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# An Examination Of Student Self-Regulation Learning Strategies In Online Courses At A Hispanic Serving Institution

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AN EXAMINATION OF STUDENT SELF-REGULATION  
LEARNING STRATEGIES IN ONLINE COURSES  
AT A HISPANIC SERVING INSTITUTION

RICARDO ACEVEDO

DOCTORAL PROGRAM IN EDUCATIONAL LEADERSHIP AND ADMINISTRATION

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## **DEDICATION**

I want to dedicate this dissertation to my son William who has taught me that failure is never an option is only another learning experience. For my wife Rocio that has been supporting me during my educational journey, 4 degrees later, I am stronger and more focused than ever to fulfill my dreams and ambitions, thank you for your love. To my parents who gave me life and inspired me to become better and to all my family, always remember, yes we can. This dissertation is for all the people that believed and for all the people that doubted in me, is because of all of you that I was able to finish this long and exhaustive journey. I want to thank God for the incredible opportunities, challenges, and happiness that I have had in the first-half of my life. I expect an amazing reinvigorated, re-born and full of success, prosperity, and opportunities in the second-half of my life. I see this milestone as an intellectual, professional, personal, and spiritual renaissance in the quest to contribute to society and to serve the ones in need, in particular low socioeconomic and First Generation students.

*In my doctoral journey, with all the adversities and rewards, I redefined myself.*

AN EXAMINATION OF STUDENT SELF-REGULATION  
LEARNING STRATEGIES IN ONLINE COURSES  
AT A HISPANIC SERVING INSTITUTION

Submitted

by

RICARDO ACEVEDO, MBA, M.S.

DISSERTATION

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The University of Texas at El Paso  
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## **ABSTRACT**

The study examined student utilization and application of learning strategies in college level online courses and the context was a Hispanic Serving Institution (HSI) in the Southwest. Even though online courses continue to grow at a steady pace, few research studies have taken the task to analyze the utilization of learning strategies and their utility in online learning programs and under the fold of student success. The overarching purpose of the present study was to delve into important student factors across learning strategies under this instructional format. For the present study a multivariate analysis of covariance with five outcome variables and a covariate (GPA) was used with observational data obtained from a sample of 582 college students. The study examined the main and interaction effects between gender, college student's generational level, level of online learning experience across the five Motivated Strategies for Learning Questionnaire (i.e., Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) employed by students in an online learning environment. All in all, there were few observed differences across these factors with the largest significant differences contributing to no more than 4 percent of the variance accounted for. These findings seems to indicate that regardless of gender, generational level, and level of online experience, students are making, for the most part, similar use of these strategies with especial note on the prevalent use of the critical thinking learning strategy. Thus, this indicates that there is a need to further examine other important educational and instructional strategies for this learning environment. The study provides a series of recommendations for future practice and research not only for student self-regulation learning but also for faculty and administrators as well.



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## CHAPTER I: THE PROBLEM

*The Power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect.*

**Tim Berners-Lee**

### INTRODUCTION

Online learning is challenging the status quo in higher education with over six million students enrolled, taking at least one online course coupled with an observed drop of one million face-to-face students on campuses across the nation in the fall of 2015, (Distance Education Enrollment Report, 2017). As academic technologies continue to be utilized in higher education, its uses and integration have transformed online learning from its origins in 1969 with the inception of Britain's Open University, which introduced the first iteration of online learning. Lumsden and Ritchie (1974) stated:

“An innovative institution...The Open University of the United Kingdom constitutes the first major attempt in university education to use the media of television and radio for all formal lectures in every course offered” (pg. 1).

As new advancements in telecommunications spread, including the development of Internet, a new era of distance learning was born in the form of computer-based instruction delivered over networks (Moore & Kearsley, 2005). As access to the Internet became widely available, anyone with technical skills was offered a space to publish, share their own ideas and knowledge with others via the internet (Ball, 1995).

Since 1999, online learning has been evolving in the United States as an innovative way to improve instruction. It has been described as “an open and distributed learning environment that uses pedagogical tools enabled by the Internet-based technologies, to facilitate learning and knowledge building through meaningful action and interactions” (Dabbagh and Bannan-Ritland,

2005, p. 15). The significance of distance education is its potential to connect students around the world that share similar interests, its ability to integrate different learning styles, to facilitate student success. According to Reynard (2017), online learning continues to evolve as new academic technologies to enrich the learning experiences for many of its users through social media, smart phones, gamification, competency-based learning, and virtual reality, to name just a few. Even though distance education is rapidly expanding and its potential and use in higher education is without a rival, there is very little research evidence on how students are able to acquire new knowledge and concepts. Little is known about the specific learning strategies that facilitate or improve their academic work. Moreover, there is no sufficient research-based evidence on how online college students are using such learning strategies across gender, first generation, and level of experience in online learning.

Indeed, several factors have made distance education highly used/endorsed in higher education learning; it is also permeating higher education due to its accessibility, convenience, and the flexibility it provides to the non-traditional student population full-time and part-time students or working people, single parents, and those pursuing different career paths would not enroll at a traditional university or college (Killon, 2000). This enrollment is illustrated by the significant growth in student matriculation in which online enrollment figures in 2002 were recorded at 9.3%; and ten years later in 2012, the student enrollment growth increased to 32% (Allen and Seaman, 2013; National Center for Education Statistics, 2014). Certainly, those numbers continue to increase even more according to the latest Babson Report (2017) as shown in Figure 1.



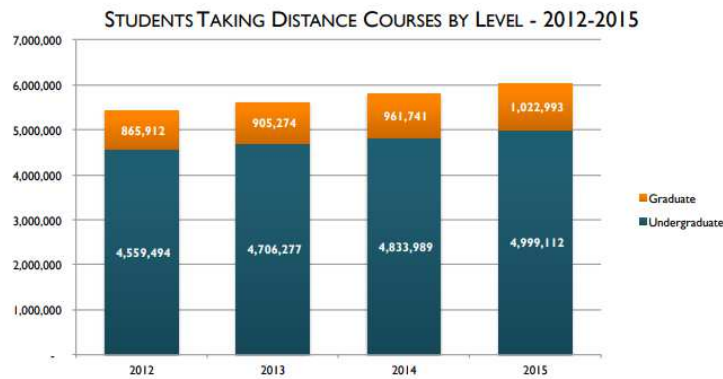


Figure 1. Students Taking 100% Online Classes in Higher Education, Babson Report (2017).

The total number of college students taking at least one online course was approximately 5,425,406 in 2012. According to Allen & Seaman (2013), in 2015 this number increased to 6,022,105, an increase in enrollment of 9%. From the 6,022,105 distance education students, 4,999,112 were studying at the undergraduate level and 1,022,993 at the graduate level (as shown in Figure 1). Even though enrollment for online learning has been continuously rising, the main delivery method of instruction in higher education continues to be face-to-face teaching. Figure 2 portrays the steady increase on the use of distance courses taken by students from 2012 to 2015.

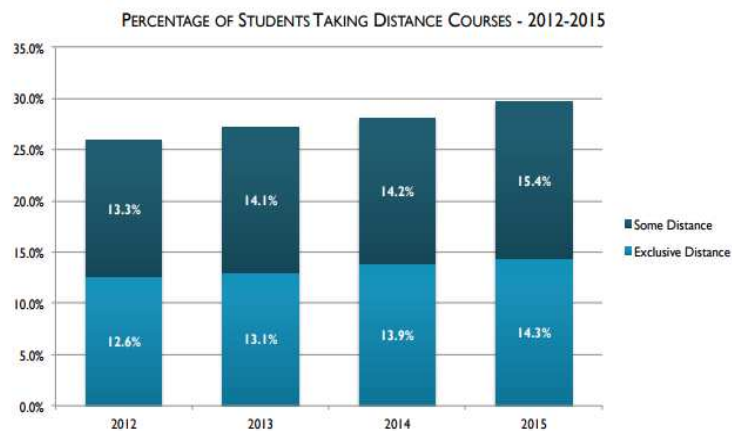


Figure 2. Percentage of Students taking line Classes in Higher Education, Babson Report (2017).

As shown in figure 2, in 2012 the percentage of college students taking at least one online class was 25.9%, this number increased to 29.7% by 2015. The reason this change in enrollment is important is because many universities are using online learning as a long-term sustainability measure to increase tuition revenue as one of their strategic goals.

Even though enrollment in online learning has steady increases from 2012-2015, not all institutions of higher education have witnessed the same incremental enrollment as shown here:

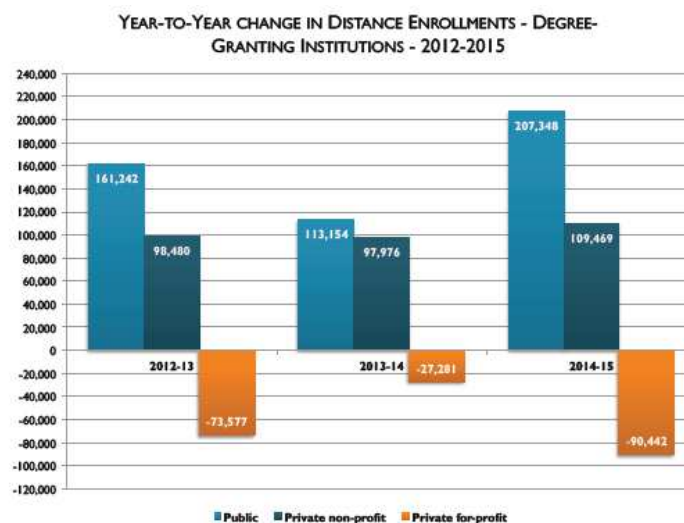


Figure 3. Enrollment changes in Degree Granting Institutions, Babson Report (2017).

Public universities increased the enrollment from 161,242 students in 2012 to 207,348 students in 2015 or 22 percent increase, while private for-profit institutions lost 73,577 in 2012 to 90,442 or 19 percent decrease. Those numbers clearly indicate how online learning students are opting for public universities as their first choice when pursuing online courses. As universities continue to adopt online learning as a long-term institutional sustainability strategy, educational administrators around the country are competing to position their universities to meet the infrastructure, connectivity, high quality learning experiences, and pre-established outcomes that other online institutions are successfully providing in their online programs (Allen &

Seaman, 2013; Ficklen and Muscara, 2001; Hernandez-Ramos, 2005). In the Babson Survey Research Group report, Allen & Seaman (2013) reported that when this report series began in 2002, “Less than one-half of all higher education institutions reported that online education was critical to their long-term state and that number is now close to seventy percent” (p. 4). This statement is crucial since tuition revenue has been declining despite enrollment growth; this is supported by Hogan (2012) who stated that, “Universities are turning to online learning to increase tuition revenue by serving more students” (p. 15). As a way to increase additional revenues, most universities are implementing online learning programs and charging additional distance learning fees.

Institutional and educational technologies are evolving at a very fast pace and administrators should be cognizant of all those changes in order to develop better academic programs and curricula including online programs with courses that are more interactive, engaging, and pedagogically designed. Also, these academic technologies can tailor the course content and materials to meet or exceed the students’ learning needs and demands. Moreover, attrition rates in online learning are as high as 70-80% in some programs (Flood 2002, Tyler-Smith 2006). Recent news in the field of online learning clearly reflects some of these issues.

In 2017, the Higher Learning Commission a regional accreditor denied an Arizona Community College’s bid to increase its online degree offerings when a Scottsdale Community College requested to add 48 new online certificates and degree programs (Smith, 2017). The main issue was that the accreditor found several inconsistencies in their existing online program to students, including a decentralization of many of their own online programs. This is crucial because as universities and community colleges expand their online programs, quality standards need to be established in order to guarantee that the student learning is happening. Another

similar case happened to Western Governors University when it lost its federal student-aid programs and were required to repay over \$713 million to the Department of Education (Fain, 2017). One of the complaints from the auditor was that there were no regular and intentional interactions with the instructors and therefore limited, social presence that is an important pedagogical factor for online learning. This university, with almost 83,000 students, faced negative publicity that not only affected enrollment but also the reaccreditation process by the Northwest Commission on College and Universities. These two examples may be seen as isolated incidents at a glance, but they have shown the complexities involved in the stakeholder's governance in online learning. Therefore, as enrollment in online courses is surpassing over 6,000,000 students in the U.S., the main question arises in relation to whether students are indeed utilizing the appropriate learning strategies in online learning when compared to face-to-face classes.

## **STATEMENT OF THE PROBLEM**

Online learning has been proliferating around the world. As a result, this industry is expected to reach near \$325 billion by 2025, making this industry a very lucrative one. The impact in distance education is generating business opportunities ranging from learning management system (LMS), mobile, apps, virtual classroom, and other academic technologies (Globe Newswire, 2017). However, little is known about the different learning strategies used in online classes by college students (Angelino, Williams, and Natvig, 2007; Lei and Gupta, 2010; Nichols, 2010; Wang, 2004). Specifically, for the present study, we were interested in examining the different types of learning strategies that college students used in online courses. Examining the type of learning strategies used by students may assist colleges and universities given that they rely heavily on distance education to increase tuition revenue by bringing more students

who can successfully complete their studies. Online learning is becoming mainstream in the 21<sup>st</sup> century higher education model. Nevertheless, how do we know if distance education students are leaning? This study focused on examining how male and female students who are either first generation or continuous generation college attendees, including their level of online use experience in the past, used the learning strategies that helped them succeed in online learning in a Hispanic Serving Institution (HSI) in the Southwest region.

This Hispanic Serving Institution is located in the world's largest bi-national metropolitan area, totaling 2.5 million residents. Also, this HSI is an economic engine to the region with a direct impact of \$1.3 billion dollars and is becoming a leading institution in producing Hispanic graduates. It is the only research-doctoral university in the United States with a Mexican-American majority student population or about 80 percent Hispanics, emulating the region that it serves.

## **RESEARCH QUESTIONS**

The proposed research project was guided by the following research questions:

1. Are there gender mean differences in the use of learning strategies as measured by the Motivated Strategies for Learning Questionnaire MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported Grade Point Average (GPA)s?
2. Are there differences between first generation and 2<sup>nd</sup> generation college students in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?

3. Are there differences between college student's level of online experience in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
4. What are the 3 first-order interactions and their relation to the MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
  - Gender X Generational Level
  - Gender X Level of Online Experience
  - Generational Level X Level of Online Experience
5. What are the second-order interaction and its relation to the MSLQ learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
  - Gender X Generational Level X Level of Online Experience

## **PURPOSE OF THE STUDY**

The proposed study was an attempt to discover what learning strategies are being used in online courses by college students in a Hispanic Serving Institution in the U.S. Southwest. Even though online courses are growing at a steady pace, few research studies have analyzed the learning strategies in online learning programs. Furthermore, this study provided some guidance for higher education administrators, policy makers, and other stakeholders such as tax-payers, governing board members, and other decision makers about the use of learning strategies in today's digital world, an important aspect in higher education institutions (Angelino, Williams, and Natvig, 2007). Also, it helped online students identify some of the characteristics of self-

regulation, self-direction, and self-efficacy, which fall under the scope of learning strategies (i.e. an individual's approach to complete a task). Faculty members were able to reflect on what learning strategies were being used by online learning students, and by doing so, faculty was able to find better delivery methods for knowledge transfer, assessment and teaching strategies in online settings (Angelino, Williams, & Natvig, 2007). Few studies have examined factors such as gender, generational level of student, and student levels of prior experiences with online learning (Ishitani, 2006; Yukselturk and Bulut, 2009), thus the overarching purpose of the present study was to delve into these factors across important learning strategies under this instructional format. Finally, the proposed study may have given stakeholders (i.e. University Senior Administrators) some degree of assurance that their students are using different or a variety of learning strategies to acquire their degrees, which in turn may have encouraged senior administrators to continue investing in online programs.

