learning contract' created by the learner and confirmed by the instructor. Similar to a learning contract, Edmonds et al. (2018) explored the impact of SDL activities within an orthopedic training program. Edmonds et al. (2018) found that practice-based self-assessments increased with modest improvement in documentation habits, which were enhanced through the application of SDL techniques. These techniques led Edmonds et al. (2018) to recommend the Personal Improvement Plan. The plan included reflection to support the surgeon's abilities to review procedures and determine best practices for future treatments and patient care (Edmonds et al., 2018), thereby reinforcing SDL and application of skill.

Self-directed learning (SDL) was considered an essential competency for the modern worker. Workers in multiple business settings were required to constantly improve and adapt to continuous changes in order to not become obsolete, as the workplace and work practices continually changed in order to become more productive and competitive (Neelen & Kirschner, 2017). The relationship between SDL readiness and the need for a learning organization were closely connected. The learning organization was able to learn both collectively and individually. In order for the organization to remain competitive in constantly changing times, the mission, vision,

goals, values, work culture, and environment impacted how employees were able to embrace SDL and development (Neelen & Kirschner, 2017). As referenced in an industry trade journal focused on corporate training trends and techniques, the Association of Talent Development (ATD, 2019) outlined several tips for Learning and Development professionals in Human Resource departments to use when creating SDL programs within their training departments. Building training plans to support the need for employees to learn continuously was an ever-increasing focus of Human Resource staff to prepare employees for a constantly changing workplace.

Self-directed learning increased for Learning and Development professionals, as Deloitte (2017) research confirmed 85% of participants cited learning as important to them in their jobs, driving training approaches to focus on using learning strategies, like SDL to provide greater flexibility to close skill gaps (Buecheler, 2019). Encouraging SDL strategies in the workplace further developed employees' skills and provided several important benefits, such as: enabling greater development of specialized skills, allowing employees to adjust learning to their specific needs, and supporting deeper learning experiences rather than superficial learning (Andriotis, 2021). As employees in the workplace demanded further specialized training programs tailored to specific needs, corporate training departments focused on ways to provide SDL options. The results of a LinkedIn Learning Survey, focused on 2,000 Gen Z workers reported, 43% of Gen Z workers preferred SDL approaches (Buecheler, 2019).

Progressive themes emerged in various scholarly and business sectors that recognized the value and progressive nature of supporting self-directed learner readiness and developing a life-long learning focus to improve employee training and performance

(Raemdonck et al., 2017). In research supporting pharmaceutical businesses both studies found that implementing appropriate learning programs to support self-directed attributes contributed to positive predictors of learner success in the work environment (Robinson & Persky, 2020; Zhoc & Chen, 2016). For both scientific and nursing environments, each of these business leaders, scholars, and educators recommended supporting SDL attributes as critical skills to be developed to compete and thrive in a global economy (Cadorin et al., 2017; LaDue & Cohen, 2018). From an educational perspective, SDL skills needed to be developed to support and increase competence, and higher educational programs needed to recognize the attributes required to support building 21st century skills (Kranzow & Hyland, 2016).

In a study focused on SDL as evidenced in information and communication technology (ICT) companies, Finnish researchers observed that the nature of the technology work to be accomplished was supported by SDL techniques to develop continuing problem-solving skills and adapt to the changing needs of the job (Lemmetty & Collin, 2020). As fast-paced working environments and continuing evolution of competency and skills were needed to creatively solve technical challenges, self-directed attributes support developed competencies through application at work. The goals for employees in the ICT industry to create innovative solutions, and to continuously upgrade their skills in response to changing technologies pushed employees to practically apply progressive and self-directed strategies to meet changing needs within their work environments (Lemmetty & Collin, 2020). Some participants viewed this as a negative context to continually develop, where others embraced the flexibility and the demand to evolve and change as a positive to further their own development in the study. “Self-

directed learners are typically motivated, tend to be more persistent, are independent, are usually self-disciplined, set their goals and remain goal oriented, and develop more self-confidence over time" (Cohen, 2017, p. 1). Learners engaged in self-directed activities, which included solo and collaborative planning with a mentor or peer (Cohen, 2017). Employees became active participants in assessing progress through activities, initiating the plan for development, and created a learning plan to best suit needs on the job and throughout their careers (Cohen, 2017).

Transformational leaders, such as Arie de Geus (1997), of Royal Dutch Shell Corporation, and Senge (1990), author of *The Fifth Discipline,* were recognized business leaders who germinated progressive thinking focused on the need for constant improvement and continuous learning. Senge's (1990) advanced management practices led the arena of thought regarding systemic approaches to enhance corporate competitiveness. One critical lever to influence and advance corporate competitiveness included a focus on continuous learning throughout the organization. Leaders from a variety of businesses recognized the influence of change on both business and educational success and the need to learn faster than the competition in order to survive (de Geus, 1997; Ries, 2011; Toffler, 1971). An added dimension to future survival in business was the ability to adapt, as Toffler (1971) famously stated in his book *Future Shock*, "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn," (as cited by Guglielmino, 2013, p. 2). This quote was significant in echoing the continued theme of constant change and continuous learning that resonated across industry over many years. Change and the need for learning within the workplace never slowed down, as recognized by Guglielmino (2013),

who studied SDL throughout her entire career spanning the 1970s through 2013. As the workplace continued to experience societal, technological, and global change, and skills and knowledge were in constant need of updating, Loeng (2020) noted the increasing need for SDL skills to support the notion of learning organizations which were considered in business terms to be a competitive advantage. Ries (2011) found that multiple business leaders quoted the need for faster and constant need for learning. Ries (2011) stated, "The only way to win is to learn faster than everyone else." (p. 111). These forward thinking and progressive ideas were built upon by business leaders who recognized that constant change required the need to be able to train continuously and adapt as needed. The need for continuing transformation and life-long learning and adaptability continued to increase, not diminish (Loeng, 2020).

SDL and SRSSDLR Survey

In order to better understand the adult learners' characteristics and the attributes aligned with SDL, Guglielmino and Guglielmino (1977) explored the importance of shaping learning within corporations, due to the continuous and rapid changes that influenced not only education but also business environments. As originators of the self-directed learner readiness survey (SDLRS) these scholars identified the attributes, created a readiness scale and distribution curve to identify and define self-directed learner attributes. Guglielmino's scale was a survey that included 58 items to determine attitudes and preferences in learning, with the items being scored on a five-point Likert scale and with a reliability of .87 (Guglielmino, 1977). The overall score indicated the learner's current level of SDL readiness. In later research, Guglielmino (2013) investigated multiple environments, which demonstrated the same common theme of constant change

driving the need to prepare learners, students, and employees to pursue SDL techniques throughout their careers to remain effective.

Williamson's (2007) research on SDL and the associated self-rating scale for learners was based on Knowles' original work in 1975 on self-directed learners. Knowles' (1975) views focused on the impact self-knowledge had on the learners and how assessing where the learners were on the continuum of learning would help the learner grow and develop SDL skills. Building upon Guglielmino's (1977) work, Williamson (2007) created a similar five-point Likert scale in a survey with five separate categories, including 12 questions for each section. The readiness scores were categorized as: low score from 60 to 140, moderate score from 141 to 220, and high score from 221 to 300. The five characteristics (also called attributes) were described as: awareness, learning strategies, learning activities, evaluation and interpersonal skills (Williamson, 2007).

As an educator of nurses, Williamson (2007) and Williamson and Seewoodhary (2017) used the self-rating survey to better understand nursing students, as well as help them progress toward more independent and continual learning. In both studies, these researchers discovered that becoming a continuous learner (outside of the classroom and along one's career) was described as a critical career skill for a nurse practitioner to keep skills and knowledge aligned to the ever-changing world of medicine. Williamson (2007) built on the original development of the SDL readiness scale (SDLRS) developed in 1977 by Guglielmino. Williamson and Seewoodhary (2017) continued Williamson's (2007) earlier work on the characteristics of SDL within the medical education community. Following the earlier study, which also focused on nursing students, Williamson and

Seewoodhary (2017) surveyed the students in the nursing program at the College of Nursing at the University of West London. The exploratory approach surveyed all the nursing students in the program. The qualitative results showed themes supporting the efficacy of SDL within the population of nursing students. As students progressed through the four-year degree program, several activities were provided to encourage the students to value SDL techniques and to use these strategies to increase their own learning and to prepare for the demands of a professional medical career. This specific focus for the medical profession highly valued continual education and stressed that each nurse and medical practitioner realized that their continual knowledge supported career advancement and greatly improved effectiveness with patients and patient care. The SRSSDL survey instrument used in the original 2007 study was enhanced to include interviews for the 2017 follow up study. The results demonstrated that fourth year students did indeed increase their SDL scores and exhibited continuing and SDL behavior at increasing levels as seniors, as compared to those same students when they were freshmen at the college (Williamson, 2007; Williamson & Seewoodhary, 2017).

In contrast to the traditional four-year college experience, Primm (2019) focused on adult learners at a technical college and investigated the relationship between their andragogical characteristics, such as motivation, self-directedness, and problem-based learning approaches. Primm's (2019) approach and investigation of learner characteristics used a Self-Directed Scale survey to identify the learner's active learning perceptions compared to problem-based learning approaches within a course. Results from Primm's (2019) research using the self-directedness scale indicated significant differences pre and post, following the implementation of problem-based learning. Of particular note, Primm

(2019) observed a theme called “pedagogical conditioning” (p. 91), which described the challenge teachers faced when students exhibited low motivation for learning responsibility and expectations to be spoon-fed concepts by the teacher, in contrast to being self-directed learners. Sahoo (2016) found in Malaysian research conducted on Ophthalmology students, that using Guglielmino’s (1978) SDLRS scoring assessment used a slightly lower than baseline for SDL readiness attributes. However, the study confirmed that “students expressed that the SDL could be the driving force for lifelong learning” (Sahoo, 2016, p. 168). Results of Kaur et al. (2020) demonstrated attributes for SDL readiness in three categories, including: self-management, desire to learn, and self-control. These categories were similar to Williamson’s (2007) SRSDLRS five SDL attributes of awareness, learning strategies, learning attributes, interpersonal skills, and evaluation (Williamson, 2007, 2017). The research study focused on nursing students in India, found an encouraging trend toward self-direction where students were able to demonstrate a high degree of self-determination, despite lack of resources and barriers to nursing education (Kaur et al., 2020).

Niktienko (2009) compared two survey instruments, the Self-Directed Learning Readiness (SDLRS) and the Online Learning Environment (OLE) instruments to compare and evaluate a variety of e-learning and hybrid online courses. Though Niktienko (2009) found no statistically significant relationships between prior learning experiences, the research confirmed the importance of using the self-rating tools to predict and facilitate adult learner performance, as well as satisfaction with e-learning programs. It was notable that (2009) referenced Krathwohl’s 1984 taxonomy of the affective domain as it related to learner motivation and outcomes. Bloom’s (1984)

taxonomy was normally mentioned when discussing the cognitive domain, but both were valuable in better understanding the adult learner. Niktienko's (2009) conclusions revealed statistically significant differences in the learning styles as defined by Kolb's (1993) learning modes. The results showed two-thirds of the students exhibited one learning style labeled as diverger. However, the other two learning styles, called accommodator and converger, were nearly absent from the data. These results reflected similar learner characteristics and expectations predicted in the service/call center employee's attributes in the research to be discussed in Chapter Three.

Shen et al. (2014) explored SDL principles applied to a nursing curriculum at three Chinese universities, specifically: Fudan University, School of Nursing, Nantong University, Department of Nursing, and Xinlin College, Nantong University. As much of the research regarding SDL was shown to increase learner retention, curiosity, better critical thinking, decision making, and confidence, researchers were eager to explore the generalizability of SDL principles within various medical training programs. Similar to Williamson's research in 2007, Shen et al. (2014) found that the efficacy of these principles was shown in the results of their research. The research further explored the validity of their tool called the Self-Directed Learning Instrument (SDLI), which contained 20 items used to assess learning readiness. Specifically, four emerging factors were visible in the learner's results. These four categories were described as: learning motivation, planning and implementation, self-monitoring, and interpersonal communication. Shen et al. (2014) concluded that SDL was indeed a key factor that influenced lifelong learning abilities. These various adult learning and self-directed learner attributes described by multiple scholars (Niktienko, 2009; Primm, 2019; Sahoo,

2016; Shen et al., 2014) also aligned to Williamson's (2007) research on self-directed learner readiness. In the research focused on analyzing nursing students' learner readiness, Williamson (2007) identified five specific attributes which influenced successful SDL in the students. The five attributes were: awareness, learning strategies, learning activities, evaluation, and interpersonal skills.

Research on call center employees was sparse in the current literature. However, in two related studies conducted by Cornell University (Batt et al., 2004), with a follow-up study conducted by Doellgast and Brady (2019), themes were revealed to help better understand call center operations and the training needs of these employees across the globe. Doellgast and Brady (2019) stated that the single most important factor to ensure call center employee retention and reduce employee job stress was to provide effective training support. Of particular interest was the trend data that was focused on the financial service sector of the U.S. business industry. Demographic facts presented by the research showed that financial services industries focused on hiring candidates who possessed at least two years of college experience and on average were aged 28. Additional research revealed that the financial services sector offered the most amount of training, with six weeks on average for new employees. The research also found trends that the average employee took 21 weeks to become proficient on the job specific to the financial services segment. Batt et al. (2004) provided a rich set of details to help profile the needs specific to the call center population.

In later research conducted by Doellgast and O'Brady (2019) the impact of management practices and stress on call center workers was studied. One of the significant findings of the research found that high job satisfaction was correlated with

reports of higher training quality and greater training frequency. The employee population studied indicated lower stress levels when training properly prepared them to answer calls. The study described a connection between adult training needs and high stress from heavily monitored working environments, which included the absence of freedom to suggest and participate in SDL to support worker contributions. Contact and Service Center workplace environments could deploy training programs that ran contrary to the notion of adult learner readiness and andragogical principles by heavily monitoring every aspect of the employee experience (Murthy, et al., 2008).

Summary / Conclusion

Advances in science, technology, business, medicine, and the access to information globally through the internet was creating an increasing demand upon modern learners. The prior notion of adults completing their education left many of these learners unprepared for the reality of an employment environment that was more dynamic and in a state of perpetual change (Guglielmino, 2013). Regardless of industry or educational context, adult learners needed support in building self-directed skills. No longer was college and education a one-and-done event that would sustain an employee throughout a career. The skills needed to advance included the ability to build upon knowledge and continue growing skills and knowledge situationally and persistently (Sahoo, 2016).

The goal of this study was to investigate if the call center employees demonstrated any characteristics in relation to SDL and to determine if differences existed between the SDL characteristics and the employees' business efficiency scores. This research surveyed a group of call center employees working in a large financial

organization headquartered in the Midwest. The data showed whether these learners demonstrated SDL attitudes using the categories from Williamson's (2007) Self-Rated Scale of Self-Directed Learner Readiness Survey (SRSSDLRS). The five categories included: awareness, learning strategies, learning activities, evaluation, and the interpersonal skills associated with successful, self-directed learners (Williamson, 2007). Additionally, the research investigated whether adaptive training practices enhanced SDL effectiveness and the employees' ability to apply their knowledge to their work. As Grow (1996) discussed in his work on training adult learners, a mismatch between readiness and training techniques left the learner overwhelmed and unprepared. Gathering this data provided a better understanding of the call center employees' learning needs to make more effective decisions about future training interventions. The next chapter outlined the methodology used for this study.