#### **ASSUMPTIONS**

An assumption of the study was that the participating student may report truthful and accurate perceptual information when responding to the self-reported MSLQ survey items and demographic questions. Another assumption was that the MSLQ instrument was developed predominantly for white, middle class students, but the validity and reliability results from previous studies, in particular the research conducted by Arend (2007), made this instrument sufficiently psychometrically robust for any self-report college student research study that measures learning strategies online for Hispanic and first-generation college students. Even though the MSLQ was constructed for a different normative group, the assumption was that it works similarly for Hispanic students, as well. In other words, its psychometric properties were sound.

## **LIMITATIONS**

Some of the limitations of the study were that the MSLQ is a self-reported measure, thus there was no control on the type of a personal perception response elicited by its items and on the response rate by the participants. Second, the study participants were randomly selected at the course level, therefore, the generalizability of the study was limited to only similar college student populations that employ similar learning management systems and technologies, including type of courses and the level of those courses. The use of a selecting sampling technique that may not be random may also have limited the generalizability of the study to other college population of students who may not possess similar demographics of the participating students in this study. And, since randomization did not occur at the individual participant, self-selection could be an issue.

## **DELIMITATIONS**

As results provided by other studies, the present study included some important delimitations. The first delimitation for this study was that it focuses primarily on students attending a Hispanic Serving Institution in the Southwest. Another delimitation was that this study focuses on gender, college student's generational level, level of online learning experience, and the five MSLQ learning strategies that are employed by college students in online learning. Additionally, each of the MSLQ learning strategies: Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation was a delimitation.

## **RESEARCHER'S BIAS**

The researcher worked as an academic advisor at the same institution in which the study was conducted. In this capacity, the researcher advised pre-science and science students to take the courses that were suited for their degrees as well as recommended the most appropriate



learning environment (whether face-to-face, blended, or fully online) according to their academic strengths and learning needs. Also, the researcher's experience as an instructional designer which consisted in assisting faculty with the design of curriculum, instruction, and multimedia-based course materials, and coordinating and implementing media production for courses related to the creation of online, hybrid and face-to-face courses. The longer the researcher assisted faculty in their instructional technology needs, the more his interest increased in trying to understand what learning strategies were being used by students. Even though the faculty and the technology for online learning were constantly improving, some students continued to fail in the online courses. As the researcher was trying to find answers in the academic literature, the researcher discovered the need to develop a study because there was very limited literature addressing what learning strategies were being used by college students and if there were any differences in what learning strategies were being used based on gender, first generation, and level of experience in online classes.

## **CHAPTER I SUMMARY**

Universities across the country are facing different challenges to remain afloat in the current economic climate due to scarce resources, decreases in state appropriations, reduced tuition revenues, and reduction of student enrollments in face to face courses; and, as a result, they are adopting online learning as a long-term sustainability strategy (Allen & Seaman, 2013; Ficklen & Muscara, 2001; Hernandez-Ramos, 2005). This study intended to contribute on the knowledge-based by understanding the importance of gender, college student's generational level, the level of online learning experience, and the learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive Self-Regulation) employed by college students in online learning. A detailed literature review regarding online learning and learning strategies will be discussed in chapter 2.

## DEFINITION OF TERMS

**Asynchronous:** Being digital communication (as between computers) in which there is no timing requirement for transmission and in which the start of each character is individually signaled by the transmitting device (Redmond, 2011).

**Blended Learning:** Blended learning is not the same as technology-rich instruction. It goes beyond one-to-one computers and high-technology gadgets.

**Distance Education:** Education that uses one or more technologies to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor synchronously or asynchronously (The Integrated Postsecondary Education Data System [IPEDS], 2014).

**E-Learning:** Learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom. In most cases, it refers to a course, program or degree delivered completely online (E-learning, n.d.).

**Face-to-face:** When an instructor and students at a non-profit educational institution are together in a single place devoted to instruction, and where the teaching and learning takes place in the same geographical location at the same time (Redmond, 2011).

**Higher Education:** Education or learning at a college or university (Geiger, 2014).

**Online Learning:** A form of education where students learning is taught 100% over the Internet, participation, engagement, interactions, assignments, assessment, and learning content is exchange electronically (Laaser, 2011).

**Synchronous:** Live-communication (i.e. Skype, Facetime, Blackboard Collaborate). Happening, moving, or existing at the same time. Live-communication (i.e. Skype, Facetime, Blackboard Collaborate) (Redmond, 2011).

**Technology Literacy:** The ability of an individual, working independently and with others, to responsibly, appropriately and effectively use technology tools to access, manage, integrate, evaluate, create and communicate information (Schools, 2011).

**Learning Experience:** Any interaction, course, program, or other experience in which learning takes place, whether it occurs in traditional academic settings (schools, classrooms) or nontraditional settings (outside-of-school locations, outdoor environments), or whether it includes traditional educational interactions (students learning from teachers and professors) or nontraditional interactions (students learning through games and interactive software applications) (Edglossary.org).

**Learning Strategy:** A learning strategy is an individual's approach to complete a task. More specifically, a learning strategy is an individual's way of organizing and using a particular set of skills in order to learn content or accomplish other tasks more effectively and efficiently in school as well as in nonacademic settings (Schumaker and Deshler, 1992).

**First Generation:** a first-generation student as one whose neither parents have earned a college degree (Thayer, 2000).

**Hispanic-Serving Institution (HSI):** an institution of higher education that— (A) is an eligible institution; and. (B) has an enrollment of undergraduate full-time equivalent students that is at least 25 percent Hispanic students (Department of Education).

## **CHAPTER II: THE LITERATURE REVIEW**

*The important thing is not to stop questioning;  
curiosity has its own reason for existing.*

**Albert Einstein**

### **INTRODUCTION**

The following chapter describes the development of online learning from its origins to the latest developments in online learning. This literature review explores the previous and current changes in distance education and student learning experiences specifically. The review includes the following topics: origin of online education, enrollment rates, and characteristics of online learners, gender, first generation students, learning strategies for online learners, and the theoretical framework of Self-Regulation (Bandura, 1988; Zimmerman, 1989) and how it applies specifically to online learning.

### **HISTORY OF ONLINE LEARNING**

As new advancements in telecommunications, and with the development of the World Wide Web, a new era of distance learning was born in the form of computer-based instruction delivered over networks (Moore and Kearsley, 2005). The missing ingredient in online learning was the computer, as it provided a platform for exchange of information ideal for online learning, as well as established a new form of digital communication. The first email messages were sent on the Intel inter-office system, and in 1978, the first Bulletin Board System (BBS) was established (Moschovitis, Poole, and Senft, 1999). The significance of online learning is its potential to create a dynamic platform that allows in real time the fostering of synchronous and asynchronous interactions by the content expert(s) and the student(s), around the world and creates an environment where learning is accessible and exchangeable to all students with

different learning styles and adopting their own learning strategies. Once the computer was available, a Learning Management System (LMS) was required to serve as a two-way learning platform for the exchange of information, not only affecting online learning, but education in general as described by Coates et al., (2005). They explained that, “Through making the internet a more seductive and accessible tool for teaching, LMS may also be homogenizing the creation, style and ownership of pedagogical knowledge” (p. 32).

Participating universities benefit from the use of LMS in the following ways: (a) real-time access to learning content anytime and anywhere, (b) a one-stop place of learning, (c) data analytics to enhance student learning and performance, (d) increased efficiency in assignment submission and student engagement, and (e) synchronous and asynchronous communication. This is represented in the way online learning is evolving (Coates et al., 2005). LMSs are responsible for a culture change in higher education in the way the teaching and learning activities are developed using real-time data and communication(s). Also, LMSs allow interactions amongst the content expert, knowledge, student(s), and these online learning relations are unique in higher education (i.e., faculty-student; student-student; student-content). The unique feature of having the content organized and available in real-time makes online learning a very strong educational environment by empowering students to earn their own learning experience.

As the World Wide Web and Internet connectivity continue to evolve, they provide an ideal platform for online learning technologies that are conducive for collaboration and exchange of ideas. According to Khan (1997), a well-designed online learning course has the potential to offer multiple characteristics specific to acquire new knowledge and teaching that can address technological and andragogical strategies among the different online student learners. In

addition, another study comments about the flexibility and adaptability of online learning and its potential that provides for the different learning abilities to be present and developed in spite of geographic isolation (Osciak and Milheim, 2001). The future of distance education will require a new type of smart LMS to meet the student needs and demands in the virtual classroom. Where acquiring new knowledge is customizable and adaptable and is tailor to each online student. Many students want to have more personalized LMS experiences, customizable to their own learning styles. For instance, they want to set up their own pace and depth of knowledge to reach their learning goals (Brown, Dehoney, and Millichap, 2015). The student interest in online learning was shown by the increase enrollment in online classes.

#### **ONLINE LEARNING ENROLLMENT**

A study conducted by Allen & Seaman (2010) described a compounded annual growth rate of 19% of students enrolled in at least one course from 2002 to 2008. Significant online enrollment growth in 2002, recorded at a 9.3% increase; and ten years later, student enrollment growth increased to 32% in 2012 (Allen & Seaman, 2013). Even though enrollment for online learning has been continuously rising, the main delivery method of instruction in higher education continues to be face-to-face teaching. Figure 4 portrays the steady increase on the use of distance courses taken by students from 2012 to 2015.

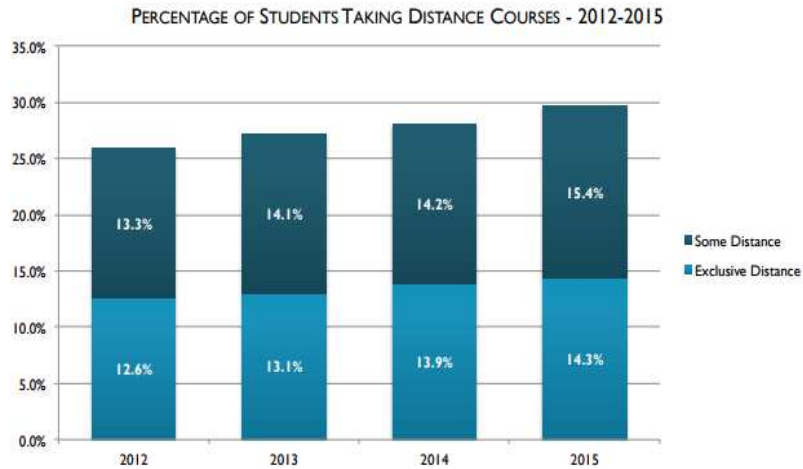


Figure 4. Students taking Online Classes in Higher Education, Babson Report (2017).

As shown in figure 4, in 2012 the percentage of college students taking at least one online class was 25.9%, this number increased by 2015 to 29.7%. There is a 1.7 % increase from 2012-2015 between those students taking at least one online course with an increase of about 2.1 percent increase with a similar increase for full enrollment in students taking only fully online courses. The reason this change in enrollment is important to understand is because many universities are using online learning as a long-term sustainability measure to increase tuition revenue as one of their strategic goals.

Many universities that are incorporating online learning as a long-term sustainability strategy, should also consider that online student learners require different learning strategies than those used on regular face-to-face courses (Clinefelter and Magda, 2013). There are some distinctive difference between the face-to-face and online instruction, in face-to-face instruction the content expert (faculty) dictates the pace and scope of learning during class time, forcing the learners (students) to adapt not only to that particular way of instruction, but the way the interactions among the faculty-student, student-student, information-student are established during the length of the class. However, the online instruction is different because the content



expert (faculty) becomes a facilitator of knowledge, where the content is available 24/7 for synchronous and asynchronous activities, and because there is a virtual classroom the social presence by the faculty and students is crucial for establishing a positive learning environment, where a digital communication space is developed for online discussions, forums, help-boards. This social presence creates the emerging community of inquiry and is directed towards finding solutions for a specific topic, resolving doubts, or working in a particular project (Jézégou, 2010). Social presence in online learning creates unique interactions between faculty, students, and knowledge. In relation to this, Jézégou (2012) explained the following:

Transactions between students, social interactions involving different point of views, negotiations, solutions to shared problems (socio-cognitive presence);

1. Interactions that create a socio-emotional climate conducive to student engagement and exchange of ideas fostering a positive climate (socio-affective presence);
2. Interactions between the faculty (facilitator) and students were organization of content materials, asynchronous and synchronous communications, individual and group activities, projects contribute to a conducive socio-emotional climate (pedagogical presence). (p.18)

Those unique interactions in distance education along with social presence allow the online student to self-regulate his/her own learning experiences and results in continuous enrollment increases in online learning.

Moreover, understanding student learning strategies could benefit those current and future universities, whose courses should be developed to better assist those online student learners and to reduce attrition rates in online programs. This is very important as enrollment

breaks new records and there is a significant shift from face-to-face to online learning instruction according to Allen & Seaman (2013). The 6,022,105 total of distance education students for 2015 includes 4,999,112 who are studying at the undergraduate level, and 1,022,993 who are studying at the shown in Figure 5.

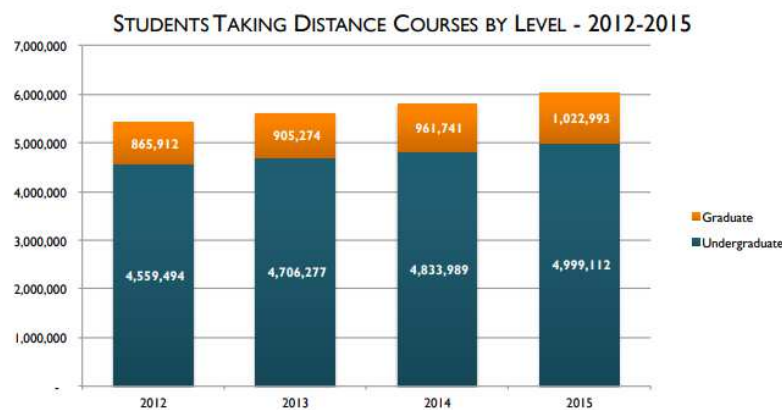


Figure 5. Students taking Online Classes in Higher Education, Babson Report (2017).

For policymakers and administrators, understanding the conditions that contribute to student retention and persistence helps to ensure institutional effectiveness, as reducing attrition is more cost-effective than recruiting new students to replace those lost in a high-dropout situation (Chyung and Trenas, 2009). In addition, another factor that affects enrollment figures deal with completion rates. In order to increase completion rates among online college student learners, it is important for students to adopt critical thinking and metacognitive learning strategies (Angelino, Williams & Natvig, 2007; Tyler-Smith, 2006).

## THE ONLINE LEARNER

There is a 5:1 ratio of undergraduate vs graduate students enrolled in at least one online learning class. The percentage of undergraduates' students enrolled in at least one online class is 83.0%; it almost reaches the total undergraduate enrollment of 85.3% in higher education in the U.S. (Allen & Seaman, 2013). The vast majority of students enrolled in online learning are adults

ranging from 25 to 50 (Moore & Kearsley, 2011). Students are entering online learning for various reasons: accessibility, convenience, and flexibility. The online student is expecting learning experiences that lead to attaining an education that can be accomplished on their own time and geographic locations (Killon, 2000). The distance learning population is also becoming more heterogeneous or diverse, encompassing students from a variety of cultural and educational backgrounds. Research suggests that Millennials and X generation are increasingly growing up with the Internet-based technologies such as search engines, instant messaging, massive Multiplayer Online Role-Playing Games (MMORPG), and social media, are well prepared to engage in online learning activities that support synchronous and asynchronous communication and interaction (Dabbagh and Bannan-Ritland, 2005). Although students of Generation X (born between 1960 and 1980) continue to represent the majority of online distance education learners, Millennials (born between 1980 and 2000) will soon represent a sizable portion of this population, bringing with them a new communication and emergent technological skill set (Montgomery, 2009).

Previous studies indicated that interpersonal interaction, which is interaction among different people, communication skills, and fluency in the use of collaborative online learning technologies are critical competencies for the online learner (Dabbagh & Bannan-Ritland, 2005). According to Candy (1991), as part of another learning strategy, student learners may reveal different levels of self-direction in different learning situations. Self-directed learning can be described as a learning strategy of “learning how to learn,” or being metacognitively aware of one’s own learning (Olgren, 1998, p.82).

In particular, learners may have a high level of self-direction in an area in which they are familiar, or in areas that are similar to a prior experience. For example, an online student may

have a high level of self-direction in learning how to use a learning management system such as Blackboard, Moodle, Canvas, etc. This is supported by another study that describes that in online learning courses, students must possess under the scope of learning strategies, “self” behaviors such as self-discipline, which is the ability to make yourself do things that should be done; self-efficacy, which is one's ability to succeed in specific situations or accomplish a task; self-initiative, which is the ability to do something before others tell you to do it; and self-management, which indicates when the individual is taking responsibility for one's own behavior and well-being, which are characteristics of self-regulated or self-directed learning (Cheurprakobkit, Hale, and Olson, 2002). In other words, online learning students in order to be successful in their classes they need to be able to discipline themselves and become aware of their own knowledge acquisition. They need to know their strengths and limitations as students to improve their academic success in higher education.

## **GENDER DIFFERENCES**

Some studies have mentioned the way male and female develop their cognitive abilities in relationship to each other. For example, according to Garland and Martin (2005):

“There was a difference in the learning style of online student and the student in the face-to-face course and gender was a factor in the relationship between learning style and student engagement...The online instructor must also be aware of how discussions, chats, and groups are affected by gender, keeping in mind that required postings might be intimidating to some female students.” (p. 77)

For example, male students in online learning do not report a higher sense of community than female counterparts, but they interact more often in an online learning environment; yet female students tend to perform better academically (Howard, 2010). Nonetheless, gender differences are reduced when students enter adulthood; this is consistent with internet usage,

which is not produced by male or female specific interactions, but this gap is the result of socioeconomic and other socialization factors (Bimber, 2000).

First Generation students who enter online learning are more likely to have lower graduation rates than non-first-generation classmates (Engle and Tinto, 2008; Soria and Stebleton, 2012). This information is very important for higher education institutions to understand because first-generation students bring a myriad of unique perspectives and challenges. For instance, Lightweis (2014) suggested that 34% of college and university freshman are first-generation students and the student retention of this first-generation group is only 73% for the second year. As student support services are being developed and reinvented across higher education, early warning system are required to provide assistance to our most vulnerable students. Special attention needs to be given at the first-generation student population. For example, university advising centers need to create ways of tracking first-generation student progress in real-time to develop proactive interventions during the semester while the student is taking the course rather than waiting after the student has failed and is placed in probation or suspension. Another, proactive intentional intervention is developing a student support app (SSA), where student affairs provide not only a variety of career opportunities, but also; customizable updates in the product and services that the university provides for student socialization and engaging experiences. Also, this same app could be used by academic affairs by merging it with the university's LMS to provide real-time progress reports and identify early interventions that could help all the students, this first-generation student population.

### **FIRST-GENERATION STUDENTS**

According to different studies, the definition of first-generation status has the following characteristics: 1) One whose parents had never attended college (Brown and Burkhardt, 1999;

Núñez, 1998), as others defined a first-generation student as one whose neither parents have earned a college degree (Thayer, 2000). Richardson and Skinner (1992) indicated that first-generation students had multiple obligations and education is not the most important one. They lack financial literacy, organizational and time management skills, know little to none on the intricacies of higher education about the products and services provided to support student success. These first-generation students often do not attend high school to prepare for college (Forbus et al., 2011). As previously discussed, education is not the first priority and in many cases is the last resource for a bright future and well-being. First-generation students often have lower career ambitions, lack of administrative, family and peer support, anxiety over the college environment, and poor study skills.

Núñez (1998) described that first-generation students were more likely to be older, female, Hispanic, low socioeconomic status, big family size, and employment status/hours worked than their non-first-generation classmates. Nunez findings are supported by Brown and Burkhardt (1999) when they identified two negative outcomes in first-generation students: probation and withdrawal from college. Interestingly, online learning is steadily increasing numbers of first-generation students (Methvin, 2012). Zimmerman and Martinez-Pons (1986) believed that using self-regulated learning strategies, students can develop the ability to navigate unfamiliar learning environments, in this case, online learning. For the present study, we used self-regulation as the theoretical framework as the lens to understand how online learners utilized this strategy to acquire new knowledge in distance education.

## THEORETICAL FRAMEWORK

It is important to emphasize that Bandura's triadic analysis of human functioning characterized by the personal, behavioral, and environmental components to understand self-direction, which is a socio-cognitive concept of the socio-cognitive theory (Bandura, 1986). For the socio-cognitive theory those components work in conjunction as part of reciprocal causality system, as shown in Figure 6:

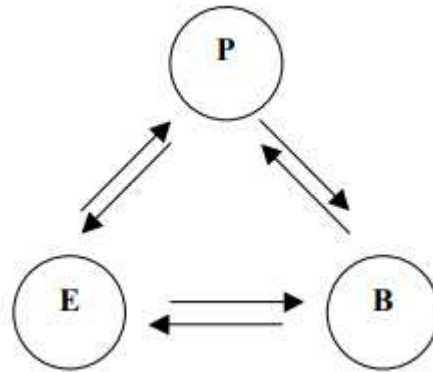


Figure 6. The model of triadic reciprocal causality (Bandura, 1986).

This model of reciprocal causality is made of three components: **(P)** personal, **(B)** behavioral, **(E)** environmental. Interactions among the components are subject to reciprocal causality. Those components are constantly adjusting to conditions, activities, agencies, and the individual could have more preponderance on a component, continuously accommodating to specific situations, creating a very dynamic model. Resulting in the learner's self-direction adjustment to change when encountering specific circumstances. For example, when a student needs to prepare for a final exam, the student **(P)** has a change in behavior as he/she sets strategies to obtain a high grade on his/her exam **(B)** and adjusting his/her level of preparation for the final exam or environment **(E)**. This model is the foundation of self-regulated learning, which by definition explains how students are owners of their own learning process by actively regulating their levels of metacognition, motivation, and behavior (Zimmerman, 1989).

Bandura's model of triadic reciprocal causality is modified by Zimmerman through the socio-cognitive research on self-regulation and three separate forms of control (Zimmerman and Labuhn, 2012). Each one refers to a specific form of self-regulation, as described below:

1. Covert self-regulation, this is the control exerted by the student on his or her emotions and motivation states.
2. Behavioral self-regulation, this is the control exerted by the student on his or her learning strategies (behaviors).
3. Environmental self-regulation, this is the control exerted by the student on his or her education environment (i.e. online learning) (p. 138).

According to Zimmerman (2002), the way the three forms of control are regulated are best illustrated as follows:

- Learners better achieve personal goals by self-regulating their behavioral,
- Environmental (adapting and adjusting to new situations), and
- Covert processes in a coordinated fashion (motivation and self-efficacy to new conditions).

For the present study, the three forms of self-regulation (Zimmerman, 1989) were modified and adapted for online learning. In the original model Zimmerman used three interdependent strategic feedback loops that regulate covert, behavioral, and environmental. Feedback from those control processes allow the student to adjust to alterations in their social and physical environments, behavioral outcomes, and covert thoughts and feelings (Zimmerman, 1989). Even though the three control forms of self-regulation are different, they work together in synergy and the three control forms working in conjunction. Therefore, a critical characteristic of these three forms of self-regulation model is its cyclical dependence on the continuous feedback



loop for the personal, behavioral, and environmental components to develop strategic adaptations as the student is forming his/her own learning.

For online learning, the three key forms of self-regulation (Zimmerman, 1989, p. 330) were modified. As the online learning students set his/her goals (**P**) through covert self-regulation, his or her behavior (**B**) for interacting with the online class will adjust through the implementation of learning strategies (in this case, Rehearsal, Organization, Elaboration, Critical Thinking, and Metacognition). As the online learning student interacts with the online learning environment (**E**) the level of experience from novice to experience will determine how well the student would be able to navigate and succeed in online learning classes. Importantly, a critical characteristic of these three forms of self-regulation model is its cyclical dependence on the continuous feedback for the personal, behavioral, and environmental components to develop strategic adaptations as the student is generating its own learning strategies. For example, as a novice a student in online learning could be difficult to navigate within the learning management system (LMS) and established a social presence within an environment that requires 100% self-discipline and self-direction. The student must adapt his/her behavior to understand the specific content for the class through the use of learning strategies for online learning. Nonetheless, because there is continuous feedback and there is interdependence between the three control forms, the student through the process of self-regulation should be able to modify or adjust his or her goals, learning strategies, and online learning experiences should facilitate the learning experience by eliciting strategic adaptations, resulting in academic success. Zimmerman (2002) stated that, "Self-regulated learning is not a mental ability or an academic performance skill; it is a self-directed process by which learners transform their mental abilities into academic skills." And this process is illustrated in Figure 7:

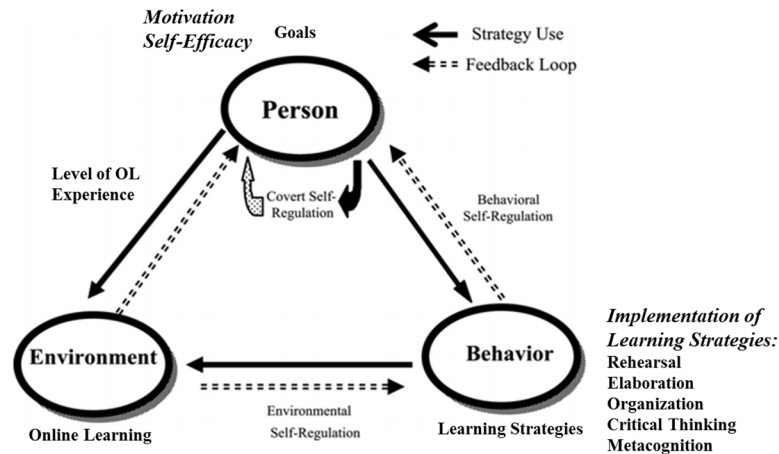


Figure 7. Modified to fit online learning-Three key forms of self-regulation. From “A Social Cognitive View of Self-Regulated Learning” Zimmerman, 1989, 81, p.330.

## STUDENT LEARNING STRATEGIES

Due to the autonomous and self-directed nature of online learning classes, effective use of self-regulated learning strategies is a skill necessary for student to be successful, particularly in courses which are 100% online (Barnard-Brak, Paton, and Lan, 2010). Unfortunately, not all students who enroll in online classes have acquired self-regulated learning strategies (Azevedo, 2005; Hu and Gramling, 2009).

Hence, a successful online student learner should possess some important knowledge including distance education technology, collaborative learning and communication skills. This is best emphasized by Arend (2007) as he indicated, “The learning strategies students use in a course ultimately influence their overall learning outcomes” (p. 4). In addition, the online student needs to have self-efficacy, which is a highly effective predictor of students’ motivation and learning; self-regulation, which focuses on self-corrective adjustment to complete a desire objective; and effective time-management. Also, strong academic self-concept, which means when an individual’s perception of self-efficacy in academic subjects. According to Zimmerman and Martinez-Pons (1986), another learning strategy that is very important for distance education

is self-regulation. Self-regulated learning characteristics include: (a) Students' use of metacognitive strategies, which is thinking about their thinking, (b) Students' management and control of their effort on academic tasks, and (c) The specific cognitive strategies students use to acquire new knowledge, remember, and understand content. Important theories that are significant in student learning are andragogical theories which are described below.

### **ANDRAGOGICAL THEORIES**

Merriam-Webster dictionary defines andragogy as the art or science of teaching adults. In an online environment, students can be provided with a highly organized structure, like in a traditional classroom, but in an online format, they can engage with it more freely, following any routine they wish according to their personal preferences and time allotments. As a result, they may have relatively more control over their learning process than in some traditional classrooms, although that is not always the case. Knowles (1968), argued that learning after childhood is competency-based, rather than an act of simply absorbing information, and, as an adult, learning is a natural part of human psychological and personality growth. He borrowed these notions from Carl Rogers, the humanistic psychologist. The following five defining questions of significant or experiential learning are important for adult students:

1. Does the experience need to have significant learning? Has a quality of personal involvement in which "the whole person in both his feeling and cognitive aspects [is] in the learning event."
2. Is the learning self-initiated? "Even when the impetus or stimulus comes from the outside, the sense of discovery, of reaching out, of grasping and comprehending, comes from within."

3. Is the learning pervasive? Which implies that significant learning “makes a difference in the behavior, the attitudes, perhaps even the personality of the learner”
4. Is the learning being evaluated by the learner? Which means that the learner knows “whether it is meeting his need, whether it leads toward what he wants to know, whether it illuminates the dark area of ignorance he is experiencing”
5. Is the learning meaningful? Does it have a holistic experience as stated, “When such learning takes place, the element of meaning to the learner is built into the whole experience” (Rogers, 1969, p. 5).

Ultimately, the online student needs to assume responsibility for his/her own continuing learning in this knowledge-based economy. Knowles (1968), states the five assumptions underlying andragogy describe the adult learner as someone who needs to have independent self-concept and who can direct his or her own learning. The adult learner should have accumulated significant life experiences throughout his/her life to facilitate learning and his or her experiences are reflected in his/her learning needs which are closely related to their changing social roles. Also, the adult learner has a learning that is elicited from previous experiences facilitating application of knowledge and is self-motivated to learn by internal rather than external factors.