Chapter Three discusses the methodology used to conduct the research in the corporate call center environment. Mixed methods (Creswell & Creswell, 2018) were used to gather employee perceptions of the training through the use of an SRSSDL survey. Qualitative and quantitative analyses were conducted to review the feedback and performance data collected from the training department. Research design, qualitative and quantitative techniques and research instruments used to conduct the research will be outlined.

Chapter Three: Methodology

Introduction

While the research on SDL evolved over the last 40 years, there was very little research focused on SDL for call center employees. Williamson and Seewoodhary (2017) determined that adults who learned to develop a self-directed approach to learning and extending their knowledge were better prepared for the changing work environment that demanded continuous learning to improve skills and knowledge throughout their careers. As discussion continued within corporations and within educational communities about the practicality and efficacy of adaptive training approaches, testing the adaptive learning intervention provided additional insights to both the specific call center training department and the scholarly community, with data in the area of adaptive learning (Yang et al., 2013).

The research study participants (company employees and contractors) were chosen from a purposive sample from a cross-training project with the Service Training division. The adult learners were invited to respond to an electronic survey related to their perceptions of SDL attributes specific to a training project focused on cross-training. The program did not focus on new hire training, but was considered a cross-training effort to upskill existing employees within the department. Because the researcher worked within the training department, reflexivity was implemented to dig more deeply into the qualitative data to identify themes regarding both the learner attributes and the adaptive learning strategies used within the training program. Insights from the qualitative and quantitative data informed and enhanced the manager's decisions for future training program design and development.

Problem and Purpose Overview

The goal of this study was to investigate if the call center employees demonstrated any characteristics in relation to SDL and to determine if themes and trends existed between the SDL characteristics and the employees' business efficiency scores. Additionally, the research investigated whether adaptive training practices enhanced SDL effectiveness and the employees' abilities to apply their knowledge back on the job. As Grow (1996) described when training adult learners, a mismatch between readiness and training techniques could leave the learner overwhelmed and unprepared. Gathering this data provided a better understanding of the call center employees' learning needs to make more effective decisions about future training interventions.

This study surveyed a group of call center employees working in a large financial organization headquartered in the Midwest. The data showed whether the learners demonstrated SDL attitudes and attributes, using these five categories: awareness, learning strategies, learning activities, evaluation, and interpersonal skills associated with success and self-directed learners (Williamson, 2007; Williamson & Seewoodhary, 2017). The research goal was to investigate if the call center employees demonstrated any characteristics in relation to SDL and determine if differences and themes were evidenced between the SDL characteristics and the employees' business efficiency scores. Additionally, adaptive training practices were explored to observe whether the SDL impacted the employees' ability to apply their knowledge back on the job.

Research Design

This study investigated the following three research questions and five hypotheses about self-directed learner readiness and adaptive learning techniques used within a

corporate training environment for call center employees. The following research questions and hypotheses guided the study.

Research Questions and Hypotheses.

Research Question 1: What self-directed learner readiness attributes were evident in the call center population?

Research Question 2: To what extent did the adaptive training intervention impact learner outcomes?

Research Question 3: To what extent did learner readiness impact the employee's ability to apply their new knowledge on the job?

Null Hypothesis 1: There was no difference between Self-Rated Survey Self-Directed Learning (SRSSDL) with regard to employees who participated in the adaptive training approach.

Null Hypothesis 2: There was no relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and course final test scores.

Null Hypothesis 3: There was no relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and Average Handle Time (AHT) scores.

Null Hypothesis 4: There was no relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Repeat Call-Back (RCB) scores.

Null Hypothesis 5: There was no relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Branch View Scores (BVS).

Hypothesis one investigated the relationship between self-directed learner attributes and how the adaptive learning interventions influenced learner outcomes. Hypothesis two analyzed the data to determine whether the participants' SDL readiness

score influenced the learner's test score. Hypotheses three through five collected SDL data from the surveys and the three business efficiency metrics captured by the company to monitor performance, to investigate how these variables impacted employee learning in an SDL context. Data focused on the subject of learner readiness and the impact of readiness attributes on employee performance had previously been unexplored in this business training environment. Table 1 illustrates the instrument used to collect data to answer the research questions and hypotheses.

Table 1

Research Questions and Hypotheses Mapped to Data Collection Instruments

Question	Data	Instrument	Origin/Repository
RQ1 - Learner Readiness Attributes	Survey responses Self-reported	SRSSDL survey, Williamson, 2008	Exported from Qualtrics to Excel spreadsheet
RQ2 - Adaptive intervention	Attendance and Test Scores, SRSSDL score	SRSSDL survey	Exported from Qualtrics and LMS to Excel spreadsheet
RQ3 - Readiness impact on performance	Participant comments, business performance data	SRSSDL survey and business reporting (Salesforce CRM)	Exported from Qualtrics and Salesforce to Excel spreadsheet
H1 - Adaptive/Non Adaptive & SRSSDL	Participant comments and participant scores	LMS grade & attendance and SRSSDL survey	Exported from Qualtrics and LMS to Excel spreadsheet
H2 - Test Scores & SRSSDL	Participant scores	LMS grade & attendance and SRSSDL survey	Exported from Qualtrics and LMS to Excel spreadsheet
H3 - AHT & SRSSDL	Participant performance stats	SRSSDL survey and business reporting (Salesforce CRM)	Exported from Qualtrics and Salesforce to Excel spreadsheet
H4 - RCB & SRSSDL	Participant performance stats	SRSSDL survey and business reporting (Salesforce CRM)	Exported from Qualtrics and Salesforce to Excel spreadsheet
H5 - BVS & SRSSDL	Participant performance stats	SRSSDL survey and business reporting (Salesforce CRM)	Exported from Qualtrics and Salesforce to Excel

The goal of using the mixed-methods research methodology was to provide a robust view of not only the participants' perceptions of their learning experience, but to analyze observed attributes and compare the employees' performance against the trends that were revealed. The quantitative analysis in this mixed-methods study provided a statistical approach that was favored in the researcher's business environment. Providing quantitative data was greatly respected in the service department and in the corporate, financial training department, where statistical data were regularly captured as a matter of business practice to monitor call center performance.

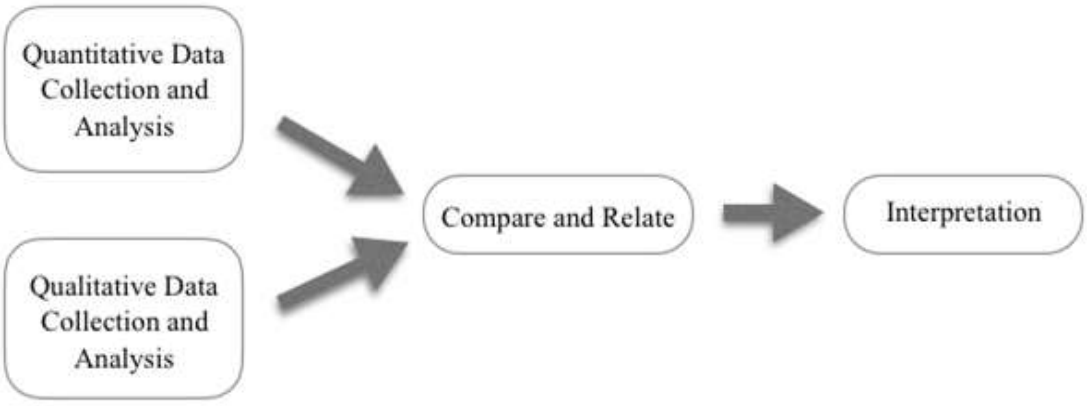
Qualitative analysis was used to analyze themes that emerged from the participants' comments. A triangulation approach was used to provide deeper understanding and validation of comparative results from the qualitative and quantitative perspectives. Thus, validity was enhanced when the data collection method used triangulation (Frankel et al., 2015). Triangulation enhanced efforts to reduce bias and supported the confirmation of hypotheses explored in this research (Creswell & Creswell, 2018). Triangulation of data was used by comparing demographic data focused on participant years of education with categories including high school completion through advanced degrees achieved and years of experience, from less than a year in job, through 10 plus years of experience. Demographic data were used to provide additional insight into experience variables that influenced learner and participant outcomes (Maxwell, 2013).

Frankel et al. (2015) stated that the mixed methods approach enabled the researcher to use both quantitative and qualitative methods to explore the relationships between two or more variables. Gathering data using both methods enriched the insight

and themes uncovered from the data (Creswell & Creswell, 2018). The researcher used a convergent, parallel mixed methodology design, as shown in Figure 4, to analyze the data from surveys related to participants' perceptions of their learner readiness compared to their performance metrics when completing their work-related activities after training. Data from participant surveys and learner performance metrics were captured separately and analyzed separately. Further analysis and interpretation were conducted to investigate themes, trends, and differences between adaptive techniques and the presence of SDL attributes. As described by Creswell and Creswell (2018), a mixed-methods approach provides a robust view of trends from the quantitative data, themes from qualitative data, and enables the researcher to explore if the data captured separately confirms or disconfirms the overall findings.

Figure 4

Convergent Mixed Methods Design Model



Note. Adapted from Creswell, J. W. & Creswell, J. D. (2018, p. 118).

Participants were invited to voluntarily participate in a survey via email, which included asking for their informed consent. Following survey data collection, the test scores from the training program and the adaptive training intervention, as well as three

specific business efficiency metrics were analyzed to determine if there was an observed trend between self-directed learner characteristics and increased proficiency using job-specific performance measures. Since the research participants worked in a call center environment, the three business efficiency metrics included the following three measures: average handle time (AHT), repeat call backs (RCB), and branch view scores (BVS) which were industry standard measures for evaluating call center employee job performance.

Population and Sample

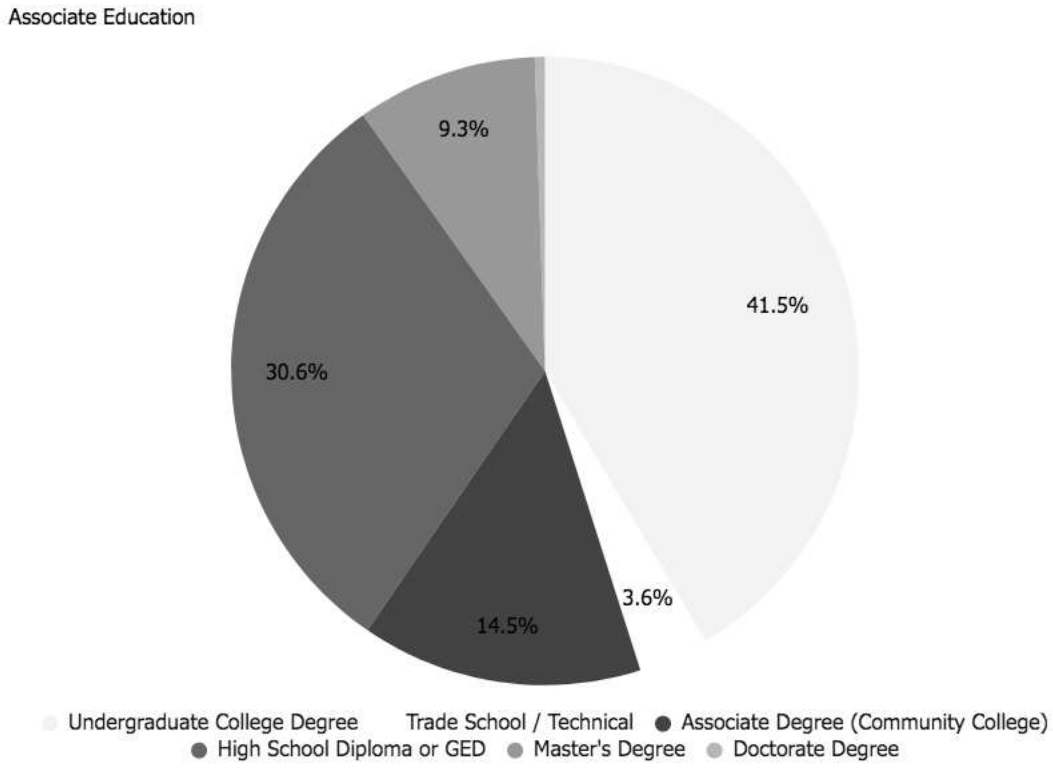
Participants in the study were company employees or contractors. The researcher had no direct relationship, nor supervisory responsibility with the participants. Study participants were chosen from a purposive sample from a recent cross-training project in the training division. The population size for this study included 449 call center employees. Surveys were sent via email to 449 participants and 154 responses were received, which provided a 34% response rate to represent a statistically valid trend with a confidence interval of 95% (Fraenkel et al., 2015). As the characteristics of the learners who were part of SDL intervention were least understood, the purposive sample of participants from this recent program provided an opportunity to explore the impact of the new training approach. The participant sample was chosen for this study in order to investigate if there was a difference between learner characteristics and training techniques for this specific group of employees (Fraenkel et al., 2015). The participants surveyed in this study had been assigned to a specific cross-training program, which included SDL activities, as well as adaptive learning interventions. The department regularly monitored performance data on employees' abilities to apply new learning to

on-the-job performance, which enabled the researcher to gather and analyze quantitative performance data. Collecting qualitative data regarding participant perceptions about the training program, as well as proficiency data focused on their actual behavioral impact on the job provided a robust set of data regarding this new cross-training program and the impact upon the learners.

Participants responded to the SRSSDL survey and identified their educational experience by choosing their highest level of educational achievement. The majority of participants had earned either a high school diploma (stated at 31%) or had completed a four-year college degree recorded as 42%. Figure 5 illustrates all six levels of educational achievements recorded by the participant survey results.

Figure 5

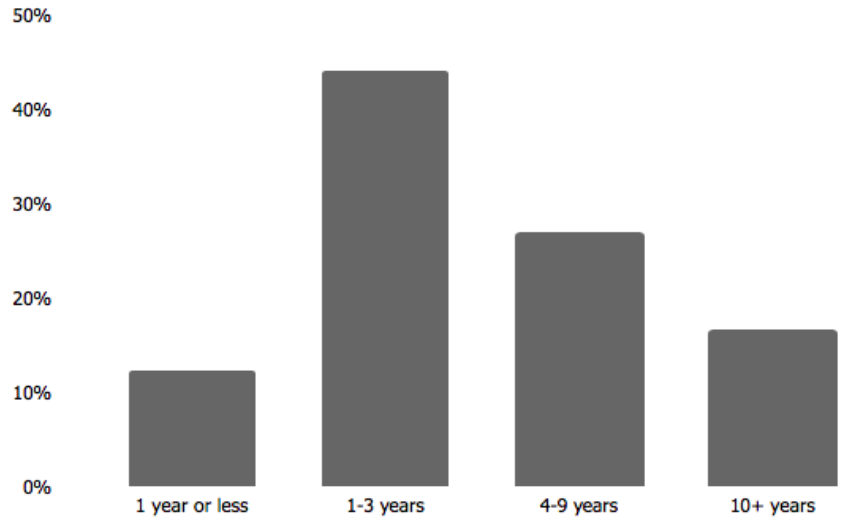
Participant Education Experience



Participants responded to the SRSSDL survey and identified their job experience related to call center service department experience. The majority of participants showed as 44% had worked in a service-related job within the corporation between one to three years and 27% of the participants had worked between four to nine years within the company service department, as shown in Figure 6.