Adult learners are enrolling in online learning as a prefer venue for increasing their credentials in colleges and universities, in particular First Generation, low socioeconomic, and non-traditional students. Moreover, education is established around life and especially some of the responsibilities of adulthood: supporting a family, rising children, and other commitments occur outside of the classroom (Cercione, 2008). According to Methvin (2012) and Zafft (2008), colleges and universities need to focus on the adult learner and need to design support systems to service this adult learners and first-generation groups. Adult learners reenter college for several

reasons including improved household income, career goals, desire for continuous self-improvement, career changes, loss of a job, and family motivation (Methvin, 2012). Regardless of the reason why adult learners reenter higher education, senior administrators and decision-makers need to make decisions that include these first-generation, and adult learner groups and provide institutional support systems that provide additional services for those students.

It is important to emphasize that andragogy theory originates from adult-specific to situational regardless if the situation is originated by an individual depending on the degree of self-direction. This acknowledgment by Knowles (1968) resulted in andragogy being defined more by the learning situation than by the learner. For Houle (1996, p. 30) what is noteworthy is that andragogy has informed educators of the fact that they “should involve learners in as many aspects of their education as possible and in the creation of a climate in which they can most fruitfully learn.” The proposed study uses a constructivist approach elaborated in the following section. The andragogy theory and learning strategies were reported to be correlated as adult learners have high levels of self-regulated learning, especially in the following learning strategies: rehearsal, elaboration, critical thinking, and metacognitive self-regulation (Colorado and Eberle, 2010, p. 9).

## **CHAPTER II SUMMARY**

This chapter presents a literature review which describes the development of online learning from its origins to the present in online education. The review explores the previous and current characteristics in online learning and student self-regulation theory and student learner in online learning. The review included the following topics: online education, attrition, learning strategies for online learners, characteristics of online learners, andragogical theories, and a theoretical framework for online learning. The following chapter will provide an in-depth explanation about how the proposed study was designed and conducted.

## CHAPTER III: METHODOLOGY

*The object of education is to teach us to love what is beautiful.*

**Plato**

### INTRODUCTION

The proposed research addressed the most frequent learning strategies used in online courses and the interaction effects between gender, college student's generational level, level of online learning experience and student use of learning strategies in an online format. For the proposed study the phenomenon of interest was the examination of student utilization and application of learning strategies in online courses and the context was a Hispanic Serving Institution (HSI) in the Southwest. For the proposed study there were two important bounded systems, first, online learning is mostly asynchronous (different time periods for some of the online faculty and students) except for chat sessions and some discussion boards and second, the selection of college students from a Hispanic Serving Institution (HSI) in the U.S. The Southwest (i.e., Arizona, New Mexico, Texas, and Oklahoma) is geographically isolated from any major urban metropolis, with more than 400 miles distance to other metropolitan cities. This Hispanic Serving Institution is located in the world's largest bi-national metropolitan area, totaling 2.5 million residents.

A study conducted by Arend (2007), indicates that online education is transforming from basic rehearsal strategies to more complex learning strategies. Where students' abilities to access and to utilize the information and available resources align to the demands of the workforce and requires higher education training to produce knowledge workers who can optimize resources to sharpen their skills rather than regurgitate mere facts. In this study, the researcher employed the

Motivated Strategies for Learning Questionnaire (MSLQ), but the instrument was modified to update the wording for online learning. Thus, providing a revised and updated information as to its validity for future research studies focusing on online learning. Since the modified MSLQ instrument was not included in Arend (2007), the original learning strategy questions were modified directly from its developer Pintrich (1990). The proposed study used a causal-comparative design approach as described in the following section.

## **RESEARCH QUESTIONS**

The proposed research project was guided by the following research questions:

1. Are there gender mean differences in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
2. Are there differences between first generation and 2<sup>nd</sup> generation college students in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs.
3. Are there differences between college student's level of online experience in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
4. Examine the 3 first-order interactions and their relation to the MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
  - Gender X Generational Level



- Gender X Level of Online Experience
  - Generational Level X Level of Online Experience
5. Examine the second-order interaction and its relation to the MSLQ learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?
- Gender X Generational Level X Level of Online Experience

## **RESEARCH DESIGN**

A causal-comparative study includes a number of dependent variables in the case of the present study it these variables were examined to determine interaction effects between gender, college student's generational level, level of online learning experience across the five MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) employed by college students in online learning as controlled by the student's self-reported GPAs. The causal-comparative study approach attempted to identify relationships among study variables with an attempt to determine consequences of differences that may already exist between or among groups of individuals. Although, we were studying these associations, the design differs from the correlational design since we are examining two or more groups and their interaction effects. Main effects are important factors to study and these included gender, generational level, and levels of online learning experiences.

Our sample size consisted of 644 participants out of the nearly 6,000 students enrolled in at least one online class in the Hispanic Serving Institution. This number only represented a small portion of the total student population of over six million students taking at least one online course in the United States.

## **PARTICIPANTS**

Students were selected using random sampling from a population of approximately 400 online courses per semester. The target population of course/faculty consisted of undergraduate online course only. This target population of course offering represents 400+ online courses on any given semester. The sample of interest for this study was targeted from all the distance education students taking at least one class fully online. For purposes of statistical power and representation of population of interest, the selected sample for this study was 644 students who provided responses in either the demographic section or the scale section or both. From these identified 644 students, only 582 students were utilized for this study because they provided complete and valid responses. 62 students were removed due to missing information or outliers using the DeCarlo's Macro procedure.

Although, the random sampling occurs at the course, the unit of analysis for all statistical analyses were at the student level. The researcher collaborated with the Dean of Extended University, who contacted the faculty through email. The instructors received two official invitations from the Dean of Extended University to participate. The inclusion criteria for the student to participate involved their enrollment in at least one 100% online course in the institution where this study was conducted. The online college student who self-selected and chose to participate in the study were instructed to complete the survey through the Qualtrics system created by the researcher at participating institution. Power analysis using GPower Software indicated that for a desired power of 0.90 and small effect size required a minimum of 150 participants using this statistical procedure and research design.

## INSTRUMENTATION

Students were given a survey with 31 items that emphasizes the learning strategies utilized by online learners of the Motivated Strategies for Learning Questionnaire (MSLQ) that has been previously validated by a previous study (Pintrich, et al., 1990; Arend, 2007) and is readily available from any search engine. The theoretical model and its operational definition of the MSLQ scales have been tested by the previous confirmatory factor analytical studies to support its construct validity. The MSLQ is widely used to compare student learning strategies to different educational variables in two distinct categories: learning strategies and self-regulated learning. Self-regulated learning theory addresses how students become proficient of their own learning processes (Zimmerman, 2001). The *self-regulated learning strategies* constitute the 5 different learning strategies in the MSLQ and these are known as:

1. ***Rehearsal*** strategies are used for activation of information in short-term memory rather than the acquisition of new information in long-term memory (regurgitation of facts).  
(i.e., “I make lists of important terms for this course and memorize the lists.”)
2. ***Elaboration*** is the association of internal connections between items known and items to be learned. Such as: paraphrasing, summarizing, and creating analogies.  
(i.e., “I try to apply ideas from course readings in other class activities such as lecture and discussion.”)
3. ***Organization***, which involves active processing and should result in increased outcome performance.  
(i.e., “I make simple charts, diagrams, or tables to help me organize course material.”)
4. ***Critical thinking***, which is the way in which a student utilizes previous knowledge to new situations in order to solve problems and reach decisions.

(i.e., “When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.”)

5. ***Metacognitive self-regulation***, which is the awareness, knowledge and control of one-self, which includes planning, monitoring, and regulating activities.

(i.e., “I try to change the way I study in order to fit the course requirements and instructor’s teaching style.”)

### **SCORING THE MSLQ SCALE**

Student self-reported responses were rated in a Likert-type scale of 1 to 7, from 1 (not at all true of me) to 7 (very true of me). Scale scores were constructed by calculating the overall total of each scale with their frequency of use of the five subscales include: Rehearsal (5 items), Elaboration (6 items), Organization (7 items), Critical Thinking (6 items), and Metacognition (7 items), self-regulation learning strategies. There some items marked as “reversed” use negative worded questions should be adjusted before individual’s score can be calculated. This instrument was originally validated by Pintrich et al., (1991). The scale correlations with final grade were statistically significant, albeit moderate, demonstrating predictive validity. The Cronbach’s alphas were considered moderate to robust, ranging from .52 to .93. Arend (2007) reported,

“Reliability coefficients for the revised questionnaire were deemed appropriate. Cronbach’s alphas for each subscale were: rehearsal, .745; elaboration, .783; organization, .751; critical thinking, .787; and meta-cognitive self-regulation, .788” (p. 7).

Thus, the MSLQ were deemed as a reliable and valid scale (Pintrich, Smith, Garcia, and McKeachie, 1993). Additional psychometric studies of the revised MSLQ in reference to its construct and predictive validity have been examined via confirmatory factor analysis with large samples of Singapore and the USA secondary students and college students, respectively.

(Rotgans & Schmidt, 2010; Liu, Wang, Koh, Chye, Chua, & Lim, 2012).

## **VARIABLES FOR THE STUDY**

The dependent variables (DV) for the study were five MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) of the MSLQ. More details on these variables' definitions were provided in the instrument section. The independent variables (IV) for this study were: Gender, college student's Generational Level, Level of Online learning experience.

The students who completed through Qualtrics the MSLQ survey and the demographic section of the questionnaire addressed the individual scale items, subscales (DVs) and personal demographics. The key independent variables included gender, college student's generational level, levels of online learning experience which were part of the demographics section of the survey. See appendix B.

## **DATA COLLECTION**

For present study, the researcher anticipated students self-reporting on the modified version of the Motivated Strategies for Learning Questionnaire (MSLQ). The MSLQ instrument and the demographic section was sent via email through Qualtrics (internal email generated system) on a Tuesday at 11:59 p.m. MST during late mid-semester. Survey period was for 17 days (five reminders were sent), the data collection ended at 11:59 p.m. MST on the 17<sup>th</sup> day. The information on the purpose of the study was included in the consent form and submitted online by the participants; the researcher administered both parts of the study through Qualtrics (online software that allows data collection). As part of the proposed study a student's demographic form was included in the study to develop a participants' profile (See Appendices B and C). The participants' anonymity and confidentiality was protected by requiring the student ID numbers rather than using names. Only the researcher had access to the data, which was

stored in a password protected computer in the researcher's office and was locked at all times.

All statistical analyses were conducted by the use of the latest version available of the Statistical Package for the Social Sciences (SPSS, 2017).

### **STATISTICAL ANALYSES**

The proposed study employed a factorial multivariate analysis of covariance (MANCOVA) statistical procedure to determine the relationship that the selected factors (groups) had on the simultaneous analysis of the selected outcome variables, Gall, Borg, & Gall (1996). The researcher utilized analysis of MANCOVA because is used to determine whether groups differ on more than one dependent variable can be explained by another difference that exists between the other variables (Gall et al., 1996, p. 394). The study started with descriptive statistics for all the IVs, DVs across key demographic variables in the study. In this case the MANCOVA determined the both the main and interaction effects between gender, college student's generational level, level of online learning experience, and the five MSLQ learning strategies employed by college students in online learning and controlled by the student's self-reported GPAs. The results from the proposed study were presented in tables and graphs reporting the descriptive statistics such as means and totals. In the event that students failed to respond to the survey, those students' data were not considered for analysis, and were categorized as non-responders or missing.

The MANCOVA procedure was used for deciding the effect of various grouping variables by examining participating students' self-reported use of learning strategies. If any of these main effect and interaction factors are deemed significant, these initial results were followed by univariate F-tests. The adjust

ted mean differences between the groups were evaluated with respect to each dependent variable. MANCOVA facilitates the data analysis by conceptualization and analysis the interrelation of the dependent variables and identify whether the variables in the study (IVs) differ from each other (Gall et al., 1996, p. 394). The importance of conducting a quantitative study is described by Creswell (2009) as he states that, “The quantitative data and results provide a general picture of the research problem” (p. 542). Prior to examining these effects, the various assumptions for using this statistical procedure were checked. All assumptions related to the proper use of this statistical technique were revised (i.e., Independence of observations, Multivariate Normality, Linearity, Homogeneity of Variance-Covariance Matrices, etc.). Descriptive statistics were generated and reported for all the outcome variables across the main effect factors and interactions.

### **CHAPTER III SUMMARY**

This chapter addressed the research design for the proposed study which is the explanatory sequential design. A modified version of the MSLQ was used to focus on what learning strategies are being used in online learning courses by students in a Hispanic Serving Institution (HSI) in the Southwest. MANCOVA was used to analyze the quantitative data to determine whether there were statistically significant differences between mean averages of between gender, college student's generational level, level of online learning experience and the five MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) employed by college students in online learning as controlled by the student's self-reported GPAs. In general, the proposed study intended to increase the knowledge-base in this field regarding the self-regulation learning strategies used by undergraduate students in online learning environment.



## CHAPTER IV: RESULTS

*Tell me and I forget. Teach me and I remember. Involve me and I learn.*

**Benjamin Franklin**

### INTRODUCTION

This research project addressed students' most frequent learning strategies used in online courses. Additionally, the main and interaction effects between gender, college students' generational level and level of online learning experience were examined. Our final sample size consisted of 644 participants out of the nearly 6,000 students enrolled in at least one online class in the Hispanic Serving Institution during the spring 2018 semester. This number represents only a small portion of the total student population of over six million students taking at least one online course in the United States. After inspection of these responses and the necessary data screening (i.e., inspection of missing value patterns, outliers, etc.), the total valid responses used in most of the proceeding analysis was 582.

Participating students were tasked in completing an instrument with 31 items that assessed the learning strategies utilized by online learners plus additional relevant demographic variables. The Motivated Strategies for Learning Questionnaire (MSLQ) has been previously validated in previous studies (Pintrich, et al., 1990; Arend, 2007). A causal-comparative research design was used to determine main and interaction effects between gender, college students' generational level, level of online learning experience across the five MSLQ learning strategies subscales (i.e., Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) employed by college students in online learning and controlled by the student's self-reported cumulative GPA. The causal-comparative study approach attempted to examine

relationships among study variables with an attempt to determine consequences of differences that may already exist between or among groups of college level individuals. Although, we were studying these associations, the design differs from the correlational approach since we are examining two or more groups and their main and interaction effects. The dependent variables (DV) used for the study were the total scores for the five MSLQ learning strategies-subscales. The independent variables (IV) for this study were: gender, college students' generational level, and level of online learning experience. These variables were part of the demographics section of the survey. See appendix B additional pertinent demographic variables collected.

### **STATISTICAL ANALYSES**

The researcher utilized analysis of MANCOVA (Gall et al., 1996, p. 394). In MANCOVA, we assess for statistical differences on multiple continuous dependent variables by an independent grouping variable, while controlling for the effects of a covariate variable. This is important because the analysis considers the covariates' effect on the relationship between the independent grouping variable and the set of continuous dependent variables to make statistical adjustments or control.

Initially, the collected data was screened for any inaccuracies in the data file including missing data, detection of outliers, distributional assumptions such as univariate and multivariate normality, linearity, homoscedasticity, and equality of variance-covariance matrix, and equality of slopes.

These results were presented in tables reporting the descriptive statistics such as means, standard deviations, and percentages. In the event that students failed to respond to the survey, those students' data were not considered for analysis, and these were categorized as non-responders or missing. All distributional assumptions related to the proper use of this statistical

technique were examined and reported below. A quick review of the internal consistency of the MSLQ's reliability coefficients was conducted. The Cronbach's alphas ( $N = 644$ ) for each subscale yielded the following results: Rehearsal, 0.73; Elaboration, 0.75; Organization, 0.70; Critical Thinking, 0.71; and Metacognitive self-regulation, 0.70. These Cronbach's alpha results are consistent with previous studies (Pintrich, et al., 1990; Arend, 2007).

## **DATA SCREENING**

**Examination of Missing Data:** The total number of students who at least opened the online survey, indicated that 644 attempted to complete the questionnaire. It became apparent that 62 respondents failed to even complete the demographic section. It appears that these students only log in and out, thus, these participants were labeled as non-respondent or missing and were dropped from any further analysis reducing the number of completed surveys to 582.

**Detection of Outliers:** As part of the data screening process, analysis outliers were examined with the new sample data set using the 644 completed surveys. At the univariate level, the criteria for detecting if a response is considered an outlier of lying outside the range of -3 to 3 standard deviations was employed using the SPSS EXAMINE procedure. A total of 21 were deemed as outliers and were the cases were deleted from the data set. A further examination of multivariate outliers using the recommended process by DeCarlo (2007) via the Mahalanobis distance resulted in an additional 41 cases to be considered as outliers, thus, resulting in a final response set of 582 cases for the present study.

## **STATISTICAL ASSUMPTIONS**

1. **Independent Random Sampling:** the statistical procedure used for this study MANCOVA, assumes that the observations are independent of one another, there is no specific pattern for the sample selection, and that the sample is completely random. Although the study did not

employed a random process of selection, the data collection procedures involved a process of selection that may be considered more as a sampling of convenience and may shadow the veracity of meeting this assumption. However, the completion of the survey by more than 800 students who took the time and made the effort to participate may minimize potential deleterious effects due to the meeting of this assumption and may for the proper use of this statistical procedure.

2. **Level and Measurement of the Variables:** MANCOVA assumes that the independent variables are categorical and the dependent variables are continuous or scale variables. Covariates can be either continuous, ordinal, or dichotomous. For the independent variables this assumption is clearly met since gender, generational level and level of line experience were collected in a priori format as groups or categories while the dependent variables derived from the MSLQ instrument are also considered as interval or ratio measurement scale. The five subscales in the instrument were developed using the total value rather than their average value.
3. **Absence of multicollinearity:** The dependent variables cannot be too correlated to each other. Table 1 presents the intercorrelations among the study dependent variables including the total motivation value. The values for all the DVs and the covariate are below  $r = .90$ , indicating that there is no strong correlation among each other (Tabachnick & Fidell, 2012).

Table 1

Intercorrelations among the dependent variables from the MSLQ instrument and the covariate.

	Rehearsal	Elaboration	Organization	Critical Thinking	Metacognition	GPA <sup>a</sup>
Rehearsal	1					
Elaboration	0.36	1				
Organization	0.56	0.47	1			
Critical Thinking	0.12	0.51	0.30	1		
Metacognition	0.48	0.56	0.54	0.49	1	
Cumulative GPA	-0.18	0.06	-0.08	0.10	-0.06	1
Mean	18.91	31.35	18.95	23.93	56.12	
Standard Deviation	4.65	5.20	4.55	4.82	8.24	

N = 582, <sup>a</sup>N = 566

4. **Multivariate Normality:** The normality assumption was analyzed at the univariate and multivariate level. Due to the sample size of 582 participants the formal tests of normality the Shapiro-Wilk's W and the Kolmogorov-Smirnov Test for univariate normality were employed and produced results that indicated that three of the five learning strategies subscale variables were not meeting this assumption. Because these procedures tend to be highly sensitive to issues of large sample size, the assumption was not met at the univariate level. However, a more robust test for multivariate normality developed by DeCarlo (1997) was used to examine this assumption. This SPSS macro gave partial confirmation of normal distributional patterns at the univariate level, as shown in the following results by the examination of the dependent variables skewness and kurtosis results in Table 2 below:

Table 2

## Measures and Tests of Skewness &amp; Kurtosis

DV	Skewness		Kurtosis	
	Z1	<i>p</i> -value	Z2	<i>p</i> -value
Elaboration	<b>-5.4342</b>	.0000	0.9687	.3327
Rehearsal	<b>-2.6884</b>	.0072	-1.7034	.0885
Organization	<b>-4.0361</b>	.0001	-1.2340	.2172
Critical Thinking	-0.4259	.6702	-0.0320	.9745
Metacognition	-1.5816	.1137	0.1865	.8521

N=582; Z1 = z-score value for skewness; Z2 = z-score value for kurtosis

The normality assumption appears to have been met at the univariate level for all the DVs by the examination of the kurtosis results, however, only two of the 5 dependent variables produced a nonsignificant results (met assumption) by the examination of the skewness results (i.e., critical thinking and metacognition learning strategies). Further examination of the data at the multivariate level, the DeCarlo's SPSS macro produced again a partial confirmation of this assumption being met using the the Small's test (1980). The results of this analysis produced a Chi-Square value of 5.63 with 5 degrees of freedom and a nonsignificant result ( $p = 0.34$ ). Although multivariate normality assumption appear to have not been met conclusively, a group of researchers have indicated that for large sample sizes the MANCOVA procedure is robust to this type of outcome (DeCarlo, 1997; Norman, 2010; Tabachnick & Fidell, 2012; Hahs-Vaughn, 2017).

5. **Homogeneity of Variance–Covariance Matrix:** The variance of dependent variables scores within each other is a different approximation of the same population variance. For this

MANCOVA the Box's M value of 207.747 was associated with a p value of 0.06, which was non-significant based on Huberty and Petoskey's (2000) guideline (i.e.,  $p < 0.05$ ). Thus, the covariance matrices between the groups were assumed to be equal for the purposes of the MANCOVA. Moreover, the Levene's test of equality of error variances, provided three non-significant p values at the univariate level: Rehearsal  $F(11, 547) = 2.02, p = 0.02$ , Elaboration  $F(11, 547) = 1.22, p = 0.27$ , Organization  $F(11, 547) = 2.41, p = 0.01$ , Critical Thinking  $F(11, 547) = 0.41, p = 0.95$ , Metacognition  $F(11, 547) = 0.88, p = 0.56$ . Thus, indicating that the assumption was partially met, and the variance is equal across groups. Except for the rehearsal and organization learning strategies because they were statistically significant violating the assumption. Furthermore, due to these observed results, investigations on this matter from authors such as Box (1953), (1954b); Tabachnick & Fidell, (2012), Algina and Olejnik, (1984) indicate that the univariate F-test are robust in relation to this assumption when the samples sizes are large and balanced. The only group which exhibited unbalanced sample sizes was gender (3:1 ratio) and a non-parametric statistical procedure Kruskal-Wallis (1952) was used to corroborate this set of analyses on those dependent variables of concern.

6. **Relationship between covariate(s) and dependent variables:** in choosing what covariates to use, it is common practice to assess if a statistical relationship exists between the covariate(s) and the dependent variables; this can be done through correlation analyses. For the final data set ( $n = 582$ ), the inter-correlations among the dependent variables and the covariate indicate small to no correlation among them, see Table 1.

7. **Linearity.** Examination of the bivariate scatterplots for all the dependent variables indicated that there was a linear pattern among 8 out of the 10 pairs of scatterplot exhibited linear behaviors. Thus, one can consider that this assumption is met. See Figure 8 for scatterplots.

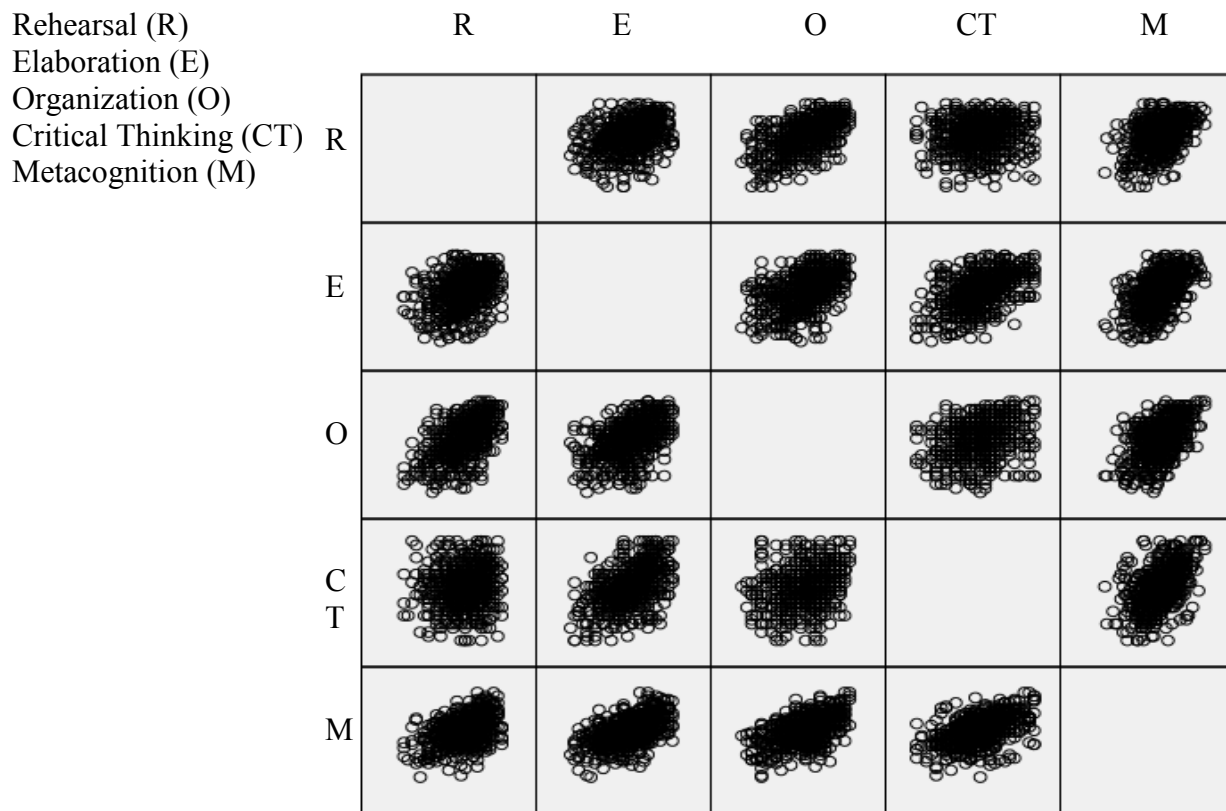


Figure 8. Linearity Among Variables (Scatterplot).

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A nonsignificant Box's M test revealed that normality, homogeneity of variance and covariance matrices assumptions of MANCOVA were met ( $p > 0.05$ ). Descriptive statistics were generated and reported for all the outcome variables across the main effect factors and interactions.



## **STUDENT DEMOGRAPHICS**

Student demographics and the MSLQ Instrument were collected from a validation sample of 644 students in the spring 2018; there were 64 missing or non-respondent students. Of the students who responded the demographic questions, 26% were males (N = 166) and 74% females (N = 476). The student classification was the following: freshman 9% (N = 57); sophomore 17% (N = 106); juniors 23% (N = 151); seniors 26% (N = 167); Master's 20% (N = 131); Doctoral <1% (N = 3). In terms of ethnicity the sample population consisted of: African American 5% (N = 34); Asian American 2% (N = 13); Caucasian 17% (N = 107); Native American <1% (N = 3); Hispanic 73% (N = 469).

## **DESCRIPTIVE STATISTICS**

Table 4 shows the descriptive statistics of students participating in the online learning study at a Hispanic Serving Institution in the Southwest. The male students participation in the study was 26% compared to 74% of female students, this translates 1:3 ratio of female taking at least one fully online class. There is a 48% of First Generation students and 52% of Continuous Generation students enrolled in distance education in this HSI. The composition of student's online learning experience is evenly distributed: 33% of students with less experience have taken less than 3 courses; 40% of the students have completed 3-5 online classes; 27% of students have enrolled in 6 or more distance education courses. Interestingly, 87% of the students commuted, while only 13% of students did not drive to campus. As shown in Table 3:

Table 3

## Descriptive Statistics for Online Learning and Use of Learning Strategies

<u>Independent Variables</u>	<u>N</u>	<u>%</u>
<u>Levels</u>		
<u>Gender</u>		
Male	140	25
Female	419	75
<u>Generational level</u>		
First Generation	267	48
Continuous Generation	292	52
<u>Level of OL experience</u>		
Less Experienced (0-2)	180	32
Somewhat Experienced (3-5)	224	40
Highly Experienced (>6)	155	28
N = 559		

The research questions for the online learning study and use of learning strategies were answered by our MANCOVA statistical procedure.

### Research Questions Results

A 2 x 2 x 3 between-subjects multivariate analysis of covariance (MANCOVA) was performed on five dependent variables associated with college online learners and learning strategies: as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation). Independent variables were Gender, Generational level, and Level of Online Experience.

IBM SPSS MANCOVA procedure was used for the analyses with the sequential adjustment for non-orthogonality. Order of entry of IVs was gender, generational level, and level of online experience. Total N= 644 was reduced to 582 with by removal of the outliers and incomplete responses. However, due to loss of data from twenty-three respondents the new total sample size of 559 was analyzed using this procedure. Results of its assumptions was mostly satisfactory as described above. The covariate, GPA, was judged to be reliable for this covariance analysis.

With the use of Wilks' Criterion, the combined five DVs were significantly related to the three independent variables as adjusted by the covariate, with an approximate exact  $F(5, 542) = 5.00, p < 0.001$ , partial  $\eta^2 = 0.05$ .

Examination of the main effects produced the following results, For the Gender independent variable, the use of Pillai's Trace statistics is justified due to the reported violation of the homogeneity of variances (Tabachnick & Fidell, 2012). The approximate exact F observed produced a significant results  $F(5, 542) = 4.46, p < .001$ , partial  $\eta^2 = 0.04$ . In order to ascertain the effect that generational levels had on the use of these strategies, the multivariate results using the Wilk's criterion indicated a significant result. The approximate exact F observed was  $F(5, 542) = 2.42, p < 0.05$ , partial  $\eta^2 = 0.02$ . Finally, for the three levels of online learning experience independent variable, the Wilks' criterion indicated a significant result, also. The approximate exact F observed was  $F(10, 1086) = 4.23, p < 0.001$ , partial  $\eta^2 = 0.04$ . Examination of the first- and second-order interaction effects among the three independent variables yielded non-significant results at this stage of the analysis.