Figure 6

Participant's Contact Center Experience



Instrumentation

Several scholars used surveys to gather self-directed learner attributes from learners in a variety of contexts, such as nursing training and medical training (Candorin, 2017; Shen, 2014; Williamson, 2007; Williamson & Seewoodhary, 2017) within educational contexts (Guglielmino, 1997, 2001; Shen et al., 2014). Research conducted by Cadorin et al. (2017) and Shen et al. (2014) examined several survey instruments, including Williamson's (2007) SRSSDL survey instrument, which focused on gathering learner characteristics and self-directed learner attributes that influenced SDL behaviors.

In order to evaluate the contact center employees' readiness for self-directed learning, SDL scores were gathered using Williamson's (2007) SRSSDL survey instrument. The overall SDL scoring used to describe self-directed learner readiness were divided into three ranges across the distribution. The lowest score was 60 with the highest score at 300, as shown in Table 2. The low range included scores between 60 and 140, indicating a low level of self-direction in learning. A score in this range indicated that the learner required guidance from the trainer and required support to improve learning results. Scores within the range of 141 and 220 suggested moderate levels of self-direction. This range suggested that the learner(s) were half-way to becoming an independent self-directed learner with areas of improvement in evaluation and strategy to determine when trainer guidance was needed. The third range included scores between 221 and 300, indicating high self-direction. This range indicated an effective learner with goals to maintain developing strengths and methods to consolidate learning efficacy (Williamson, 2007).

Table 2

Overall Self-directed Learner Readiness Score

Ranges	Level	Interpretation
60 – 140	Low	Guidance is needed from the instructor. Any specific changes necessary for improvement must be determined and a possible re-structuring of the methods of learning identified.
141 – 220	Moderate	This range is half-way to becoming a self-directed learner. Areas for improvement must be identified and evaluated, and a strategy adopted with instructor guidance when necessary.
221 – 300	High	This range indicates effective self-directed learning. The goal is to maintain progress by identifying strengths and methods for consolidation of the student's effective self-directed learning.

The higher the total score indicated on the distribution curve, the higher level of SDL was evidenced. The three ranges were classified as high, medium or low readiness.

Survey validity was tested in a Delphi study, which resulted in a Cronbach alpha score of 0.94 for internal consistency and 0.73 content validity (Cadorin et al., 2017; Williamson, 2007; Williamson & Seewoodhary, 2017). Gathering the distribution data of the overall SDL score for the call center population was expected to provide insight for training leaders to determine the appropriate training methods to meet the majority of learners across the scoring distribution.

Five specific categories were explored using the SRSSDL survey instrument as shown in Table 3, each category included 12 specific questions and one open-ended comment question. Awareness focused on relating to learners' understanding of the factors contributing to becoming self-directed learners. Learning strategies explored the various strategies self-directed learners should adopt to become self-directed in their learning processes. Learning activities specified the requisite learning activities learners should actively engage in to become self-directed in their learning processes. Evaluation focused on revealing learners' specific attributes to monitor their learning activities. Interpersonal skills investigated learners' skills in using interpersonal relationships which supported becoming self-directed learners. Table 3 describes the characteristics explored, the range assigned, and a brief definition of the SDL attributes.

Table 3

SRSSDL Category Definitions of *Self-directed Learner Attributes*

Attributes	Score Range	Category definitions
Awareness	1-60	Learner's understanding of factors that contribute to becoming a self-directed learner.
Learning strategies	1-60	Various strategies self-directed learners should adopt in order to become self-directed in their own learning processes.
Learning activities	1-60	Requisite learning activities learners should actively engage in order to become self-directed in their learning processes.
Evaluation	1-60	Learner specific attributes in order to help monitor their learning activities.
Interpersonal Skills	1-60	Learner skills focused on interpersonal relationships, which are pre-requisite to becoming self-directed learners.

Since Williamson's (2007) validated Self-Rated Scale Self-Directed Learning (SRSSDL) survey instrument was written originally for nursing students, the survey questions were revised slightly to align with terminology more familiar to the call center

population. Ten test surveys were sent to call center coaches and trainers to further ensure that the survey questions were worded appropriately for the call center participants. Permission from Williamson (2007), author of the SRSSDL survey, was obtained for the use of the survey and the modification of the survey questions shown in Appendix C.

Data Collection

To answer the research questions, a survey was sent to determine what self-directed learner readiness attributes were evident in this group of call center employees. Survey results captured the distribution of SRSSDL scores, then were individually mapped against a distribution graph. Descriptive and inferential statistics were used to analyze learner readiness attributes aligned with the five categories (Williamson 2007; Williamson & Seewoodhary, 2017) organized in the SRSSDL survey instrument. The categories included: awareness, learning strategies, learning activities, evaluation, and interpersonal skills. The modified SRSSDL survey instrument, used with permission (Appendix B) and modified with permission (Appendix C), is shown in Appendix E.

Survey responses as, well as course test scores gathered from participants that received specific adaptive training interventions during training and were analyzed using a two-sample *t*-test to determine if the scores showed any differences in SDL attributes between attendees who did not receive the same adaptive training interventions. Following survey data collection, the final test scores from the training program, as well as three specific business efficiency metrics were analyzed to determine if there was a difference between self-directed learner characteristics and performance measures back on the job. Since the group of employees studied work in a call center environment, the three business efficiency metrics used included the following three measures: Average

Handle Time (AHT), Repeat Call Backs (RCB), and Branch View Scores (BVS). Test scores were gathered from the course records to determine which participants received adaptive training modifications. The SDL scores and data were analyzed to determine the impact of SDL readiness on learner performance. Participants were asked in the survey if they would like to see their individual survey scores related to SDL attributes. Results were compiled internally and emailed to their work email addresses. Participants were asked to consent to the use of their responses and comments in analysis for work projects and for dissertation reporting, as shown in Appendix D.

Data Analysis

Self-directed learning attribute scores were documented and plotted to illustrate the overall distribution and presence of SDL attributes divided into the three main categories (high, medium, and low SDL ranges) identified in the SRSSDL survey instrument (Williamson, 2007). The data collected for the five SDL attribute categories were grouped and summarized in order to determine the presence and distribution of the attributes across the learner population studied (Williamson, 2007).

Within the study, quantitative analysis centered around the six hypotheses while qualitative analysis focused on the three research questions. Quantitative methods used to analyze the six hypotheses and determine statistical significance included: the Pearson Product–Moment Correlation Coefficient (PPMCC) to determine the potential for relationships between the variables, linear regression analysis, and two sample *t*-test of independent means (Butin, 2010; Fraenkel et al., 2015). For the purposes of analysis, this research recognized standard alpha for educational research at 0.05. Qualitative methods of analysis used coaxial coding, grouping, and categorizing to identify both similarities

and differences (Maxwell, 2013), and trend analysis techniques to investigate themes revealed for the three research questions (Butin, 2010; Creswell & Creswell, 2018; Fraenkel et al., 2015; Maxwell, 2013). These same coding and theme analysis techniques were applied to the open-ended feedback responses included from the SRSSDL survey received from the participants to further investigate various factors that influenced participants' SDL outcomes.

Ethical Considerations

Participant identities were protected throughout the study through the use of anonymous survey responses. Further protections to safeguard participant confidentiality were used to de-identify employee data from business reports that gathered test scores and the business efficiency metrics. No employee numbers or employee names were retained in the spreadsheets used to analyze the trends from participants to ensure confidentiality. In regards to the qualitative data based on participant comments, confidentiality was preserved through anonymous collection of all survey responses. Themes that emerged from analysis of feedback were aggregated to further preserve participant anonymity.

Data were stored by the division analytics team, per normal internal company processes. Data were analyzed internally and shared with company managers and business analysts for internal analysis. After the business analyst matched survey responses to test scores and business data metrics, data were de-identified and employee specifics were removed. The business analyst assisted the researcher in analyzing and correlating aggregated data for the purposes of the research study to support the dissertation process. Since data were processed and analyzed internally for company and

dissertation use, the data remained in the company's secure server system within an internal corporate firewall. Corporate records retention processes were in place to archive and store data securely for three years before purging from the server. These processes are governed by Records Retention Management (RIM) and Regulatory Compliance standards applied to financial firms for all internal records.

Original business efficiency metrics were captured regularly by the Service Analytics department related to training effectiveness. The researcher, business analyst, and training coordinator compared and analyzed the survey responses to business efficiency metrics captured by the department for effectiveness reporting. Data and trends were reported in general terms and all participant identities were delimited to protect participant identity when used in the dissertation (Creswell & Creswell, 2018; Fraenkel et al., 2015). As an additional safeguard to protect research participants, an Informed Consent Form (Appendix D) was provided as part of the participant agreement activities prior to launching the electronic survey, so participants were notified of the protections and uses of the data collected from the survey and from data collected through the service division reporting processes.

Summary

In order to better understand new training techniques used within the service division, a mixed-methods approach was used to analyze employee self-directed learner readiness and employee job performance after training. The researcher used a validated self-directed survey instrument (Williamson, 2007) to gather learner feedback to understand the employees' perceptions of SDL behaviors to gauge learner readiness. SDL readiness scores were analyzed to determine if SDL attributes were evidenced in the

learner population and if differences between higher or lower SDL scores showed any impact to job performance. Business efficiency metrics, participation data from the adaptive learning intervention, and course test scores were gathered and analyzed to investigate whether the variables impacted the learner's ability to adapt to new training techniques and to determine any change in training outcomes. The survey approach provided anonymous responses to help protect participant identities and confidentiality was ensured through the use of delimited data. Overall the goal for mixed methods analysis focused on gathering data about perception of the training techniques and quantitative data from participant proficiency metrics to provide a robust analysis of training program effectiveness which used self-directed and adaptive training techniques within the department for the first time.

Chapter Four discusses the qualitative and quantitative results gathered from the mixed method analysis of the contact center training program that included new SDL strategies and adaptive training techniques. The overall goal of the mixed-methods approach investigated whether SDL attributes were exhibited by the participants and explored whether the SDL attributes influenced the employees' learning outcomes positively. Further discussion includes whether the SDL attributes impacted the employees' business efficiency measures after completing the training program within the service division.

Chapter Four: Results

Introduction

The purpose of this mixed-methods study was to investigate the presence of self-directed learner attributes and to determine whether there was an impact to the employees' course test scores, behavior change following adaptive learning interventions, and improved performance back on the job after training. The researcher used qualitative analysis techniques to analyze self-reported SDL ratings and feedback collected from the SRSSDL surveys sent to participants. Overall SDL scores were calculated, as well as ratings for each of the five learner readiness attributes described as awareness, learning strategies, learning activities, evaluation, and interpersonal skills to determine distribution within the participant population.

Quantitative data were collected from the corporate LMS and business performance system to gather the course test scores, attendance records related to the adaptive learning interventions and the business efficiency metrics to monitor performance impact from three traditional contact center measures known as AHT, average handle time; RCB, repeat call backs; and BVS, branch view scores, which were traditionally monitored to determine effective contact center employee job performance. A *t*-test of two independent variables was conducted to determine differences related to adaptive learning intervention. The Pearson Product Moment Correlation Coefficient (PPMCC) and a *t*-test were conducted to test the relationship between the course test scores and SDL readiness scores. The PPMCC was conducted for the three business efficiency metrics described in hypotheses three through five related to Average Handle Time (AHT), Repeat Call Backs (RCB), and

Branch View Scores (BVS) scores, which represented industry standard business measurements for call center employees.

Using both quantitative and qualitative data provided a robust analysis of the participant performance related to SDL, as well as the employees' perceptions of their learner readiness. As Butin (2010) indicated, a mixed-methods analysis can reveal best practices to be applied in a learning context, based on analysis of multiple variables analyzed from the data collected.

As stated previously, the mixed-methods study analyzed both quantitative results, as well as qualitative data collected from participant responses to the Self-Rated Scale Self-Directed Learner (SRSSDL) readiness survey. The researcher's goal was to investigate the possible relationship between self-directed learner readiness and the possible impact on learner behavior and job skill proficiency. In order to set the stage appropriately, the detailed results from the research questions will be presented first as the survey results captured the overall SDL readiness scores, as well as the five main attribute categories, followed by a discussion of themes related to the learners' perceptions of their SDL attributes. The final segment focused on the quantitative data, which highlighted the results gathered from the business efficiency metrics related to employees' job performance.

Overall Self-directed Learner Readiness Scores

To explore the presence of SDL within the service training program, a survey was distributed to learners to determine their perception of SDL attributes, their readiness and strategies while learning to investigate an overall rating for SDL

readiness, and to determine which attributes were evident for the employees who participated in the adaptive learning program.

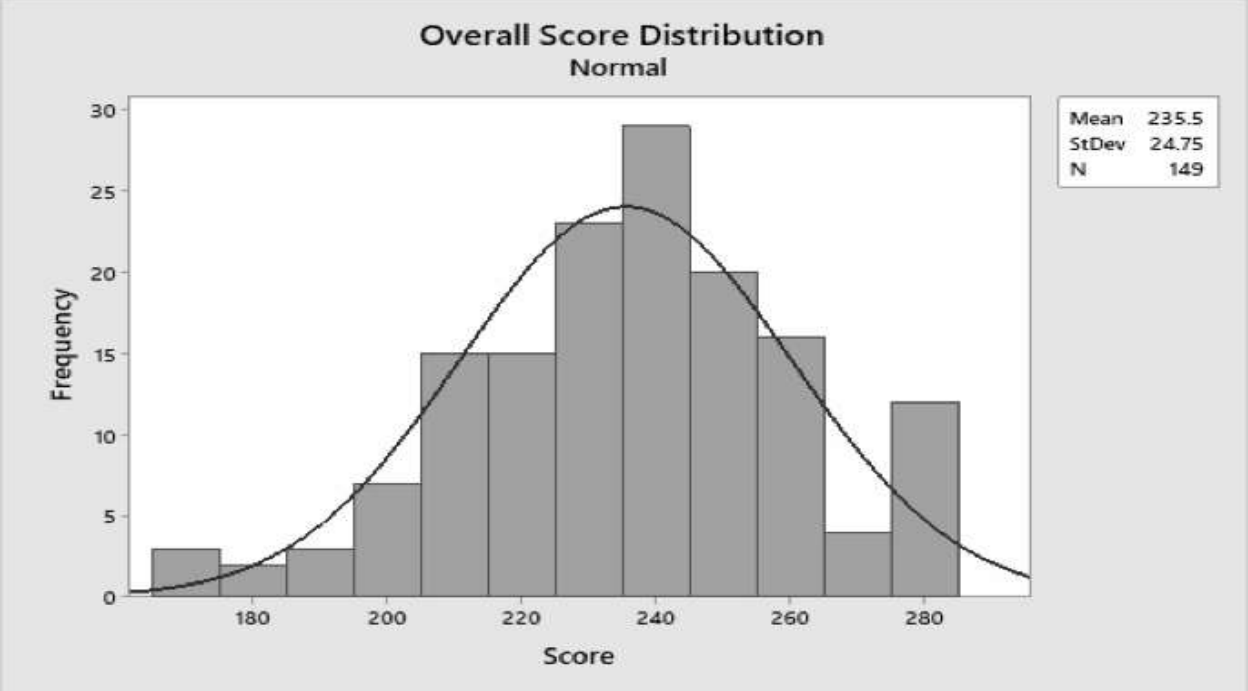
Research Question One

Research Question 1: What self-directed learner readiness attributes were evident in the call center population?

Participants responded to the SRSSDL survey to determine their self-reported perception of their SDL readiness. The SRSSDL survey instrument captured data on overall score level and categorized the responses across the five categories describing self-directed learner readiness. Figure 7 shows the overall score distribution, based on 149 responses to the survey. Low scores (60-140); Medium scores (141-220); and High scores (221-300) indicated varying levels of readiness to learn in a self-directed manner. The mean score was 235.5, indicating a high range of self-directed learner readiness for the employees who participated in the study.

Figure 7

Self-directed Learner Readiness Distribution



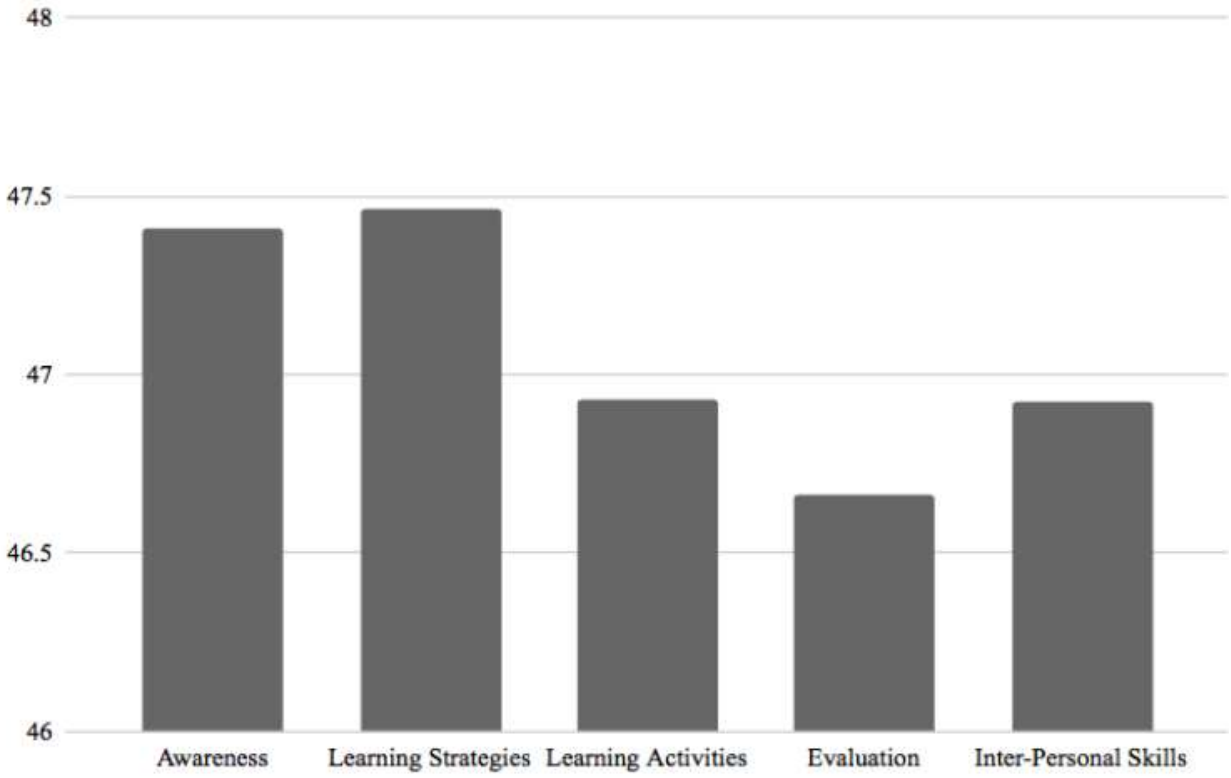
Note. Data gathered using Williamson's SRSSDL survey instrument, 2008.

Five Self-Directed Learner Readiness Attributes

The SRSSDL survey gathered data regarding five specific self-directed learner attributes. The five categories included: awareness, learning strategies, learning activities, evaluation, and interpersonal skills. Figure 8 provides an illustration of the self-reported feedback participants completed in the survey. Each category included 12 questions with a maximum score of 60. The attributes demonstrated by the majority of participants focused on learning strategies and awareness of learning needs. The participants were aware of their own learning needs and eager to determine learning strategies to increase their skill and knowledge. Interpersonal skills was ranked as their third highest attribute, as shown in Figure 8, which aligned to the expected behaviors for a call center employee.

Figure 8

Self-directed Learner Readiness Attributes



Note. SDL attributes as defined by Williamson's SRSSDL survey instrument, 2008. *Used with permission, Appendix C.

Five Themes Aligned to the SDL Readiness Survey Framework

Qualitative analysis of the participant survey comments revealed themes, which were aligned to the SRSSDL survey framework. The five categories within the survey framework included: Awareness, Learning Strategies, Learning Activities, Evaluation, and Interpersonal skills. Overall the participants rated high in the learning strategies category but provided feedback that the learning environment did not allow them the freedom to choose their preferred learning strategies. This disconnect between the strategies and the environment within the service training department caused the learners

frustration to pursue learning adequately and to cope with constant change within their environment.

Awareness - Overwhelmed by Constant Change

Feedback from the Awareness category reflected the dissatisfaction from participants and the feeling of being overwhelmed by constant change, which required constant training. Participant A's quote captured the pressure felt by multiple learners. Participant A said:

> We seem to be always in learning mode right now. Everything is changing and we are not asked if we would like to change. Our new learning has been forced upon us. Pushing a lot of us, me included to exhaustion.

Learning Strategies - Lack of Choice

Feedback from the Learning Strategies category revealed that almost all of the learners described dissatisfaction at not being able to learn at their own rate or choose when they learned. The following quote captured the heavily structured environment, which competed with the ideal SDL environment. Participant B said, "In my role, I don't decide my own learning strategy. Learning opportunities are sent to me by way of diagnostics, and reinforcement sessions."

Learning Activities - Lack of Choice for Schedule or Approach

Feedback from the Learning Activities category shared a similar theme due to the heavily scheduled nature of a call center environment, which constrained the learner's ability to choose how best to learn. Participant C said:

> I arrange my self-paced learning routines? This assumes I have authority over my schedule. I don't get to decide to take time to learn something new. I would love it

> if I was allowed time in my schedule to let me decide when I need a few moments to learn something new. Sometimes I need to learn on the fly while I am doing something.

Not all participants felt the SDL approaches benefitted their ability to learn the material effectively. The employees' desire to learn the material well drove which learning strategies and activities might serve their needs best. Participant H said:

> I always learn better when in a group with an instructor than if I have to teach myself. While I do learn the material, the results are not as good as they would be if I were not teaching myself.

Evaluation - Lack of Reflection

Feedback from the Evaluation category shared that the employees frequently did not have the opportunity to evaluate their learning and make adjustments as normally needed to support SDL. This perspective was reflected in the following comment from Participant D: "As call volumes increase, I am not as able to reflect or to track my learning as much as I would like to."

Interpersonal Skills - Trainer Interaction Valued

Feedback from the Interpersonal skills category shared that the majority of employees expressed the need to interact with peers and trainers in order to clarify the learning expectations from the self-paced training program. Participants valued discussion with trainers to ensure accuracy and understanding of the detailed training content. Participant E best illustrated the employees' perspective: "We do use self-directed learning frequently. I am a bit of a procrastinator so pretty unorganized when it

comes to self-directed. I find it works best in tandem with Question-and-Answer sessions with trainers."

Adaptive Learning Strategies

In order to investigate whether the adaptive learning intervention showed any impact to the participant's learning results, the researcher analyzed the qualitative responses to the SRSSDL survey and the quantitative results gathered from course test scores. The quantitative results are discussed in Hypothesis One. The research question focused on the participants' perceptions of adaptive learning and how the training technique aided their learning experience.

Research Question Two

Research Question 2: To what extent did the adaptive training intervention impact learner outcomes?

Feedback collected from the survey results of the Self-Rated Scale for Self-Directed Learning (SRSSDL) survey instrument was analyzed using qualitative methods to explore themes described by the learner's experience with adaptive training interventions. Two themes emerged from the feedback collected from participant surveys specific to the adaptive learning intervention. Overall, the themes revealed increased knowledge retention and reduced additional assistance.

Adaptive Learning Techniques - Improved Knowledge Retention

Responsive and adaptive learning techniques implemented during training helped to accelerate the learner's knowledge retention. Participant F said, "In my opinion, interactive, adaptive learning as related to learning methods improve engagement and speed up the learning process as well as increase retention of knowledge."

Adaptive Learning Techniques - Reduced Assist Line Support

Further, participants described that the addition of facilitated sessions to support the SDL activities reduced the need to reach out for additional assistance once the employees transitioned back to their jobs after training. Participant G commented: "Trainers and facilitators are a great addition to learning a topic because they are able to answer questions ahead of time and eliminate calls to the assist line once we start handling the new topic."

Overall, the participants stated that the support provided by the adaptive intervention provided value to their learning experience by increased engagement, reducing questions on the job, providing answers to speed up the learning process overall and increasing knowledge retention, which directly applied to job performance as a call center employee.

Additional data gathered from the quantitative analysis to explore the relationship between the adaptive learning intervention and the course test scores will be discussed further for hypothesis one in the following section.

Learner readiness and impact on the job were observed. Though the question regarding extent of learner readiness was not directly asked within the SRSSDL survey about participants' SDL readiness and their abilities to apply new knowledge on the job, a theme emerged in the feedback which indicated the employees' dedication to learning even outside their work environment in order to be effective on the job.

Research Question Three

Research Question 3: To what extent did learner readiness impact the employee's ability to apply their new knowledge on the job? To determine learner

readiness and the employees' abilities to apply new training back on the job and the influence of their SDL readiness score on proficiency, the researcher explored the participants' perceptions and qualitative responses gathered from the SRSSDL survey.

Readiness Impact - Continuous Learning Required

Participant feedback showed dedicated and self-directed effort in order to properly prepare to apply learning on the job. Participant B said:

> A separate time and routine is a must to truly understand a new topic. We shouldn't be expected to learn and sound confident to branches after reading tons of material within a brief read time. I personally always have to use my own personal time after work or weekends to truly dig deep into the training material.

As expressed in Participant B's comment, 17% of the participants described pursuing additional, dedicated learning time outside of normal training time to be effective on the job. As referenced by Williamson (2007) in her study on nurse training, continued learning outside of normal training schedule was a critical self-directed skill to support employee success regardless of job or industry.

Readiness Impact - Conflicted View Toward Continuous Learning

However, an emerging conflicted theme from participant comments showed that 21% of employees felt that the training should be provided within their work day and they should not be expected to study outside of work hours, as indicated by Participant I:

> As it regards learning for my job, I do my best to keep up on the knowledge that I am responsible for. I however do not feel that I should be required to do this after

hours as I have other commitments. I am a big fan of learning outside of this job. I do what I have to, to keep current on my topic during the work day.

The themes represented by these comments indicated a tension created in the contact center training environment, which competed with learner perception of readiness and the SDL approach used to support a successful cross-training program for the contact center employees.

To further explore the acquisition of new knowledge applied on the job, the quantitative analysis conducted for hypotheses three, four, and five provided specific insight to employee performance on the job using traditional contact center metrics to evaluate employee performance. Using both qualitative and quantitative data to support the mixed-methods analysis of possible impact of SDL attributes on employee performance provided a robust view of the learner's experience.

Quantitative Analyses through Null Hypotheses

As part of the research investigating Self-Directed Learner Readiness, the SRSSDL scores and participant test scores were gathered from the learning management system. Quantitative analysis was conducted to determine if there was a measurable impact and relationship to the adaptive learning interventions the employees participated in during the training program.

Null Hypothesis One

To investigate the employees' learner readiness and the possible impact on the participants final test scores, depending upon whether the employee participated in an adaptive training experience or not, the final course test scores were sorted by adaptive or not adaptive intervention and then analyzed to determine if a difference

existed between the participants' self-rated self-directed learner (SRSSDL) scores. The results are shown in Table 4.

Null Hypothesis 1: There was no difference between the Self-Rated Survey Self-Directed Learning (SRSSDL) scores for employees that took the adaptive learning intervention and those that did not participate in the adaptive learning activities.

Table 4

Adaptive Learning Intervention and Non-Adaptive Experience Compared

Group	M	SD	df	t	p
Adaptive	237.35	24.40	97	54.11	< .001
Non-adaptive	229.44	28.05	33	27.82	< .001

A *t*-test of two independent means was conducted to determine if participants who attended the adaptive sessions had higher SRSSDL scores than participants who had not attended the adaptive sessions prior to starting their service training program. Alpha was .05. A preliminary test of variances revealed that the variances were not equal. The mean of the adaptive scores was significantly higher than the non-adaptive scores. The analysis revealed that the adaptive scores for the 98 participants (M = 237.35, SD = 24.404) were higher than those of the 34 Non-adaptive participants (M = 229.44, SD = 28.05); df: 33, $t(27.82)$, $p = < .001$. The null hypothesis was rejected since the data revealed differences in the scores. The researcher concluded that the participants who attended the adaptive training sessions prior to training had statistically higher SRSSDL scores than the

participants who did not attend the adaptive training sessions. Thus, the adaptive training intervention positively impacted the employees' self-directed learner outcomes.

Null Hypothesis Two

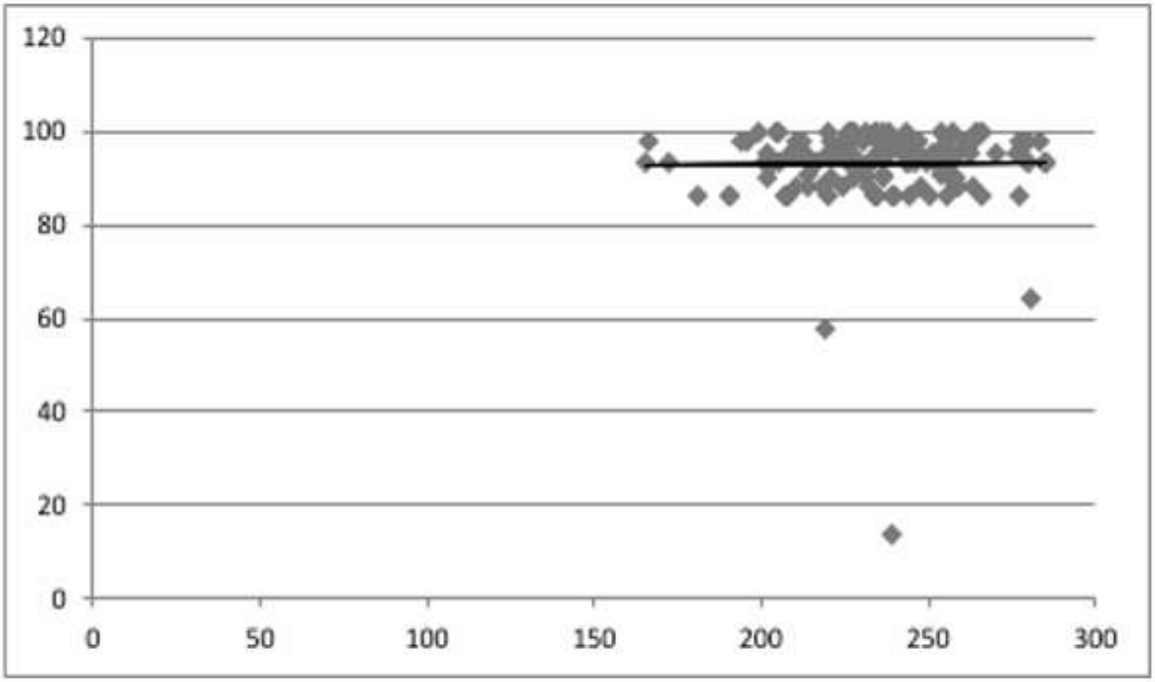
To investigate the employees' learner readiness and the possible impact on the participants test scores, the final course test scores and the participants' self-rated self-directed learner (SRSSDL) scores were analyzed.