## Follow-up Univariate Tests Results

In order to further examine the effect of the independent variables across the five dependent variables individually, a series of univariate ANOVA tests were performed to address the study research questions with a similar level of significance at the 0.05 from previous analyses.

### **MAIN EFFECT RESULTS:**

- 1. Are there gender mean differences in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?*

The first question was designed to clarify whether there was a significant effect in the use of self-regulation learning strategies by male or female students. Upon examination of the analysis of variance across the five dependent variables, two of these learning strategy variables produced a significant difference among males and females: The learning strategy of Rehearsal  $F(1, 546) = 3.74, p < 0.05, \eta^2 = 0.01$  and the Critical Thinking variable  $F(1, 546) = 13.67, p < 0.05, \eta^2 = 0.02$ . However, three DVs had no significant difference among males and females: Elaboration  $F(1, 546) = 1.09, p = 0.30$ , Organization  $F(1, 546) = 0.07, p = 0.79$ , Metacognition  $F(1, 546) = 0.10, p = 0.75$ . The descriptive statistical results for this effect can be seen on Table 4.

Table 4

Gender Mean Differences in the use of Learning Strategies

<u>Dependent Variable</u>	<u>Mean</u>	<u>Std. Deviation</u>
Rehearsal		
Male	18.23	4.39
Female	19.13	4.71
Elaboration		
Male	31.59	4.65
Female	31.25	5.38
Organization		
Male	18.81	4.30
Female	18.98	4.63
Critical Thinking		
Male	25.05	4.82
Female	23.54	4.78
Metacognition		
Male	55.66	7.85
Female	56.26	8.38

Male (N = 146); Female (N = 434)

2. *Are there differences between first generation and 2<sup>nd</sup> generation college students in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs.*

The second research question was developed to investigate whether there were significant differences between First Generation and Continuous Generation students in the use of learning strategies. The only learning strategy mean difference by both Generational level students was Organization  $F(1, 546) = 10.58, p < 0.01, \eta^2 = 0.02$  with statistically significant mean differences. Nonetheless, the other 4 learning strategy had no significant difference among First

Generation and Continuous Generation Students: rehearsal  $F(1, 546) = 1.20, p = 0.28$ , Elaboration  $F(1, 546) = 3.00, p = 0.08$ , Critical Thinking  $F(1, 546) = 0.28, p = 0.60$ , Metacognition  $F(1, 546) = 2.90, p = 0.90$ . The descriptive statistical results for the two levels of the generational effect can be seen on Table 5.

Table 5

Generational Level Mean Differences in the use of Learning Strategies

<u>Dependent Variable</u>	<u>Mean</u>	<u>Std. Deviation</u>
Rehearsal		
First Generation	19.36	4.11
Continuous Generation	18.49	5.06
Elaboration		
First Generation	31.84	5.10
Continuous Generation	30.90	5.25
Organization		
First Generation	19.88	3.98
Continuous Generation	18.10	4.86
Critical Thinking		
First Generation	24.11	4.73
Continuous Generation	23.76	4.91
Metacognition		
First Generation	57.20	7.90
Continuous Generation	55.14	8.43
First Generation (N = 277); Continuous Generation (N = 305)		

3. *Are there differences between college student's level of online experience in the use of learning strategies as measured by the MSLQ (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?*

The third research question was developed to investigate whether there were significant differences between student's levels of online experience in the use of learning strategies. Examination of this result indicated that two of these learning strategy variables produced a significant difference among levels of online experience: The learning strategy of Elaboration  $F(2, 546) = 11.33, p < 0.01, \eta^2 = 0.04$  and the Critical Thinking variable  $F(2, 546) = 11.12, p < 0.01, \eta^2 = 0.04$ . In order to determine where these significant results are located, a post hoc examination among the three pairwise mean comparisons were conducted using the Tukey's test. The results for both significant learning strategies measures indicated mean differences between those students with less and moderate experience against those with high experience in online learning. However, three DVs had no significant difference among different levels of online experience. These are the actual results for them. Rehearsal  $F(2, 546) = 0.67, p = 0.52$ , Organization  $F(2, 546) = 0.22, p = 0.80$ , Metacognition  $F(2, 546) = 2.75, p = 0.70, \eta^2 = 0.01$ . The descriptive statistical results for this effect can be seen on Table 6.

Table 6

College Student's Level of Online Experience Mean Differences in the use of Learning Strategies

<u>Dependent Variables</u>	<u>Mean</u>	<u>Std. Deviation</u>
Rehearsal		
Less Experienced (0-2)	19.12	4.29
Somewhat Experienced (3-5)	18.84	4.71
Highly Experienced (>6)	18.66	4.95
Elaboration		
Less Experienced (0-2)	30.03	5.33
Somewhat Experienced (3-5)	31.33	5.03
Highly Experienced (>6)	33.01	4.88
Organization		
Less Experienced (0-2)	18.77	4.49
Somewhat Experienced (3-5)	18.92	4.31
Highly Experienced (>6)	19.15	4.96
Critical Thinking		
Less Experienced (0-2)	23.35	4.389
Somewhat Experienced (3-5)	23.44	4.811
Highly Experienced (>6)	25.34	5.126
Metacognition		
Less Experienced (0-2)	55.39	7.651
Somewhat Experienced (3-5)	56.03	8.445
Highly Experienced (>6)	57.08	8.628
Less Experienced (N = 190); Somewhat Experienced (N = 230); Highly Experienced (N = 157)		

In the factorial designed employed here, not only is one interested in the main effects but also the interacting effects that these grouping variables may have among each other, there are three first-order interaction effects (i.e., gender by generational level, gender by online learning experience levels, and generational level by online learning experience levels) while only one second-order interaction effect among all these variables. The next section presents the obtained results on these interactions.



4. *What is the first-order interaction gender by generational levels and their relation to the MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?*

This fourth research question was designed to investigate whether there were significant differences between Gender and Generation level in the use of learning strategies. For this interaction, there were no statistically significant mean differences in the first-order interactions, Gender, and Generation level and the five DVs; Rehearsal  $F(1, 558) = 0.58, p = 0.44$ , Elaboration  $F(1, 558) = 0.10, p = 0.75$ , Organization  $F(1, 558) = 0.48, p = 0.48$ , Critical Thinking  $F(1, 558) = 0.43, p = 0.52$ , Metacognition  $F(1, 558) = 0.38, p = 0.54$ .

5. *What is the first-order interactions: Gender and Level of Online Experience and their relation to the MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?*

The fifth research question was intended to inquire whether there were significant differences between Gender and Level of Online Experience in the use of learning strategies. There were no statistically significant mean differences in the first-order interactions: Gender, Level of Online Experience, and the five DVs; Rehearsal  $F(2, 558) = 0.31, p = 0.74$ , Elaboration  $F(2, 558) = 0.15, p = 0.86$ , Organization  $F(2, 558) = 0.24, p = 0.79$ , Critical Thinking  $F(2, 558) = 2.45, p = 0.08$  (Marginal Significant), Metacognition  $F(2, 558) = 1.39, p = 0.25$ . It seems that the effect was only at the main effect level, however, inspection of some of the interactions between gender, generational level and level of experience indicated slight mean difference at the cell level. As illustrated in Figure 9, those with high levels of online learning experience produced a mean difference in the way male and female students reported their utilization of the critical thinking strategy.

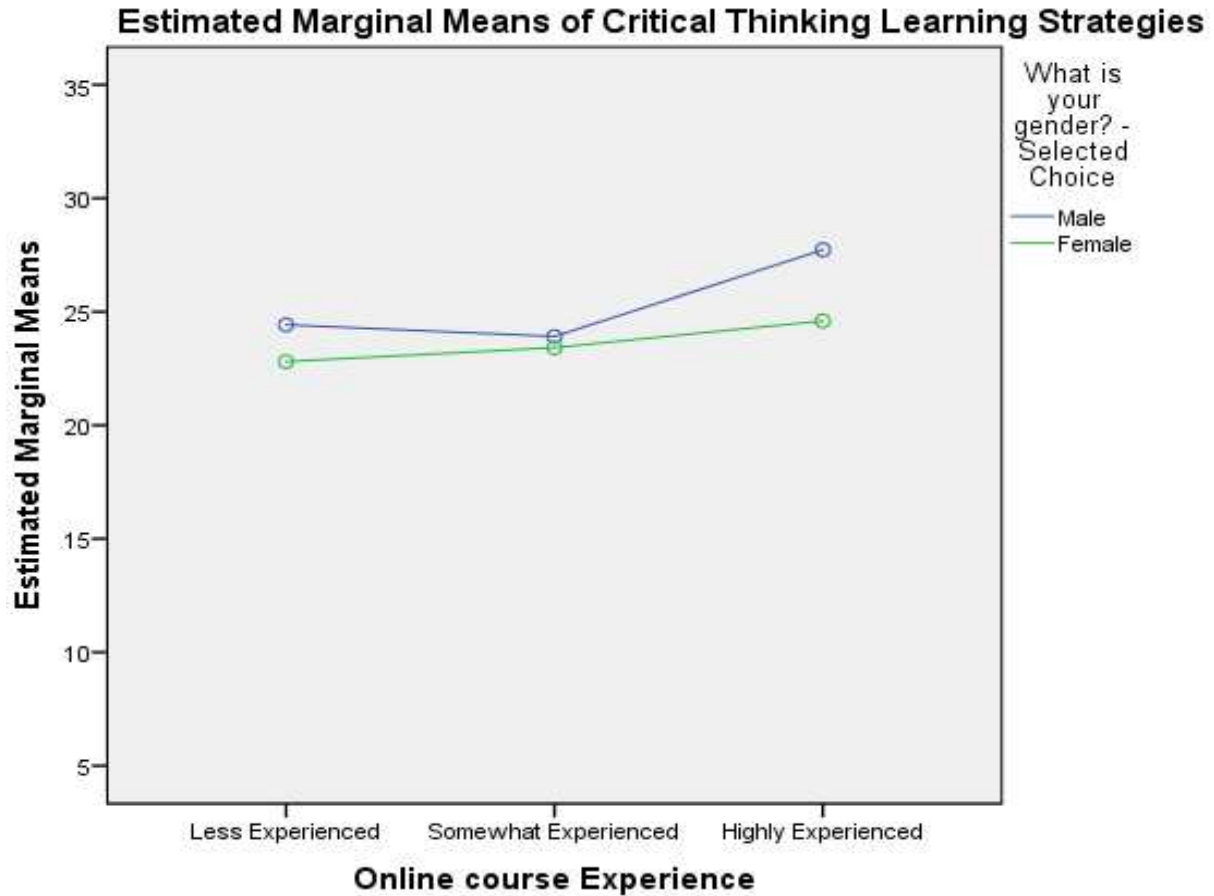


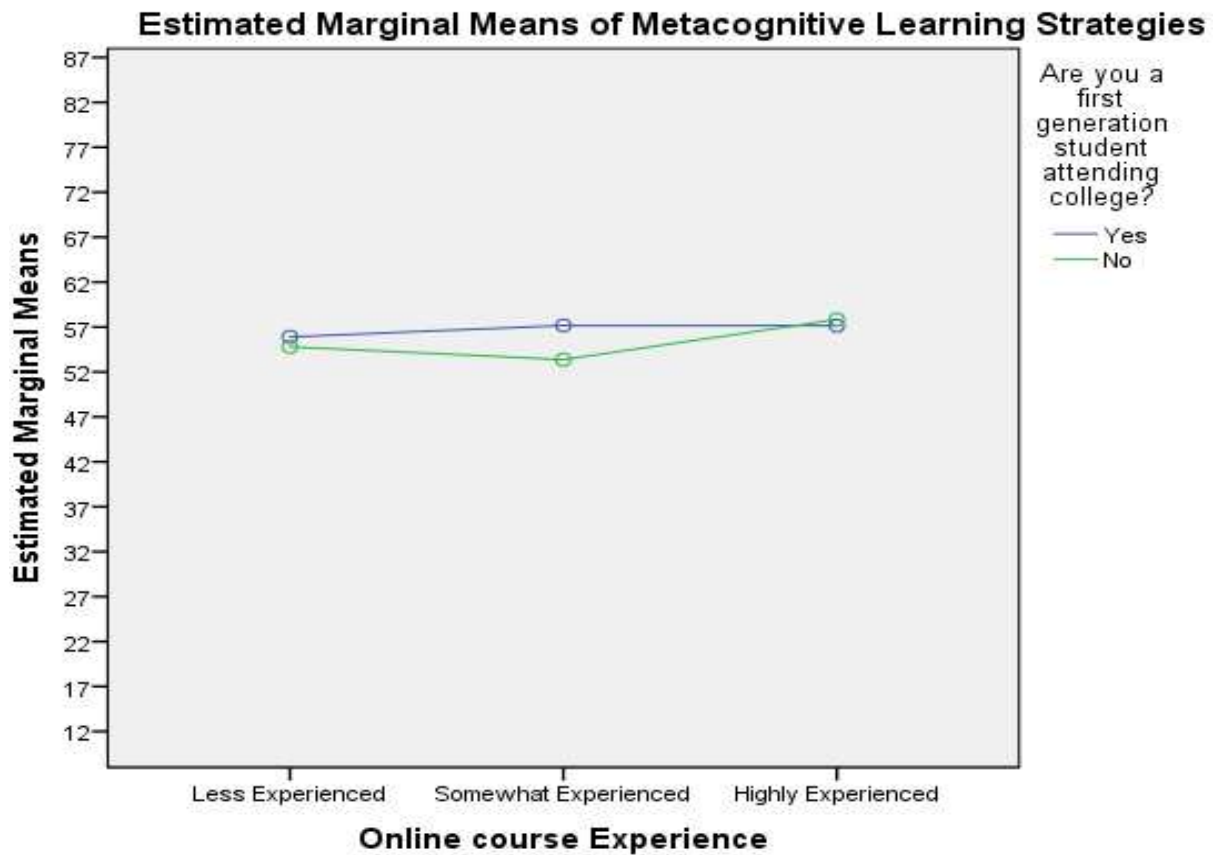
Figure 9. Gender and Levels of Online Experience Mean Differences Interactions in the use of Critical Thinking Learning Strategies.

6. What is the first-order interactions: Generational Level, Level of Online Experience and their relation to the MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?

The sixth research question was constructed to find whether there were significant differences between Gender and Level of Online Experience in the use of learning strategies. There were no statistically significant mean differences in the first-order interactions, Generational Level, and Level of Online Experience and the five DVs; Rehearsal  $F(2, 558) = 0.89$ ,  $p = 0.41$ , Elaboration  $F(2, 558) = 0.37$ ,  $p = 0.69$ , Organization  $F(2, 558) = 1.27$ ,  $p = 0.79$ , Critical Thinking  $F(2,$

558) = 1.29,  $p = 0.28$ , Metacognition  $F(2, 558) = 2.45$ ,  $p = 0.08$  (Marginal Significant). It seems that the effect was only at the main effect level, however, inspection of some of the interactions between gender, generational level and level of experience indicated slight mean difference at the cell level. As illustrated in Figure 10, those students with some levels of online learning experience appear to indicate a slight mean difference in the use of metacognitive strategies between first and continuous generational students.