Null Hypothesis 2: There was no relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and course test scores.

In order to test whether or not there was a relationship between the participants' SRSSDL scores and their course test scores, the researcher ran the PPMCC and *t*-test. The analysis showed that the correlation coefficient ($r = 0.009$) was not significant; $t(0.10) = 130$, $p = 0.918$. Thus, the researcher failed to reject the null hypothesis and concluded that the participants' core test scores and SRSSDL scores were not related.

Figure 9

SRSSDL Scores and Core Course Test Score Compared Using Pearson ρ Correlation Coefficient



Note. N=132; *r*=0.009; *p*=0.918

Null Hypothesis Three

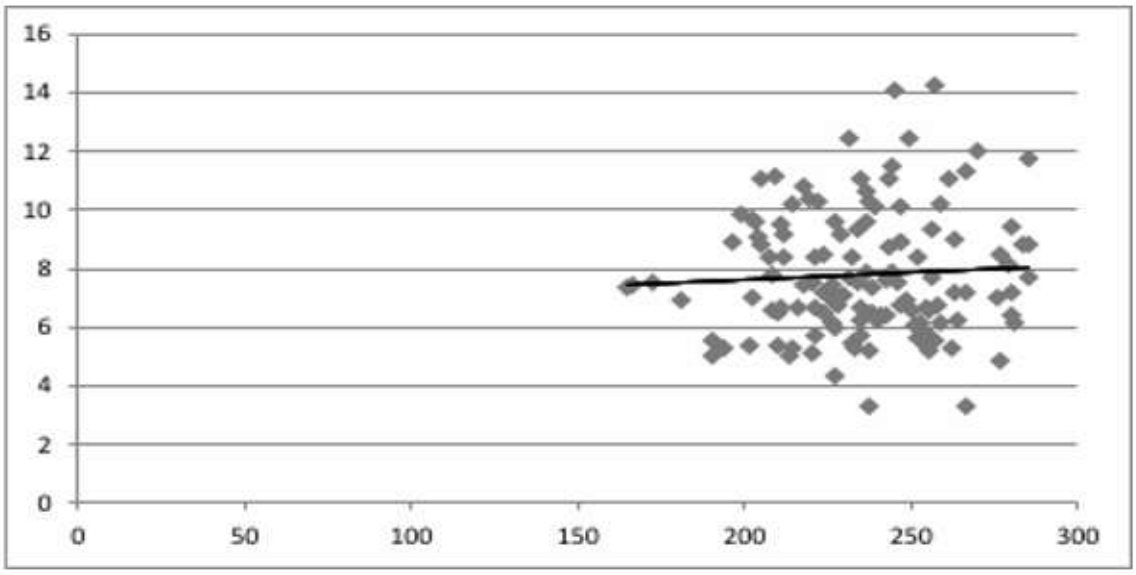
To investigate the employees' learner readiness and the possible impact on the participant's Average Handle Time (AHT), the AHT scores and the participants' self-rated self-directed learner (SRSSDL) scores were analyzed.

Null Hypothesis 3: There was no relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Average Handle Time (AHT) scores.

In order to test whether or not there was a relationship between the participants' SRSSDL scores and their Average Handle Time (AHT) score, the researcher ran the PPMCC and *t*-test.

As shown in Figure 10, the analysis showed that the correlation coefficient (r = 0.062) was not significant; $t(0.71) = 130$, $p = 0.480$. Thus, the researcher failed to reject the null hypothesis and concluded that the data showed that the participants' Average Handle Time (AHT) scores and SRSSDL scores were not related.

Figure 10



Note. N=132; r=0.062; p=0.480 AHT is Average Handle Time. Employee performance is expected to reduce the time to handle calls. As proficiency increased, handle time decreased.

Null Hypothesis Four

To investigate the employee's learner readiness and the possible impact on the participant's Repeat Call Back (RCB), the RCB scores and the participant's self-rated self-directed learner (SRSSDL) scores were analyzed.

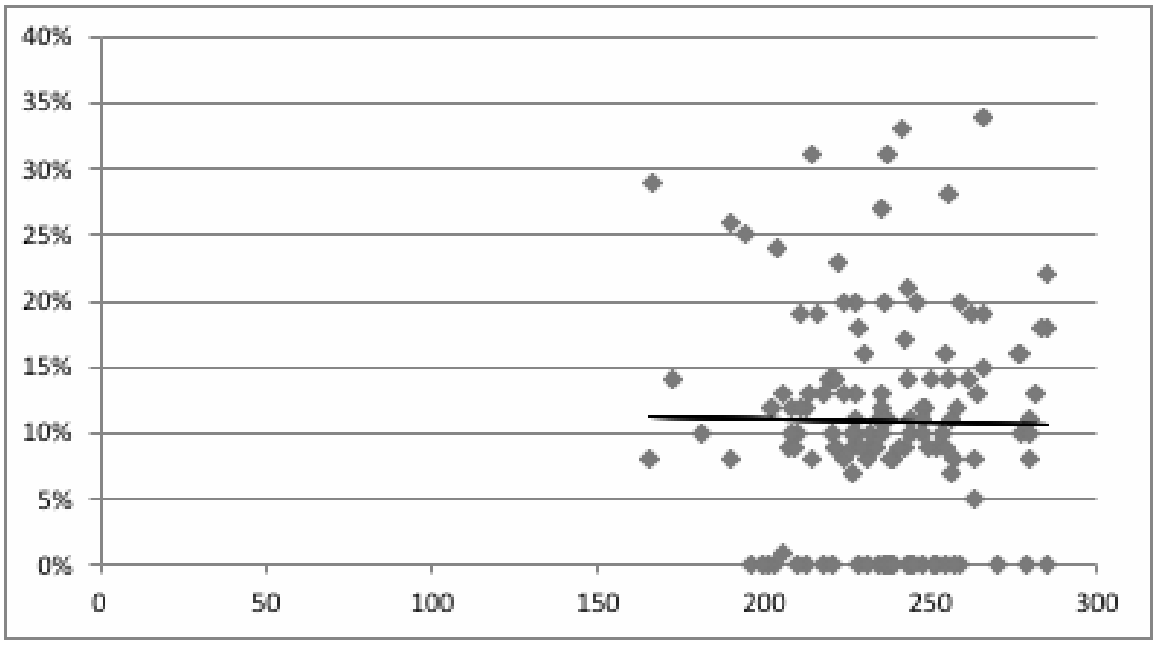
Null Hypothesis 4: There was no relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Repeat Call-Back (RCB) scores.

In order to test whether or not there was a relationship between the participants'

SRSSDL scores and their Repeat Call Back (RCB) scores, the researcher ran the PPMCC and *t*-test. As shown in Figure 11, the analysis showed that the correlation coefficient (r = -0.017) was not significant; $t(-0.19) = 130$, $p = 0.847$. Thus, the researcher failed to reject the null hypothesis and concluded that the data showed that the participants' Repeat Call Back (RCB) scores and SRSSDL scores were not related.

Figure 11

SRSSDL Scores and RCB compared



Note. RCB is Repeat Call Back. Employee performance is expected to reduce the number of call backs. As proficiency increased, repeat calls decreased. *N=132; r= -0.017; p=0.847*

Null Hypothesis Five

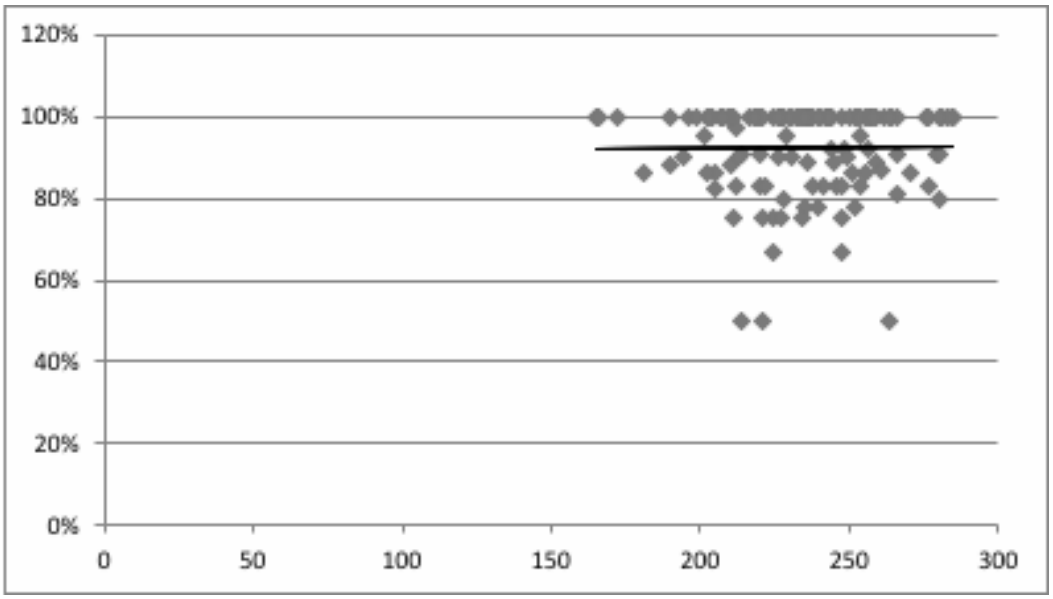
To investigate the employees' learner readiness and the possible impact on the participant's Branch View Score (BVS) score, the BVS scores and the participants' self-rated self-directed learner (SRSSDL) scores were analyzed.

Null Hypothesis 5: There was no relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Branch View Scores (BVS).

In order to test whether or not there was a relationship between the participants' SRSSDL score and their Branch View Score (BVS) scores, the researcher ran the PPMCC and *t*-test. As shown in Figure 12, the analysis showed that the correlation coefficient ($r = 0.007$) was not significant; $t(0.08) = 130$, $p = 0.937$. Thus, the researcher failed to reject the null hypothesis and concluded that the data showed that the participants' Branch View Score (BVS) scores and SRSSDL scores were not related.

Figure 12

SRSSDL Scores and BVS Scores Compared



Note. N=132; *r*= -0.007; *p*=0.937

Summary

Chapter Four discussed the results of the qualitative and quantitative data collected by the researcher to conduct a mixed-methods analysis to investigate the relationship and possible impact of SDL attributes on employees' performance back on

the job. The study specifically focused on call center employees who had participated in a new cross training program that utilized adaptive and SDL techniques.

The researcher used qualitative methods to explore themes provided by feedback gathered from the SRSSDL survey instrument, which was distributed via work email to employees, and data collected using *Qualtrics*. The qualitative results showed that several themes emerged focused on the tension between the work environment constraints competing with the employees' desire to direct their own learning strategies and activities. Additional themes revealed the effectiveness of the adaptive learning intervention which was also supported by the *t*-test of two independent means, which confirmed a difference between learners' efficacy for learners who experienced the adaptive intervention and those who did not. The quantitative analysis showed that the *p*-value was >.001 and the null hypothesis was rejected, since there was a difference in mean scores. The adaptive intervention mean scores were higher than the non-adaptive mean scores, which indicated that there was a relationship between higher SRSSDL scores and the higher adaptive learning scores.

Quantitative analysis using the PPMCC was conducted to determine if there was a relationship between the SRSSDL score and the final test scores. The researcher failed to reject the null hypothesis and a relationship was not indicated. Quantitative analysis using the PPMCC was conducted to determine if there was a relationship between the SRSSDL score and the three business efficiency metrics. The researcher failed to reject the null hypothesis for the Average Handle Time (AHT), Repeat Call Backs (RCB), and Branch View Scores (BVS) and a relationship was not indicated for each metric.

Chapter Five will discuss the research findings, the nuances and implied impact of SDL on business efficiency metrics, and recommendations for further research to support deeper understanding of contact center training and the constraints within the service department.

Chapter Five: Summary and Conclusions

This study investigated the presence of self-directed learner attributes and determined whether there was an impact to the employees' course test scores, behavior change following adaptive learning interventions, and improved performance on the job after training through the analysis of business efficiency metrics. Chapter Five reviewed the findings and connected the qualitative themes and quantitative trends to existing literature on andragogical principles, adaptive learning strategies, and self-directed learner readiness. Unexpected outcomes and recommendations for future research were discussed.

Throughout the literature, industry leaders and training managers explored various ways to prepare employees to embrace change and continuously learn and adapt to new demands at work (Bersin, 2017; Deloitte, 2017). Much of the literature suggested that SDL and the need to drive one's own development and skill development extended beyond the initial training program. Andragogical principles reinforced the adult learners' need to tie learning outcomes directly to the employees' goal for relevant training to upskill their abilities. Now more than ever various industries, such as science, technology, and the medical field recognized the importance of creating a continuous-learning work environment to support developing skilled workers and to help these employees meet the needs of a continuously evolving business environment (Aljafari, 2019). Training managers explored adaptive learning techniques to enhance learning, while SDL techniques were implemented to accelerate learning results (Antonsen et al., 2010; Howe, 2018; Lynch, 2019). Learner readiness, self-directed attributes, and adaptive

training techniques were themes reflected increasingly throughout multiple business and educational environments.

The impact of change on the contact center employees and their ability to learn continued to influence the learner's ability to increase their knowledge and skills. Participants' comments reflected the struggles they experienced in trying to complete the training without appropriate support and their frustration caused by adjusting to constant change. Though the participants recognized their need to develop SDL attributes, they also felt the environment did not provide time and support to learn and grow. In addition to reviewing the subjective feedback of the participants' perceptions of their learning experiences through comments, business performance data were also analyzed as part of the mixed-methods analysis to evaluate objective performance metrics. While no statistically significant relationship was observed in the results of the business efficiency metrics described in hypothesis three and hypothesis four, the linear regression data clustering revealed a significant relationship for reduced handle time and reduced repeat call backs. These call handling reductions were desired behaviors in service center performance tracking.

The research questions and hypotheses considered in this study were:

Research Question 1: What self-directed learner readiness attributes were evident in the call center population?

Research Question 2: To what extent did the adaptive training intervention impact learner outcomes?

Research Question 3: To what extent did learner readiness impact the employee's ability to apply their new knowledge on the job?

Alternate Hypothesis 1: There was a difference between the Self-Rated Survey Self-Directed Learning (SRSSDL) readiness score and the adaptive training approach.

Alternate Hypothesis 2: There was a relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and course final test scores.

Alternate Hypothesis 3: There was a relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and Average Handle Time (AHT) scores.

Alternate Hypothesis 4: There was a relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Repeat Call-Back (RCB) scores.

Alternate Hypothesis 5: There was a relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Branch View Scores (BVS).

Discussion of Findings

This study investigated the listed three research questions and five hypotheses about self-directed learner readiness and adaptive learning techniques used within a Service Training environment for call center employees. Since the researcher worked as a Learning Strategist within the training department, the researcher's reflexivity enabled her to dig more deeply into the data to identify relationships revealed regarding learner attributes and the adaptive learning strategies used within the training program. The insights revealed from the research were used to inform and support enhanced decisions for future training program development (Creswell & Creswell, 2018).