*Figure 10. Generational Level and Levels of Online Experience Mean Differences Interactions in the use of Metacognition Learning Strategy.*



7. *What is the second-order interaction among gender by generational level by level of online experience and its relation to the MSLQ learning strategies as measured by the MSLQ*

*(Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) as controlled by the student's self-reported GPAs?*

Upon examination of this interaction effect, the Gender, Generational Level and Level of Online Experience interaction produced no statistically significant mean differences across the five learning strategy variables.

#### SUPPLEMENTARY ANALYSES OF SCALE ITEMS

The following tables report the most used (in bold) strategies for online college students for the 31 MSLQ items separated by the individual learning strategy (i.e., Rehearsal, Elaboration, Organization, Critical Thinking, and Metacognitive) and reported by mean differences and standard deviation. For the Rehearsal strategy the item dealing with the paying close attention to what concepts are not being understood reported the highest use by students in this online format, see Table 8.

Table 8

#### Rehearsal Learning Strategies Itemized Mean Differences

<u>Item</u>	<u>Mean</u>	<u>Std. Deviation</u>
5	4.39	1.87
9	5.07	1.49
18	5.19	1.44
<b>28<sup>1</sup></b>	<b>5.23</b>	<b>1.28</b>
Scale	4.97	1.52

(N=582); <sup>1</sup>Most prevalent used learning strategy; 1= not at all true of me to 7=very true of me.

Table 9 reports the most utilized item by students under this environment dealt with students being able to relate known material with the previously acquired material as a representation statement for the Elaboration strategy.

Table 9

Elaboration Learning Strategies Itemized Mean Differences

<u>Item</u>	<u>Mean</u>	<u>Std. Deviation</u>
13	5.59	1.30
20	5.31	1.34
<b>22<sup>1</sup></b>	<b>5.79</b>	<b>1.11</b>
24	4.08	1.82
25	5.41	1.28
31	5.17	1.58
Scale	5.23	1.41

(N=582); <sup>1</sup>Most prevalent used learning strategy; 1= not at all true of me to 7=very true of me.

For the Organization strategy, students indicated a process of acquiring new ideas by extracting the most important ideas or concepts followed by a statement dealing with students outlining important material that helped them organize their thoughts, see Table 10.

Table 10

Organization Learning Strategies Itemized Mean Differences

<u>Item</u>	<u>Mean</u>	<u>Std. Deviation</u>
1	4.85	1.77
<b>7<sup>1</sup></b>	<b>5.83</b>	<b>1.12</b>
11	3.66	1.92
21	4.61	1.74
Scale	4.74	1.64

(N=582); <sup>1</sup>Most prevalent used learning strategy; 1= not at all true of me to 7=very true of me.

Participants reported that they tend to play around with own ideas as a mean for relating their own learning of new concepts in the course as well as a close examination to support available evidence. Table 11 shows these two highly utilized items in this scale.

Table 11

Critical Thinking Learning Strategies Itemized Mean Differences

<u>Item</u>	<u>Mean</u>	<u>Std. Deviation</u>
4	4.19	1.76
<b>10<sup>1</sup></b>	<b>5.19</b>	<b>1.32</b>
12	4.69	1.47
<b>23</b>	<b>5.17</b>	<b>1.34</b>
26	4.69	1.43
Scale	4.79	1.46

(N=582); <sup>1</sup>Most prevalent used learning strategy; 1= not at all true of me to 7=very true of me.

Table 12

Metacognition Learning Strategies Itemized Mean Differences

<u>Item</u>	<u>Mean</u>	<u>Std. Deviation</u>
2	2.95	1.74
3	3.52	1.74
<b>6<sup>1</sup></b>	<b>6.03</b>	<b>1.12</b>
8	4.87	1.55
14	5.44	1.53
15	4.81	1.56
16	5.22	1.50
17	3.29	1.83
19	4.83	1.47
27	4.26	1.75
29	5.25	1.51
30	4.68	1.59
Scale	4.56	1.57

(N=582); <sup>1</sup>Most prevalent used learning strategy; 1= not at all true of me to 7=very true of me.

The utilization of metacognitive strategies yielded a high use of a strategy focused on student's referral to previous material learned to clarify newly acquired material, see Table 12 for all the items in this learning strategy. A more detailed interpretation of these findings is found in chapter V. A table summarizing all the 31 items is in Appendix E.

## **CHAPTER IV SUMMARY**

This chapter investigated 582 student participants in a causal-comparative research design used to determine main and interaction effects between Gender, college student's Generational Level, Level of Online learning experience across the five MSLQ learning strategies subscales (i.e., Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation) employed by college students in online learning and controlled by the student's self-reported cumulative GPA. After careful examination of the following assumptions: a  $2 \times 2 \times 3$  between-subjects multivariate analysis of covariance (MANCOVA) was performed to determine mean differences between and across various levels of the selected independent group variables. Evidence of these mean differences for various learning strategies was detected on the main effect factors but not for any of the interaction effects. Chapter V will explain the findings, implications, recommendations, and conclusions of this study about the use on learning strategies in online learning.



## CHAPTER V: DISCUSSIONS AND CONCLUSIONS

*Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution.*

**Albert Einstein**

The purpose of this study was to discover what learning strategies are being used in online courses by college students in a Hispanic Serving Institution in the U.S. Southwest. The study was conducted in the spring 2018 semester and a survey questionnaire was administered to more than 600 college students taking at least one online class. This chapter begins with a findings' interpretations description, followed by a summary. Moreover, a detailed discussion of the results aligned with the research questions will be presented. Limitations associated with the study are presented and general conclusions and implications for research and practice are made. In addition, final recommendations for future research are suggested.

### MAIN FINDINGS AND INTERPRETATIONS

Descriptive information about the sample: The final sample of students included 582 complete responses and was used to arrive at the present findings. There was a balanced number of students reporting both generational levels and levels of online experience; however, there were more female than male students in this final sample. The relationship among the dependent variables of interest were moderate to highly correlated justifying the use of the multivariate analysis of covariance with low to moderate intercorrelations among the dependent variables and the selected covariate, student's GPA. The mean total results across the key grouping levels for the independent variables reported very similar mean differences corroborating the lack of statistical significance for several of the learning strategies outcome variables.

Inferential statistical results include the findings obtained from the examination of the multivariate analysis across the five dependent variables and the main and interaction effects as adjusted by the presence of the GPA covariate. The various multivariate measures indicated that there were main effect mean differences including the covariate across the five dependent variables. Nonetheless, the overall effect sizes for the main effect results were considered small, it was only observed a 4% of the total variance accounted. The following section provides an overview of the specific observed findings and their interpretations in the context of other extant research.

The first question was designed to clarify whether there was a significant effect in the use of self-regulation learning strategies by male or female students. From the examination of the five learning strategies, only two strategies yielded statistically significant results. Rehearsal was slightly more used by female than male online college students based on their mean differences. This finding indicates that this strategy of rehearsal could be slightly more utilized by females in online classes. This may also be illustrated as memorization of facts, which seems to be a persistent learning strategy among college students. This is consistent with Lombardi (2008) as he states that online college students need to apply the right set of tools and strategies that go beyond regurgitation (Lombardi, 2008). Interestingly for our findings, this was the second learning strategy that was found to be statistically significant for our research. In the case, the male students reported a slightly higher use of the strategy than their female counterpart. In today's competitive job market, students need to be able to solve real-world problems that are evolving faster and significantly more complex in real-time (Dede et al., 2005). Moreover, there were three other learning strategies with no significant differences detected among males and females: Elaboration, Organization, and Metacognition. Those results provided

some degree of certainty that the online college students are constantly regulating these learning strategies. As new online programs and courses are developed, it is important to consider that online student learners require unique strategies, in particular, critical thinking and metacognitive strategies for online learning based on this study (Clinefelter & Magda, 2013).

The second research question was proposed to investigate whether there were significant differences between First Generation and Continuous Generation students in the use of learning strategies. The only learning strategy mean difference by both Generational level students was Organization with statistically significant mean differences. Organization was to slightly more used by First Generation than Continuous Generation college students. The fact that there was more evidence of the use of the Organization strategy among First Generation students appears to indicate that these students rely on basic organizational tools to navigate, not just college, but in particular, this online learning environment as they self-regulate their own learning. In addition to this observation, this strategy requires deeper higher order thinking and processing, some of the characteristics are: selection of main ideas from text, outlining the text or materials to be learned, organization, and selection of materials. Compared to the Rehearsal strategy, Organization strategies have indicated a deeper understanding of the new knowledge acquired (Weinstein & Mayer, 1986; Pintrich, 1999). Contrary with Richardson and Skinner (1992), our findings demonstrated a slight mean difference in the use of the Organization strategy in First Generation versus Continuous Generation online participants. This small observed difference could be attributed to the fact that online learning requires for most college students not to memorize facts since the content is readily available 24/7 to them, but to solve more complex real-problems; and, unexpectedly the First Generation students are using the Organization strategy to assimilate the new knowledge presented (i.e., “I make simple charts, diagrams, or

tables to help me organize course material.”). This in turn, provides a very favorable scenario for incoming First Generation college students as they enter higher education and the online environments where those students adjust their self-regulation active learning and increase outcome performance. Nonetheless, the other four learning strategies reported no statistically significant differences among First Generation and Continuous Generation Students: Rehearsal, Elaboration, Critical Thinking, and Metacognition learning strategies. In turn, these results may also provide some degree of certainty that the online college students are constantly adjusting these learning strategies.

The third research question was developed to investigate whether there were significant differences between student’s levels of online experience in the use of learning strategies. Examination of this result indicated that two of these learning strategy variables produced a significant difference among levels of online experience: The learning strategies of Elaboration and the Critical Thinking. In order to determine where these significant results are located, a post hoc examination among the three pairwise mean comparisons were conducted using the Tukey’s test. The results for both significant learning strategies measures indicated mean differences between those students with less and moderate experience against those with high experience in online learning. For the Elaboration learning strategy, there was a slight mean difference in the use of this strategy in Less Experienced compared with those with Moderate Experience levels against those Highly Experience online college students. This is not surprising since online learning is a new learning environment for these distance-learning participants. The usage of Elaboration learning strategy ameliorates as students self-regulate their own learning and acquire more experience after taking more than two online classes. Based on our findings, students self-regulate the acquisition of new knowledge by heavily relying on higher order

thinking. In this study, Highly Experienced students self-regulated their Critical Thinking as a better strategy to obtain more successful learning outcomes, which was also consistent with the literature (Pintrich et al, 1991; Tyler-Smith, 2006). In this case, online learners utilized previous knowledge to new situations in order to find solutions to complex real problems in real time (i.e., “When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.”). However, three DVs yielded no significant mean difference among different levels of online experience in Rehearsal, Organization, and Metacognition. Thus, these results indicated that online college students are constantly adjusting these learning strategies to self-regulate their own learning in online classes.

In the factorial design employed in this study, it was important to understand the main effects but also the interacting effects that these grouping variables may have among each other, there are three first-order interaction effects (i.e., Gender by Generational level, Gender by Online Learning Experience levels, and Generational level by Online Learning Experience levels) and only one second-order interaction effect among all these variables. The next section presents the findings obtained on these interactions.

## **INTERACTIONS**

The fourth research question was designed to investigate whether there were significant differences in the first-order interaction gender by generational levels and the use of learning strategies. For this interaction, there were no statistically significant mean differences in the 3 first-order interactions, Gender, Generation level, and the five DVs. Thus, these findings indicate that online learners are self-regulating across the different learning strategies: Rehearsal, Elaboration, Organization, Critical, and Metacognition as they acquire new knowledge. These

findings indicated that gender and generational levels were not a determining factor for the use or lack of use of these learning strategies under an online learning environment.

The fifth research question was intended to inquire whether there were significant differences between Gender and Level of Online Experience and the use of learning strategies. There were no statistically significant mean differences in the first-order interactions Gender by Level of Online Experience and the five DVs, except a marginal significance with the use of critical thinking. It seems that the effect was only at the main effect level, however, inspection of some of the interactions between Gender, Generational level, and Level of Online Experience indicated slight mean difference at the cell level for Critical Thinking. This finding has been previously found by Arend (2007) regarding the need for higher order skills in college students:

In today's ever-changing global economy. Higher education is being asked to produce knowledge workers who can use resources to continually adapt and improve their knowledge and skills rather than memorize. (Arend, 2007, p. 13)

However, for this interaction effect, the online students in this study indicated that they used interchangeably and similarly each learning strategy as they self-regulated their own learning: Rehearsal, Elaboration, Organization, Critical Thinking (Marginally Significant), and Metacognition. Again, this is consistent with Zimmerman & Labuhn (2012) through their socio-cognitive research on self-regulation and the three separate self-regulation control forms as described below:

1. Covert Self-Regulation: The control exerted by the student on his or her emotions and motivation states.
2. Behavioral Self-Regulation: The control exerted by the student on his or her learning strategies (behaviors).

3. Environmental Self-Regulation: The control exerted by the student on his or her education environment (i.e. online learning) (p. 138).

According to Zimmerman (2002) and modified by the researcher to fit online learning-Three key forms of self-regulation are shown in Figure 11:

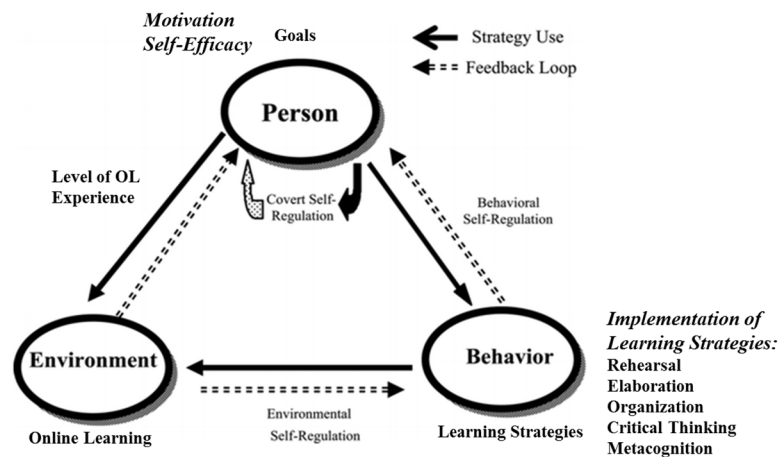


Figure 11. Modified to fit online learning-Three key forms of self-regulation. From “A Social Cognitive View of Self-Regulated Learning” Zimmerman, 1989, 81, p.330.

The way these three forms of control are regulated are best illustrated as follows: The online learners regardless of Gender, Generational Level, or Level of Online Experience better achieve personal goals by self-regulating their behavior to meet the demands of online classes. The online student is in constant regulation of the environment by adapting and adjusting to new situations during the online class; moreover, the learner modulates his or her motivation and self-efficacy utilizing the learning strategy for online settings.