As this was a mixed-methods research study, the research questions and alternative hypotheses were interwoven to reinforce both quantitative and qualitative

analyses and perspectives. Research question one findings focused on determining how participants perceived their learner readiness and identified which attributes existed in the participant population. Research question two and the associated hypothesis one focused on the adaptive learning elements of the program and the participants' perceptions of value from adaptive interventions, as well as impact to their SDL readiness. Hypothesis two findings focused on determining whether a relationship existed between the SDL readiness score and the learners' final test scores. Research question three findings focused on how the learner readiness score indicated an impact on skills applied on the job. Hypotheses three, four, and five findings focused specifically on the SDL score and the influence of the participants' readiness scores on the three business efficiency metrics (AHT, RCB, BVS) used within the service department to evaluate employee job performance.

Research Questions and Alternative Hypotheses Summarized

Research Question 1: What self-directed learner readiness attributes were evident in the call center population?

Participants responded to the SRSSDL survey to determine their self-reported perception of their SDL readiness. The mean score was 235.5 indicating a high range of self-directed learner readiness for the employees who participated in the study. Originally, the premise anticipated by the researcher was that the participants would score much lower on the distribution bell curve, due to their lack of readiness for learning in a self-directed manner. The SRSSDL survey gathered data regarding five specific self-directed learner attributes. The five categories included: awareness, learning strategies, learning activities, evaluation, and interpersonal skills. Participants were aware of their

own learning needs and eager to determine learning strategies to increase their skill and knowledge. However, comments reflected that the learning environment competed with the employees' abilities to choose effective learning strategies. Interpersonal skill was ranked as their third highest attribute, which aligned to the expected behaviors for a call center employee.

Research Question 2: To what extent did the adaptive training intervention impact learner outcomes?

Overall, the participants stated through survey comments that the support provided by the adaptive intervention provided value to their learning experience through increasing learner engagement, reducing questions on the job, providing answers to speed up the learning process overall, and increasing knowledge retention, which directly applied to job performance for the call center employee. To further explore the impact of the adaptive training intervention using a non-subjective approach, quantitative data gathered through test scores was also analyzed and was described through hypothesis one.

Alternate Hypothesis 1: There was a difference between the Self-Rated Survey Self-Directed Learning (SRSSDL) readiness score and the adaptive training approach.

A *t*-test of two independent means was conducted to determine if participants who attended the adaptive sessions had higher SRSSDL scores than participants who had not attended the adaptive sessions as part of their service training program. Since the mean of the adaptive scores was significantly higher than the non-adaptive scores, the researcher

concluded that the adaptive training intervention positively impacted the employee's self-directed learner outcomes.

Research Question 3: To what extent did learner readiness impact the employee's ability to apply their new knowledge on the job?

As expressed through participants' comments, the theme of independent learning was reflected by 17% of the participants who described pursuing additional, dedicated learning time outside of their normal work shift to be effective on the job. As referenced by Williamson (2007) continued learning outside of normal training schedule was a critical self-directed skill to support employee success regardless of job or industry. In contrast, another emerging theme from participant comments showed 21% of the employees felt that training should be provided within their work shift and they should not be expected to study outside of work hours to gain the skills needed to do their jobs.

Alternate Hypothesis 2: There was a relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and course final test scores.

The Pearson Product Moment Correlation Coefficient (PPMCC) and *t*-test was run to determine whether a relationship between the final test score and the SRSSDL scores existed. The analysis showed that the correlation coefficient was not significant. Thus, the researcher rejected the alternative hypothesis and concluded that the participants' core test scores and SRSSDL scores were not related.

Alternate Hypothesis 3: There was a relationship between the Self-Rated Survey Self-Directed Learning (SRSSDL) score and Average Handle Time (AHT) scores.

The analysis showed that the correlation coefficient was not significant. Thus, the researcher rejected the alternative hypothesis and concluded that the participants' business efficiency metrics for Average Handle Time (AHT) and the SRSSDL scores were not related.

Alternate Hypothesis 4: There was a relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Repeat Call-Back (RCB) scores.

The analysis showed that the correlation coefficient was not significant. Thus, the researcher rejected the alternative hypothesis and concluded that the participants' business efficiency metrics for Reduced Call Back (RCB) and the SRSSDL scores were not related.

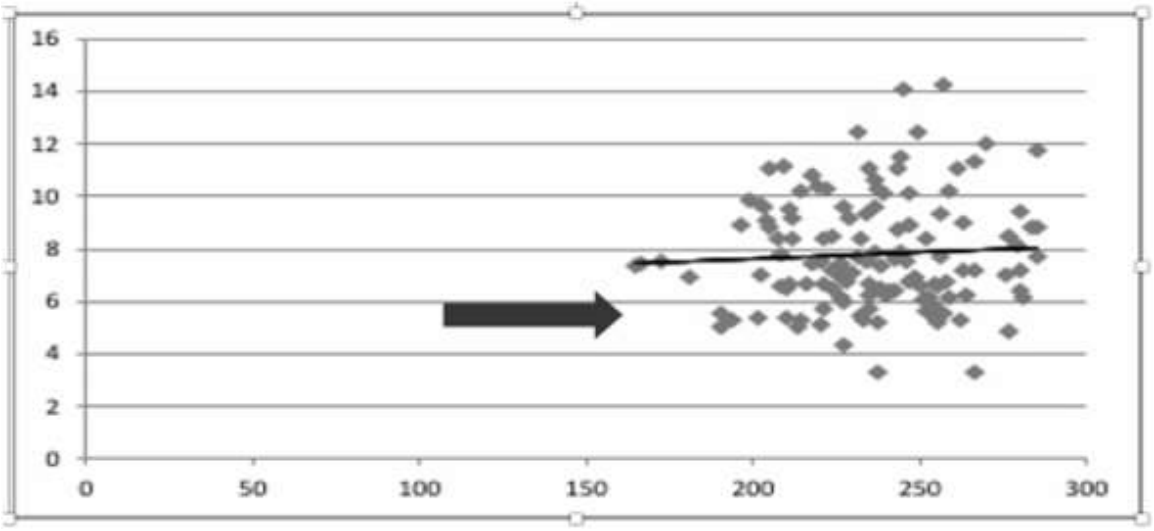
Alternate Hypothesis 5: There was a relationship between Self-Rated Survey Self-Directed Learning (SRSSDL) score and Branch View Scores (BVS).

The analysis showed that the correlation coefficient was not significant. Thus, the researcher rejected the alternative hypothesis and concluded that the participants' business efficiency metrics for Branch View Score (BVS) and the SRSSDL scores were not related.

As previously stated, the Pearson Product Moment Correlation Coefficient (PPMCC) and *t*-test was run to determine whether a relationship between each of the three business efficiency metrics and the SRSSDL scores existed. Each alternative hypothesis was rejected. However, while no statistically significant relationship was observed in the business efficiency metrics described in hypothesis three and hypothesis four, the linear regression data clusters suggested a significant relationship for reduced handle time and reduced repeat call backs for many participants. The clustering shown in

Figure 13 and Figure 14 suggested that further analysis of learner subgroups would be recommended since the reductions in the average handle time (AHT) and the repeat call back (RCB) behaviors represented desired proficiency in call center employee performance.

Figure 13



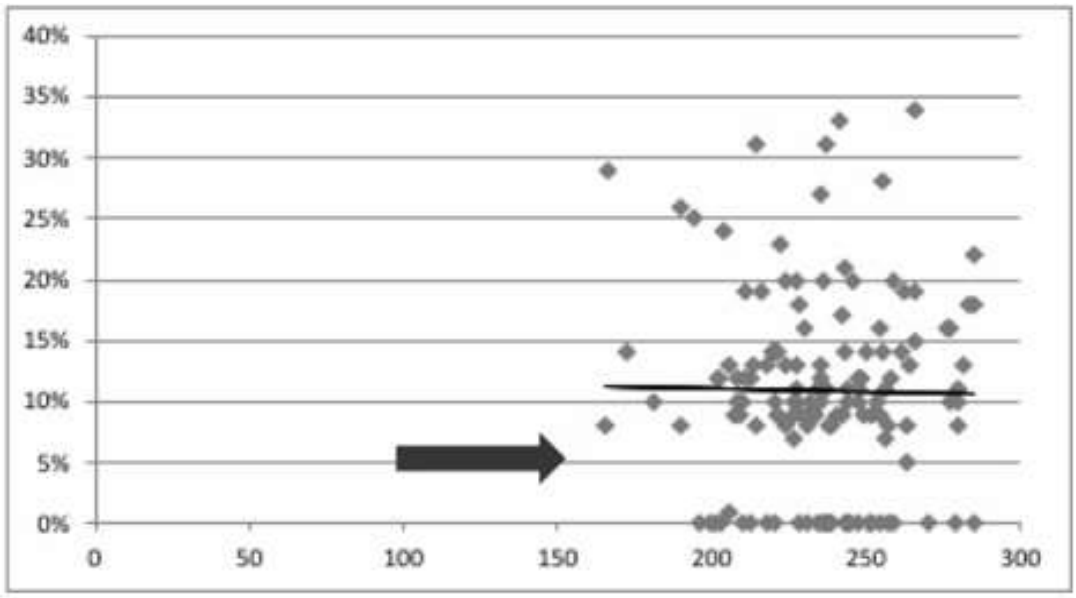
Note. N=132; *r*=0.062; *p*=0.480 AHT is Average Handle Time. Employee performance was expected to reduce the time to handle calls. As proficiency increased, handle time decreased.

Initial investigation showed that the desired performance was achieved by the majority of participants. As shown in the clustered scores in Figure 13 for Hypothesis 3 and Figure 14 for Hypothesis 4, the higher SRSSDL scores showed a majority of participants with reduced Average Handle Time (AHT) lower than eight minutes (which was a desired performance metric) and Reduced Call Back (RCB), which was the desired performance for a contact center employee's proficiency. In other words, a 10% increase in SDL scores demonstrated better performance on the job. Contact Center employees

were able to handle the calls more efficiently and in reduced time while providing more accurate and complete answers which reduced the amount of call backs.

Figure 14

SRSSDL Scores and RCB Compared Showing Clustered Proficiency



Note. RCB is Repeat Call Back. Employee performance was expected to reduce the number of call backs. As proficiency increased, repeat calls decreased. *N=132; r= -0.017; p=0.847*

Deeper analysis of the Branch View Score (BVS) scores showed limited response data making the results not statistically significant to demonstrate a valid trend.

Reflection on the Study

The researcher's original premise was that the learners were not comfortable with a SDL approach and were thrown into this new learning scenario with little preparation. The training style was mismatched to their learning needs. However, most participants rated themselves high scoring self-directed learners in the SRSSDL survey. The participants' qualitative comments reflected their disappointment in the learning

approach used as the participants' readiness to learn was not aligned to the training approach deployed. Feedback was specific to the self-directed nature of delivery versus receiving direct instruction. When learners received adaptive interventions such as trainer supported sessions with live question and answer segments, the learner's comfort and comments reflected higher engagement with the learning. The mismatch theme described in Grow's (1996) SDL model as seen in Figure 15 represented an example of alignment of the training strategy to learner needs, which was an important component for successful training programs.

Grow (1996) further stated that a mismatch occurred when the teaching techniques and the learner's readiness were not matched appropriately as shown in Figure 16. Due to the nature of the call center work, a more directive teaching approach was preferred as these employees were dependent learners. Grow further explained that learners became easily frustrated when the method did not match their need. The mismatch in learners' needs and training methods was evident in the participants' survey comments in regard to their learning strategies, learning activities and overall awareness.

Figure 15

Grow's (1996) Staged Self-directed Learning Model

Note.

Stage	Student	Teacher	Examples
			Coaching with immediate feedback
		Authority	Drill and practice
			Informational lecture
Stage 1	Dependent	Coach	Overcoming deficiencies and resistance
		Motivator	Inspiring lecture plus guided discussion
Stage 2	Interested	Guide	Goal setting and learning strategies
			Discussion facilitated by teacher who participates as equal
		Facilitator	Seminar
Stage 3	Involved	Moderator	Group projects
			Internship
		Consultant	Dissertation - applied research*
			Work - applied theories*
			Exploration
Stage 4	Self-Directed	Delegator	Self-directed study group

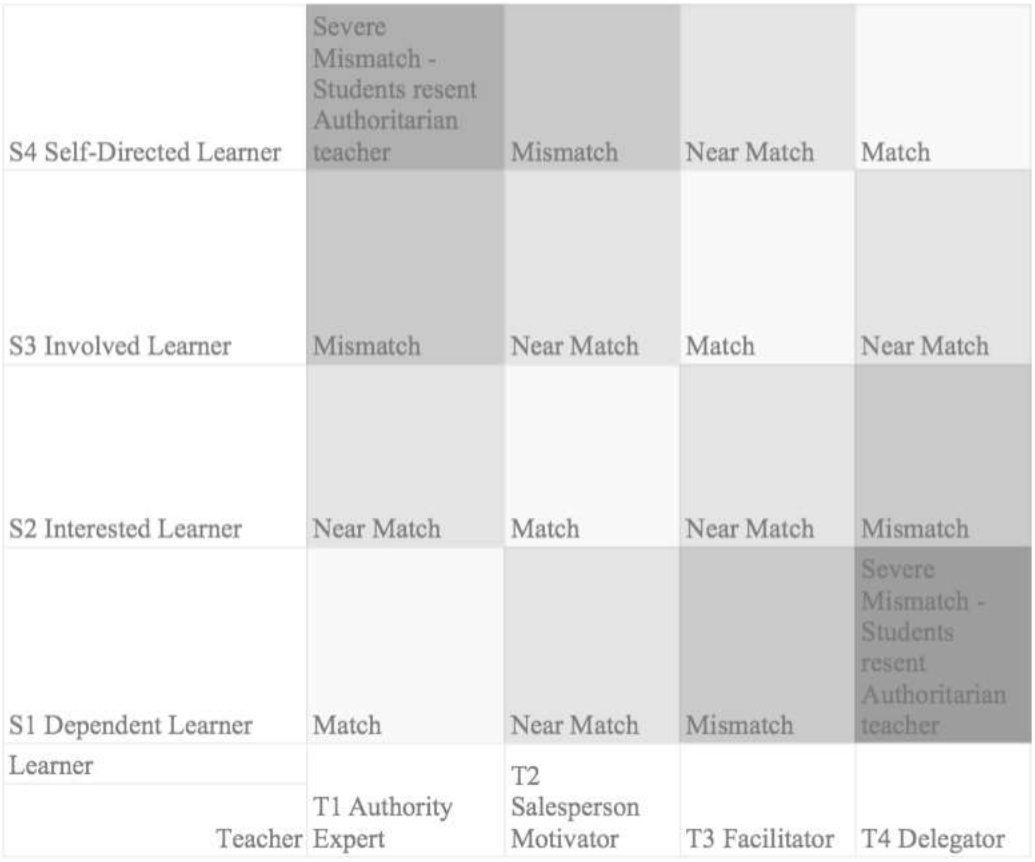
Participants in the call center work environment need direct instruction to answer inquiries accurately, timely, and confidently. Their proficiency directly impacted Average Handle Time (AHT), Repeated Call Backs (RCB), and Branch View Scores (BVS), as adapted from Grow (1996).

As shown in Figure 16, Grow's (1996) Staged Self-Directed Learning model, demonstrated the S1 and T4 mismatch reflected in the call center employee's comments regarding frustration in learning content without proper guidance and teacher support. As Grow (1996) eloquently stated, "The most severe problems occur when dependent learners are mismatched with non-directive teachers and when self-directed learners are mismatched with directive teachers" (p.137). The misalignment between needs and methods led the learners to resent the training as they were not ready for freedom when learning new content as their desire for greater guidance indicated more dependent

learning needs. The researcher observed that participants' most frequent emerging theme was a desire to receive direct instruction on specific skills, such as answering questions accurately rather than to choose topics freely. Without direct guidance, employees worried there would be gaps in their knowledge and mistakes might arise when handling calls.

Figure 16

Match and Mismatch Between Learner Stages and Teacher Styles



Note. Call center participants shared feedback about frustration with the work environment which did not provide direct instruction when needed nor choice in choosing activities, as adapted from Grow (1996).

The hypotheses proposed that specific self-directed learner attributes would be evident in the survey results and that the secondary data would show a positive relationship between higher self-directed learner attributes and higher test scores. The data from the surveys, the test scores, and the three business efficiency metrics captured by the company to monitor performance was used to investigate how the variables impacted employee learning in a SDL context. To analyze the employees' learner readiness and the possible impact on the participants' test scores, the premise that higher SRSSDL scores would suggest higher test scores was explored. Further investigation of the test passing methods allowed within the training department revealed that the participants were allowed to take the test several times until they passed with a suitable score. Multiple test-taking procedures clouded the ability to investigate correlation and relationship between the SRSSDL scores and the final course test scores due to the multiple test attempts not being factored into the quantitative analysis used in this study.

Another theme from the participants' feedback emphasized the stressors caused by constant and evolving change within business training environments. The pressure to perform, to stay ahead of innovation and change, and the time required to learn effectively competed with the normal workday effectiveness. The need to continually learn throughout one's career is imperative to adapt to change and to remain effective (Bersin, 2017; Gugilelmino, 2013; Siefert et al., 2016).

Readiness to Learn

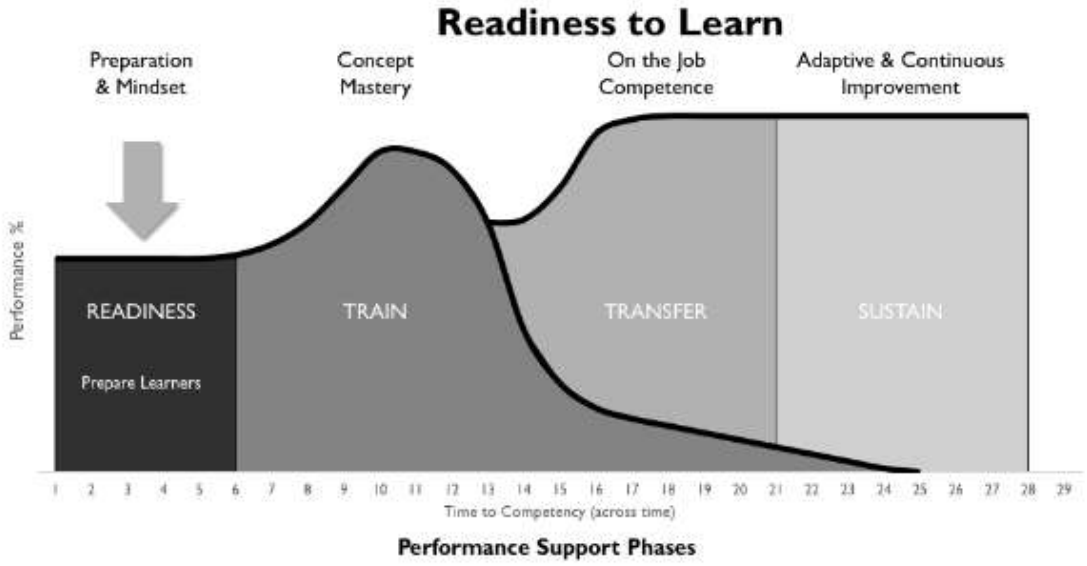
The researcher learned there was limited research in the call center industry regarding learner readiness and adaptive learning interventions. Learning and Development professionals will benefit from a better understanding of learner readiness

in order to assist training departments in the creation of meaningful training experiences for employees in a workplace environment. In research specific to nursing students, enabling learners to gain insight into their own learning characteristics increased learning efficacy over the four-year college experience (Williamson, 2007). Since self-directed learner readiness was being explored in multiple business and science industry contexts, further research specific to the call center environment would be beneficial.

Another theme reflected in the participant feedback indicated that the new learning approach was not supported by readiness activities, which prepared the learner to be receptive and trusting in the new learning environment. As shown in Figure 17, Gottfredson and Mosher (2012) illustrated the performance support phases that encouraged learner performance in a job training environment. The first stage of readiness was missing from the new self-directed learner program, leaving the participants to determine how to progress on their own with little guidance or support. The lack of preparedness and readiness left a gap in the mindset of the learners and increased the learner's struggle through training. A participant's readiness to learn needed to be supported by all four phases in the model, starting with the readiness stage. Connecting readiness through the training stage, and the application of knowledge transfer to on-the-job competence would support training impact. When participants needed reinforcement then adaptive and continuous improvement activities would be made available through the sustain stage (Gottfredson & Mosher, 2012). Providing these four stages to support learner readiness would strengthen the training program effectiveness overall.

Figure 17

Readiness to Learn



Note. Adapted from Gottfredson and Mosher (2012). Printed with permission.

Recommendations for Future Research

The researcher found ample research focused on SDL in both education and corporate training departments but limited research on contact center environments. Of the 214 articles reviewed, 124 of which were cited in the dissertation, only six articles were specific to contact center training. The six articles did not specifically focus on SDL attributes nor adaptive learning within the service environment.

The research and findings of the study provided an opportunity for training professionals to consider the implication of leveraging adaptive learning strategies (Howe, 2018; Pugliese, 2016), paired with andragogical principles (Henschke, 2016b), and targeted development of self-directed learner attributes (Raemdonck et al., 2017) to increase the effectiveness of adult learning experiences and to accelerate learning efficacy throughout an employee's career journey (LaDue et al., 2018; Lemmetty et al.,

2020). Thus, the researcher recommends future studies to determine more effective ways to implement adaptive learning programs to support the contact center employee's need for consistent and frequent training.

As employee participants were monitored heavily on business efficiency metrics, despite a low statistical relationship between the participants studied, the linear regression data suggested a correlation may exist in smaller groups. Further research using an analysis of variance (ANOVA) for the multiple groups within the participant population is recommended to better understand the impact and efficacy of employees' learning and application in their business environment.

Additionally, the need to provide continual learning opportunities for the modern employee continues to create tension between being skilled and the need to be reskilled. As technology, business processes, and financial regulations continue to change at a rapid pace, the employees in this type of learning environment need more ways to continue developing their skills in order to contribute successfully in their careers (Cohen, 2017). More research specific to SDL and adaptive learning experiences would benefit this sector of the business world.

Study participants were chosen from a purposive sample from a recent cross-training project in the service training division. However, due to the strict compliance rules governing the corporate training department, only post surveys were used to capture participant learner attribute data. This limitation provided a narrow view of changes to the participants' learning behaviors following various training interventions. Therefore, the researcher recommends future research that includes pre and post surveys to better

understand the participants' readiness to learn prior to training (Cadorin et al., 2017; Shen, 2014; Williamson & Seewoodhary, 2018).

Conclusion

The researcher concluded that adaptive learning interventions supported the overall training program by providing additional information to the dependent learners when they needed help to learn effectively. The presence of several SDL attributes (specifically awareness and learning strategies) were evident in the participant population. Service training department environment required heavily structured training schedules, which conflicted with the notion of SDL and opportunity for a learner to control their learning activities to best meet their needs.

Exploring how to make training relevant and meaningful, determining learner needs, and matching teaching strategies to meet those needs, ensures the learner's ability to apply their knowledge on the job and increases retention. Providing consistent training within the call center environment reduces employee job stress and reinforces skills, which enable employees to cope with constant change. Overall, supporting employees with training by effectively matching teaching techniques to their ability to become self-directed, adaptable, and life-long learners is a critical lever to training success and job performance.

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Appendices

Appendix A: IRB Approval

From: irb@lindenwood.edu <irb@lindenwood.edu>
Sent: Wednesday, February 19, 2020 12:11:15 PM
To: fgiuseffi@lindenwood.edu <fgiuseffi@lindenwood.edu>; SCOTT-MUENTER, MARY (Student) <MSS551@lindenwood0.onmicrosoft.com>
Subject: IRB-20-36 - Initial: Exempt - Approved

Feb 19, 2020 12:11 PM CST

RE:
IRB-20-36: Initial - Investigating Self-Directed Learning and Adult Learner Readiness Attributes in a Call Center Environment

Dear Mary Scott-Muenter,

The study, Investigating Self-Directed Learning and Adult Learner Readiness Attributes in a Call Center Environment, has been Approved as Exempt.

Category: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

The submission was approved on February 19, 2020.

Here are the findings:

IRB Discussion

- In assessing the appropriate Exempt Category for this approval, the IRB has noted that the researcher will have limited initial access to identifiable research data, but will not be subsequently recording those data for analysis purposes in an identifiable way. This IRB application describes a two-stage process, involving an honest broker designated by the entity, after which the PI will only have deidentified data for further analysis process.

Regulatory Determinations

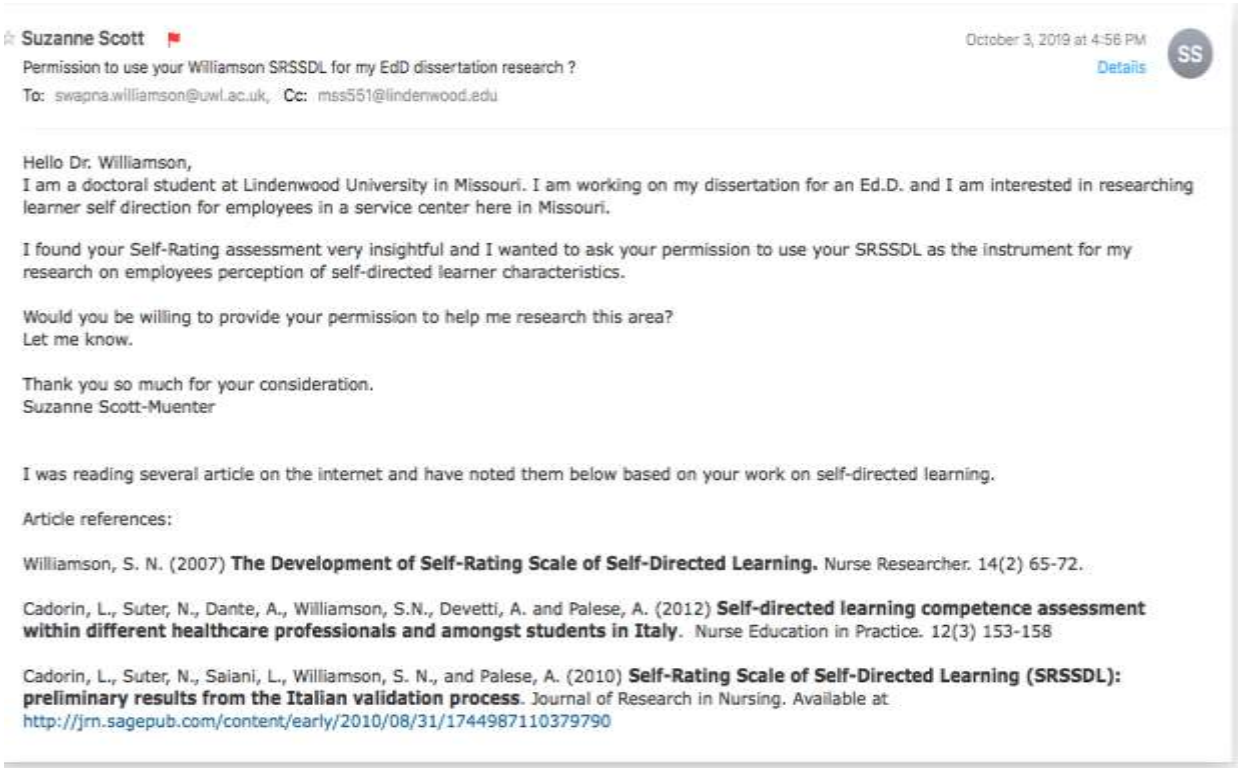
- This study has been determined to be minimal risk because the research is not obtaining data considered sensitive information or performing interventions posing harm greater than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

Sincerely,
Lindenwood University (lindenwood) Institutional Review Board

Appendix B: SRSSDL Permissions

Email approval from Dr. Williamson on 10/7/19 for permission to use the SRSSDL* tool.

*Self-Rated Scale of Self-Directed Learning (survey instrument)



Suzanne Scott

October 3, 2019 at 4:56 PM

Details

Permission to use your Williamson SRSSDL for my EdD dissertation research ?

To: swapna.williamson@uwl.ac.uk, Cc: mss551@lindenwood.edu

Hello Dr. Williamson,
I am a doctoral student at Lindenwood University in Missouri. I am working on my dissertation for an Ed.D. and I am interested in researching learner self direction for employees in a service center here in Missouri.

I found your Self-Rating assessment very insightful and I wanted to ask your permission to use your SRSSDL as the instrument for my research on employees perception of self-directed learner characteristics.

Would you be willing to provide your permission to help me research this area?
Let me know.

Thank you so much for your consideration.
Suzanne Scott-Muenter

I was reading several article on the internet and have noted them below based on your work on self-directed learning.

Article references:

Williamson, S. N. (2007) **The Development of Self-Rating Scale of Self-Directed Learning.** Nurse Researcher. 14(2) 65-72.

Cadorin, L., Suter, N., Dante, A., Williamson, S.N., Devetti, A. and Palese, A. (2012) **Self-directed learning competence assessment within different healthcare professionals and amongst students in Italy**. Nurse Education in Practice. 12(3) 153-158

Cadorin, L., Suter, N., Saiani, L., Williamson, S. N., and Palese, A. (2010) **Self-Rating Scale of Self-Directed Learning (SRSSDL): preliminary results from the Italian validation process**. Journal of Research in Nursing. Available at http://jrn.sagepub.com/content/early/2010/08/31/1744987110379790

Swapna Williamson

October 5, 2019 at 6:23 AM

Re: Permission to use your Williamson SRSSDL for my EdD dissertation research ?

To: Suzanne Scott

New contact info found in this email: Swapna Williamson swapna.williamson@uwl.ac.uk add...

Dear Suzanne,

Thank you for contacting me and expressing your interest to use the SRSSDL for your Ed.D. dissertation.

You may use the SRSSDL but please adhere to the following terms and conditions:

1. Cite the following reference in any report or publication in which the SRSSDL is used:
   Williamson, S.N. (2007). Development of a self-rating scale of self-directed learning. *Nurse Researcher.*14(2) 66-83.
2. Share the results with me so that I can further develop the scale.

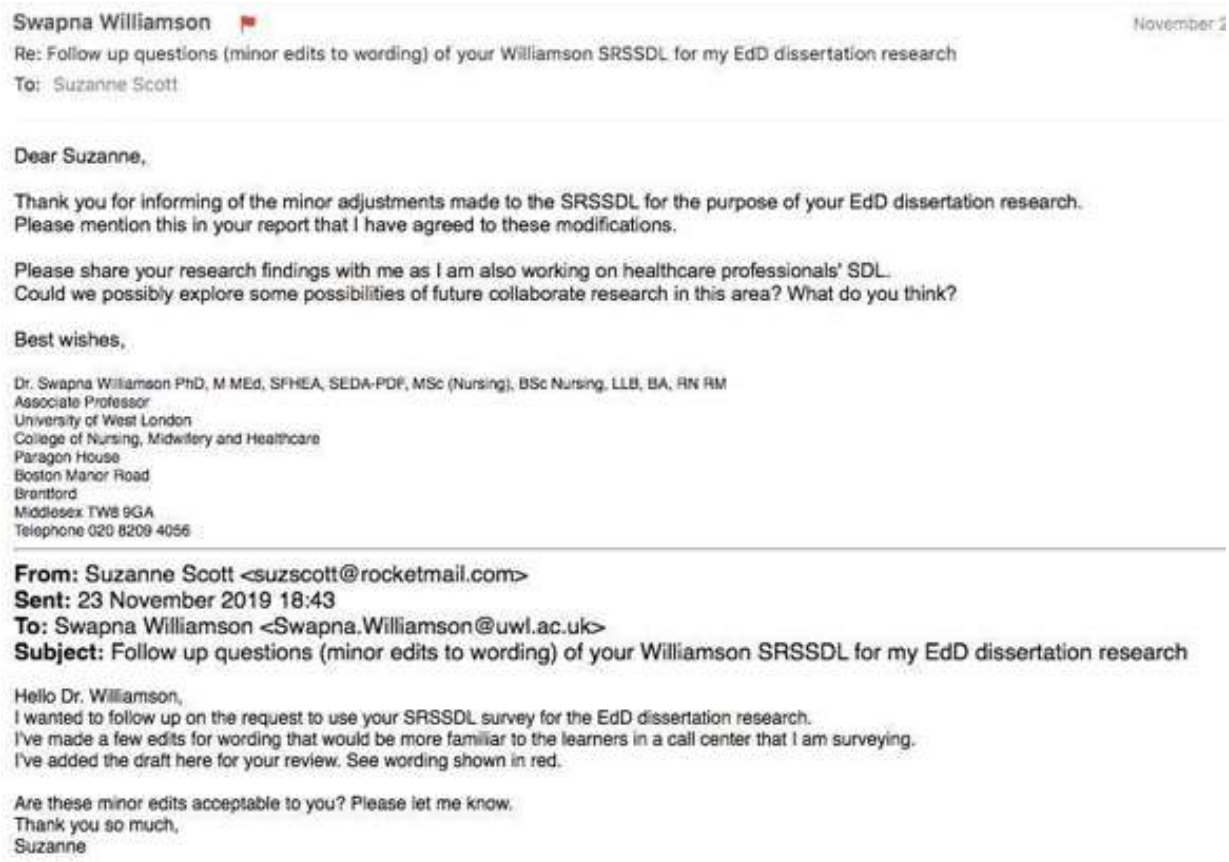
Should you be interested in collaborating to work on employability and self-directed leaning please contact me.

Best wishes,

Dr. Swapna Williamson PhD, M MEd, SFHEA, SEDA-PDF, MSc (Nursing), BSc Nursing, LLB, BA, RN RM
Associate Professor
University of West London
College of Nursing, Midwifery and Healthcare
Paragon House
Boston Manor Road
Brentford
Middlesex TW8 9GA
Telephone 020 8209 4056

See More from Suzanne Scott

Appendix C: SRSSDL Modification Permissions



Swapna Williamson November 2

Re: Follow up questions (minor edits to wording) of your Williamson SRSSDL for my EdD dissertation research

To: Suzanne Scott

Dear Suzanne,

Thank you for informing of the minor adjustments made to the SRSSDL for the purpose of your EdD dissertation research.
Please mention this in your report that I have agreed to these modifications.

Please share your research findings with me as I am also working on healthcare professionals' SDL.
Could we possibly explore some possibilities of future collaborate research in this area? What do you think?

Best wishes,

Dr. Swapna Williamson PhD, M MEd, SFHEA, SEDA-PDF, MSc (Nursing), BSc Nursing, LLB, BA, RN RM
Associate Professor
University of West London
College of Nursing, Midwifery and Healthcare
Paragon House
Boston Manor Road
Brentford
Middlesex TW8 9GA
Telephone 020 8209 4056

From: Suzanne Scott <suzscott@rocketmail.com>
Sent: 23 November 2019 18:43
To: Swapna Williamson <Swapna.Williamson@uwl.ac.uk>
Subject: Follow up questions (minor edits to wording) of your Williamson SRSSDL for my EdD dissertation research

Hello Dr. Williamson,
I wanted to follow up on the request to use your SRSSDL survey for the EdD dissertation research.
I've made a few edits for wording that would be more familiar to the learners in a call center that I am surveying.
I've added the draft here for your review. See wording shown in red.

Are these minor edits acceptable to you? Please let me know.
Thank you so much,
Suzanne

Email approval from Dr. Williamson on 11/29/19 for approval of the modifications to the SRSSDL* tool. *Self-Rated Scale of Self-Directed Learning (survey instrument)

Appendix D: Invitation and Consent Form

Hello Employee,
You are invited to participate in a survey focused on your self-directed learner attributes. The survey should take 12 minutes to complete. The goal of gathering your feedback is to help us better understand your learning needs so we can continue to improve our training. We will be asking 320 other employees to answer these questions.

This survey is voluntary and individual results will be kept confidential, protected and stored internally per corporate policy. Generalized feedback and results will be anonymously recorded and used in further research by Suzanne Scott-Muenter in the Training department in partial fulfillment of her doctoral research (dissertation) on Adult Learning at Lindenwood University.

LINDENWOOD

Research Study Consent Form

Investigating Self-Directed Learning and Adult Learner Readiness Attributes in a Call Center Environment

Before reading this consent form, please know:

- Your decision to participate is your choice
- You will have time to think about the study
- You will be able to withdraw from this study at any time
- You are free to ask questions about the study at any time

After reading this consent form, we hope that you will know:

- Why we are conducting this study
- What you will be required to do
- What are the possible risks and benefits of the study
- What to do if you have questions or concerns during the study

Basic information about this study:

- We are interested in learning about self-directed learner attributes for the purposes of improving your training experiences.
- Your generalized feedback will contribute to research about adult learners.
- You will be asked to complete an online survey with 60 questions about your learning preferences.

What are the risks of this study?
We do not anticipate any risks related to your participation other than those encountered in daily life. You do not need to answer any questions that make you uncomfortable or you can stop taking the survey at any time.
We will do everything we can to protect your privacy. Any information we collect will be stored by the researcher in a secure location within the company firewall. The only people who will be able to see your data are: members of the research team who have signed an Non-Disclosure Agreement with the company.

Will anyone know my identity?
We will be collecting data that could identify you, but each survey response will receive a code so that we will not know who answered each survey. The code connecting you and your data will be destroyed as soon as possible. We do not intend to include any information that could identify you in any publication or presentation.

What are the benefits of this study?
You can benefit from this survey by using your individual results (SDL scores) to enhance your own personal learning strategies. If you are interested in getting your individual report, please answer YES to the question on the survey to indicate your desire to learn more.

As a thank you for your time and participation, employees who complete the survey will be added to a raffle to win a $25 Amazon Gift card. One winner will be chosen from the **completed** surveys.

Your Consent
By selecting, YES in the survey, I confirm that I have read this form and decided that I will participate in the research project described in this email. I have also been given the opportunity to ask questions. I understand the purpose of the study, what I will be required to do, and the risks involved.

I understand that I can discontinue participation at any time by closing the survey browser window. My consent also indicates that I am at least 18 years of age. Please feel free to print a copy of this consent form.

If you have any questions about your rights as a participant in this research or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the Lindenwood University Institutional Review Board Director, Michael Leary, at (636) 949-4730 or mleary@lindenwood.edu.
You can contact the researcher, Suzanne Scott-Muenter, at 650-823-0355 or Dr. Francesco Giuseffi, Lindenwood University Dissertation Chair at 573-253-1611 or fgiuseffi@lindenwood.edu who is overseeing the research project with Suzanne.

Thank you for participating!

Suzanne Scott-Muenter
Learning Strategist
650-823-0355 (cell)

Appendix E: Survey

Self-Directed Learner Readiness Survey (SRSSDLR)

☐ Yes, I agree to participate in this survey and agree to allow my responses to be used in further research for the training department and in a Suzanne's dissertation. I understand that my participation is voluntary and I can opt out at any time.

☐ No Thanks. I decline participation. (Exit survey)

☐ Yes, I would like to receive a report of my individual SDL survey scores.

Demographics:

Education:
Indicate your level of education. Choose all that apply.

☐ High School Diploma or GED

☐ Associate degree (community college)

☐ Technical college (trade school)

☐ College degree

☐ Master's degree

☐ Doctorate degree

Service Experience:
Indicate how long you have been in your current service center role.

☐ Less than 1 year

☐ 1-3 years

☐ 4-9 years

☐ 10+ years

Directions:
Please read and choose the most appropriate response for each statement. Please note that your first reaction to each statement is your most accurate response, therefore, do not spend too long on each item. Your responses will be kept confidential. An 'any other' space is provided for you to add any other issues about self-directedness in learning you find relevant.

Areas of Self-Directedness in Learning (5 -point Likert scale used, will show as a matrix for choices)

Response Key: 5 = Always, 4 = Often, 3 = Sometimes, 2 = Seldom, 1 = Never

1. Awareness

1.1 I identify my own learning needs
1.2 I am able to select the best method for my own learning
1.3 I consider instructors as facilitators of learning rather than providing information only
1.4 I keep up to date on a variety of learning resources
1.5 I am responsible for my own learning
1.6 I am responsible for identifying my areas of deficit
1.7 I am able to maintain self-motivation
1.8 I am able to plan and set my own learning goals
1.9 I have a break during long periods of work
1.10 I need to keep my learning routine separate from my other commitments
1.11 I relate my experience with new information
1.12 I feel that I am learning despite not being instructed by an instructor
1.13 Any Other? (Fill in)

2. Learning Strategies

2.1 I participate in group discussions
2.2 I find peer coaching effective
2.3 I find 'role play' is a useful method for complex learning
2.4 I find interactive teaching-learning sessions more effective than just reading materials
2.5 I find simulation in teaching-learning useful
2.6 I find learning from case studies useful
2.7 My inner drive directs me towards further development and improvement in my learning
2.8 I regard problems as challenges
2.9 I arrange my self-learning routine in such a way that it helps develop a permanent learning culture in my life
2.10 I find concept mapping is an effective method of learning
2.11 I find modern educational interactive technology enhances my learning process
2.12 I am able to decide my own learning strategy
2.13 Any Other? (Fill in)

3. Learning Activities

3.1 I rehearse and revise new skills

3.2 I identify the important points when reading worksheets and job aids

3.3 I use concept mapping/outlining as a useful method of comprehending a wide range of information

3.4 I am able to use information technology effectively

3.5 My concentration intensifies and I become more attentive when I read complex study materials

3.6 I keep annotated notes or a summary of all my ideas, reflections, and new learning

3.7 I enjoy exploring information beyond the prescribed course objectives

3.8 I am able to relate knowledge with practice

3.9 I raise relevant question(s) in teaching-learning sessions

3.10 I am able to analyze and critically reflect on new ideas, information or any learning experiences

3.11 I keep an open mind to others' point of view

3.12 I prefer to take breaks in between learning tasks

3.13 Any Other? (Fill in)

4. Evaluation

4.1 I self-assess before I get feedback from trainers

4.2 I identify the areas for further development in whatever I have accomplished

4.3 I am able to monitor my learning progress

4.4 I am able to identify my areas of strength and weakness

4.5 I appreciate when my work can be peer reviewed

4.6 I find both success and failure inspire me to further learning

4.7 I value criticism as the basis of bringing improvement to my learning

4.8 I monitor whether I have accomplished my learning goals

4.9 I check my learning plan to review my progress

4.10 I review and reflect on my learning activities

4.11 I find new learning challenging

4.12 I am inspired by others' success

4.13 Any Other? (Fill in)

5. Interpersonal Skills

5.1 I intend to learn more about other cultures and languages I am frequently exposed to

5.2 I am able to identify my role within a group

5.3 My interaction with others helps me to develop the insight to plan for further learning

5.4 I make use of any opportunities I come across

5.5 I need to share information with others

5.6 I maintain good interpersonal relationships with others

5.7 I find it easy to work in collaboration with others
5.8 I am successful in communicating verbally
5.9 I identify the need for creating diverse relationships to maintain social harmony
5.10 I am able to express my ideas effectively in writing
5.11 I am able to express my views freely
5.12 I find it challenging to pursue learning in a culturally diverse ~~milieu~~ environment
5.13 Any Other? (Fill in)

***Modified SRSSDL survey used with permission, November 29, 2019.**

Williamson, S.N. (2007). Development of a self-rating scale of self-directed

learning. *Nurse Researcher*.14(2) 66-83

Appendix F: Email Permission to use Peng's Adaptive Learning Model

From: hongchao5d@qq.com <hongchao5d@qq.com>
Sent: Thursday, May 20, 2021 8:44 PM
To: Sarah Scott-Nelson <sarah.scott-nelson@outlook.com>
Subject: 回复：Request to Cite Your Paper, "Personalized adaptive learning" in Doctoral Thesis

of course

发自我的华为手机

------ 原始邮件 ------
发件人：Sarah Scott-Nelson <sarah.scott-nelson@outlook.com>
日期：2021年5月21日周五 09:24
收件人：hongchao5d@qq.com
主 题：Re: 回复：Request to Cite Your Paper, "Personalized adaptive learning" in Doctoral Thesis

Hongchao,

Thanks so much! Would it be alright to include this diagram as well?

Fig. 3 The spectrum of adaptive adjustment instruction strategies based on man-machine collaborative decision-making

Thank you again,
Sarah

From: hongchao5d@qq.com <hongchao5d@qq.com>
Sent: Thursday, May 20, 2021 8:15 PM
To: Sarah Scott-Nelson <sarah.scott-nelson@outlook.com>
Subject: 回复：Request to Cite Your Paper, "Personalized adaptive learning" in Doctoral Thesis

it 's my pleasure. Thanks

发自我的华为手机

------ 原始邮件 ------
发件人：Sarah Scott-Nelson <sarah.scott-nelson@outlook.com>
日期：2021年5月21日周五 09:09
收件人：hongchao5d@qq.com
主 题：Request to Cite Your Paper, "Personalized adaptive learning" in Doctoral Thesis

Hello Hongchao,

I am writing on behalf of a doctoral student in education who would love to cite your paper in her doctoral thesis on androgogy and adult education. I am her research assistant, and she is requesting your permissions to cite.

Would that be okay with you?

Let me know and thank you so much!

Vitae

Suzanne Scott-Muenter

Suzanne has worked in high technology and financial services industries as a Learning Strategist, Technical Training Manager, Global Training Manager, and Senior Instructional Designer at various Fortune 500 companies, such as Edward Jones, Cisco Systems, Inc., Apple Computer, Hewlett-Packard, and Agilent Technologies Inc. At several smaller firms, such as Infinite Training Solutions, LLC, TTC Innovations, DHL Worldwide Airways, Syva, Inc., and the Microwave Training Institute, Suzanne applied her expertise to create successful training programs to serve a wide variety of learners.

Throughout her career, Suzanne has focused on the creation and management of key training solutions that solve customers' needs and provide a measurable return on investment. Suzanne graduated with a Bachelor of Science (B.S.) degree in Business Administration from California Coast University. She holds a Master of Arts (M.A. Ed.) degree in Education, focused on Instructional Design and Technology from San Jose State University.

While the majority of Suzanne's background was focused in the technical training area, she has also managed the development and deployment of many global learning programs, such as new employee orientation and high potential leadership retention programs. Suzanne's breadth of experience has covered a variety of technologies and engineering topics, networking technologies, corporate cultural development, and financial services topics within service center and technical field sales skill settings.