The sixth research question was constructed to determine if the students’ Generational levels crossed with their Online Learning Experience levels and their use of learning strategies. There were no statistically significant mean differences observed for this interaction effect across any of the five DVs. These findings are consistent with our previous results because online students report a consistent interchangeable use of these learning strategies: Rehearsal,

Elaboration, Organization, Critical, Metacognition (Marginal Significant) as they self-regulate their own learning. It seems that the effect was only at the main effect level, however, inspection of some of the interactions between Gender, Generational Level, and Level of Online Experience indicated slight mean difference at the cell level for Metacognition as First Generation students tend to use slightly more Metacognition when they have Somewhat Experience (3-5 classes) compared to the Less Experienced and Highly Experienced than the Continuous Generation students.

Upon examination of this interaction effect, the Gender, Generational Level, and Level of Online Experience interaction showed no statistically significant mean differences across the five learning strategy variables. These findings are important because examination of these three distinct factors seems to indicate that online students are using or adjusting all the learning strategies in a very similar fashion as they self-regulate their own learning and social presence. For online classes students should apply social presence to self-regulate their own learning in online classes. Furthermore, social presence in online learning creates unique interactions between faculty, students, and knowledge (Jézégou, 2012). Furthermore, these observed findings are consistent with the three key forms of self-regulation (Zimmerman, 1989, p. 330) modified for online learning. As the online learning student interacts with the online learning environment (E) the level of experience from novice to experience will determine how well the student would be able to navigate and succeed in online learning classes. Importantly, a critical characteristic of these three forms of the self-regulation model is its cyclical dependence on the continuous feedback for the personal, behavioral, and environmental components to develop strategic adaptations as the student is generating its own use of learning strategies. For example, as a novice student in online learning, it could be difficult to navigate within the learning



management system (LMS) and establish a social presence within an environment that requires 100% self-discipline and self-direction. The student must adapt his/her behavior to understand the specific content for the class through the use of learning strategies for online learning. Nonetheless, because there is continuous feedback and there is interdependence between the three control forms, the student through the process of self-regulation should be able to modify or adjust his or her goals, learning strategies, and online learning experiences to facilitate the learning experience by eliciting strategic adaptations, resulting in academic success. Zimmerman (2002) stated that, “Self-regulated learning is not a mental ability or an academic performance skill; it is a self-directed process by which learners transform their mental abilities into academic skills” (p. 65). Moreover, Self-regulation is consistent with Bandura’s triadic socio-cognitive theory and the interaction of the personal, behavioral, and environmental components work as part of the reciprocal causality system (Bandura, 1986).

All in all, these learning strategies’ differences only contributed to no more than 4 percent of the variance accounted for which it seems to indicate that regardless of gender, generational level, and level of online experience, students are making, for the most part, similar use of these strategies, which indicates that there is a need to examine other important educational and instructional strategies in online learning.

#### **DISCUSSION OF SUPPLEMENTARY FINDINGS**

Table 13 is a summary of the most prevalent learning strategies, out of the 31 items, those five have indicated the highest mean differences. The most used learning strategy was Metacognitive Self-regulation (i.e., “When I become confused about something I’m reading for this class, I go back and try to figure it out.”). This is followed by Organization (i.e., “When I study for this online course, I go through the readings and my online notes and try to find the

most important ideas.”). The next is Elaboration (i.e., “When reading for this online class, I try to relate the material to what I already know.”). This is followed by Rehearsal (i.e., “When studying for this online course I try to determine which concepts I don’t understand well.”). The last most prevalent is Critical Thinking (i.e., “I try to play around with ideas of my own related to what I am learning in this online course.”). These results are very consistent with the most prevalent mean differences with Pintrich’s (1990) study. This is important because his study validates the MSLQ scale with a population predominantly Hispanic and low socioeconomic status even though his original sample population were white and middle class (Pintrich, 1990). Furthermore, this study is important because it is the first research conducted to measure the learning strategies used in online learnings in a HSI. Also, this Hispanic Serving Institution is located in the world's largest bi-national metropolitan area, totaling 2.5 million residents. This HSI serves its region by providing access, excellence, and high-quality education where more than 80% of its graduates stay in the vicinity after graduation.

Table 13

Most Used Learning Strategies Itemized Mean Differences.

<u>Item</u>	<u>Mean</u>	<u>Std. Deviation</u>
28 (Rehearsal)	5.23	1.28
22 (Elaboration)	5.79	1.11
7 (Organization)	5.83	1.12
23 (Critical Thinking)	5.19	1.32
<b>6<sup>1</sup> (Metacognition)</b>	<b>6.03</b>	<b>1.12</b>

(N=582); <sup>1</sup>Most prevalent used learning strategy; 1= not at all true of me to 7=very true of me.

## SUMMARY OF STUDY

The study was designed to examine student utilization and application of learning strategies in college level online courses. The context was a Hispanic Serving Institution (HSI) in

the Southwest. Online courses continue to grow at a steady pace, however, few research studies have analyzed the utilization of learning strategies and their utility in online learning programs and under the fold of student success considering factors such as Gender, Generational Level of students, and student levels of prior experiences with online learning (Ishitani, 2006; Yukselturk and Bulut, 2009). Therefore, the overarching purpose of the present study was to delve into these factors across important learning strategies under this instructional format. Previous studies have indicated that the transition to online learning courses demand autonomy, self-discipline, and self-regulation. Due to the fast pace and independent learning environments, students are more prone to struggle in distance education than they may in face-to-face educational settings (Thomas & Gadbois, 2007; Harrell, 2008; Andrade & Bunker, 2009; Artino, 2009).

The study was designed to draw from previous research that utilized the Motivated Strategies for Learning Questionnaire (MSLQ) validated and modified for online learning by Arend (2007) but originally developed by Pintrich for face-to-face (1990). Furthermore, those studies indicated that online education is transforming from basic rehearsal strategies to more complex learning strategies. University graduates should be able to apply metacognitive strategies to access and utilize available information and resources in the workplace to find new solution to complicated world problems. This in turn, requires higher education to produce knowledge workers who can optimize resources to sharpen their skills rather than regurgitate mere facts (Arend, 2007).

For the present study a causal-comparative study was used. Five dependent variables were examined to determine main and interaction effects between gender, college student's generational level, level of online learning experience across the five MSLQ learning strategies (Rehearsal, Elaboration, Organization, Critical Thinking, Metacognitive Self-Regulation)

employed by college students in online learning as controlled by the student's self-reported GPAs.

## **LIMITATIONS**

This research attempted to illustrate the use and application of learning strategies by college students in an online learning environment. There are several noteworthy limitations of the study that need to be acknowledged and discussed. The first limitation deals with the exclusive use of only one institution, a Hispanic Serving Institution and the participants were only enrolled in an online program for the spring semester 2018. Student selection for the study was done at the end of the spring 2018; this means that participants had passed the withdraw deadline for the semester for the online class; thus, the students who completed the survey had the persistence to complete the distance education course. A second limitation regarding the student sample deals with the limiting factor of no randomization on the selection of the sample which could lead to issues of generalization of findings. However, the generalizability of these results may be limited to only similar college student populations that employ similar learning management systems and technologies. Thus, our results are only transferable to comparable institutions of higher education. A third limitation includes the potential for survey completion fatigue. The instrument consisted of 68 scale and demographic items. However, the reported average time that students took to complete the survey was about 15 minutes, which seemed to be a reasonable time due to the high participation rate. A fourth limitation to consider is the nature of the individual item self-reporting of students' perceptions of own use of these five types of learning strategies. Self-report measures are not as accurate and may not completely report student behaviors (Boakearts & Cascallar, 2006). The fifth limitation to be of some level of concern is the aspect of students self-volunteering for the task. The sixth limitation is the lack

of homogeneity in online courses in relation to teaching and learning styles, teaching identities, teaching strategies, which in a large institution of higher education could be difficult to be observed. Finally, 64 participants did not complete the survey or answered the survey by entering either one or seven in the Likert scale producing results that behaved like outliers based on DeCarlo's (1997) macro on SPSS. Therefore, those students were considered non-respondent or missing. Although the final examined sample was of close to 600 students, this only represents about 10 percent of the total population of students enrolled in an online class during the semester the study was conducted. Even though this is a small percentage, the validity of our results may be supported partially due to the final sample size which easily exceeded the required minimum from the power analysis.

## **CONCLUSIONS**

Based on the study design and findings, there are implications for educational practice and future research. This section will first discuss research and practice implications, potential study modifications, and recommendations for future research.

## **IMPLICATIONS FOR RESEARCH AND PRACTICE**

The study findings suggest that the Motivated Strategies for Learning Questionnaire had relatively good reliability in terms of internal consistency. The reported moderate to high intercorrelations among the five learning strategies provides evidence that the measures are tapping into the general construct of self-regulation as an initial indicator of its construct validity. For external validity, the sample of students examined had a good representation of the different colleges and programs offered through online learning with a gradient of similarity. These findings suggest that universities need to provide and educate students to learn and apply best practices of self-regulation. The results of this study are supported by previous scholars such as

Pintrich (1999) and some other scholars who stated that, “The focus has been on the strategies individuals use to plan, monitor, and regulate their condition, not their metacognitive knowledge (Pintrich, Wolter, and Baxter, 2000, p.461). Also, Arend (2007) mentioned the importance of the use of the five learning strategies measured in this study. He indicated, “While online students are expected to use self-regulation strategies, they still likely need assistance transitioning the responsibility of learning to themselves” (Arend, 2007, p.13). The use of self-regulation strategies has a beneficial effect on academic performance as shown by previous studies (Hofer & Yu, 2003; DuBois & Stanley, 2007; Bail, Zhang, and Tachiyama, 2008).

Despite the observed findings on the present study, online learning and student success depends somewhat on the use of self-regulation learning strategies by students in an online learning environment. The present findings could be incorporated into faculty workshops where faculty members are particularly cognizant about the high percentage of First Generation and low socioeconomic students taking distance education classes. Also, the metacognitive self-regulation strategies (critical thinking and metacognition) should be emphasized during online course design. In addition, implementing networks of collaboration with academic, business, student affairs to improve online student services is highly recommended to enhance the student overall academic learning and success. Although the observed results indicated that both first and continuous generational level students reported similar used learning strategies, the institution needs to continue assisting them by developing an early alert system in collaboration with academic, student, and business affairs offices. For example, university advising centers can create ways of tracking first generation students’ progress in real-time by developing proactive interventions during the semester while the student is taking the course rather than waiting after the student has failed and is placed in probation or suspension. Another proactive intentional

intervention is the development of a student support app (SSA), where student affairs could provide not only a variety of career opportunities, but also, customizable updates in the product and services that the university provides for student socialization and engaging experiences. In addition, this same app could be used by academic affairs by merging it with the university's LMS to provide real-time progress reports and identify early interventions that could greatly help all the students, especially, the first-generation and low-socioeconomic student population.

A future study could be replicated and enhanced with the following recommendations: The study should be conducted with the participation of face-to-face and online learning students with a randomization design in the sample population of interest. It could be supported by the Vice President of Academic Affairs and the different college deans to be able to create institutional support where the findings could provide generalizations at a larger scale and create workshops for students, faculty, and administrators about the effective use of self-regulation. More self-regulation studies are needed to identify best practices in student learning strategies, especially with low socioeconomic and first-generation Hispanic students. Another important future study will be to compare academic performance and usage of particular learning strategy.

To conclude, online learning is changing the face of higher education. Nowadays this instructional mode of dissemination of knowledge is the new norm for colleges and universities. Distance education is accessible, flexible, and convenient and is indeed benefiting non-traditional students. In addition, with over six million students enrolled in at least one online class. It seems that before we know it, online learning will surpass face-to-face courses in higher education, therefore, it is imperative to better understand how online students use their learning and self-regulation strategies to acquire new knowledge and develop social presence as they navigate in the LMS (Blackboard) and interact with faculty, other students, and content. This is

significant because higher education administrators, faculty, and staff need to find better ways to serve the online learners. This study provided a valid perspective on the use of learning strategies for distance education students. In sum, based on the MSLQ instrument and demographic student sheets the following recommendations are suggested: better student services, academic and non-academic advising, virtual spaces, events, university activities, tutoring, student support extended-hours to promote holistic online learning student success.



## REFERENCES

- Allen, I. E., & Seaman, J. (2010). Class Differences: Online Education in the United States, 2010. *Sloan Consortium* (NJ1).
- Allen, I. E., & Seaman, J. (2013). Grade change: Tracking online education in the United States. Babson Park, MA: Babson Survey Research Group and Quahog Research Group.  
Retrieved from <http://www.onlinelearningsurvey.com/reports/gradechange.pdf>
- Allen, I. E., & Seaman, J. (2017). Digital learning compass: Distance education enrollment report 2017. *Online Learning Consortium, may*.
- Andrade, M. S., & Bunker, E. L. (2009). A model for self-regulated distance language learning. *Distance Education*, 30(1), 47-61.
- Angelino, L. M., Williams, F. K., & Natvig, D. (2007). Strategies to engage online students and reduce attrition rates. *Journal of Educators Online*, 4(2), n2.
- Arend, B. D. (2007). Course assessment practices and student learning strategies in online courses. *Journal of Asynchronous Learning Networks*, 11(4), 3-13.
- Artino Jr, A. R. (2010). Online or face-to-face learning? Exploring the personal factors that predict students' choice of instructional format. *The Internet and Higher Education*, 13(4), 272-276.
- Azevedo, R. (2005). Using hypermedia as a metacognitive tool for enhancing student learning? the role of self-regulated learning. *Educational Psychologist*, 40(4), 199-209.
- Bail, F. T., Zhang, S., & Tachiyama, G. T. (2008). Effects of a self-regulated learning course on the academic performance and graduation rate of college students in an academic support program. *Journal of college reading and learning*, 39(1), 54-73.

- Ball, W. J. (1995). Using the internet as a teaching tool: Why wait any longer? *PS: Political Science and Politics*, 28(4), 718-720.
- Barnard-Brak, L., Paton, V. O., & Lan, W. Y. (2010). Profiles in self-regulated learning in the online learning environment. *The International Review of Research in Open and Distributed Learning*, 11(1), 61-80.
- Bimber, B. (2000). Measuring the Gender Gap on the Internet. *Social Science Quarterly*, 81(3), 868-876. Retrieved from <http://www.jstor.org/stable/42864010>
- Boekaerts, M., & Cascallar, E. (2006). How far have we moved toward the integration of theory and practice in self-regulation? *Educational Psychology Review*, 18(3), 199-210.
- Box, G. E. (1953). Non-normality and tests on variances. *Biometrika*, 40(3/4), 318-335.
- Box, G. E. (1954). Some theorems on quadratic forms applied in the study of analysis of variance problems, I. Effect of inequality of variance in the one-way classification. *The annals of mathematical statistics*, 25(2), 290-302.
- Brown, H. E., & Burkhardt, R. L. (1999). *Predicting student success: The relative impact of ethnicity, income, and parental education* US Department of Education, Office of Educational Research and Improvement.
- Brown, M., Dehoney, J., & Millichap, N. (2015). The next generation digital learning environment. *A Report on Research. ELI Paper. Louisville, CO: Educause April.*
- Candy, P. C. (1991). *Self-Direction for Lifelong Learning. A Comprehensive Guide to Theory and Practice.* Jossey-Bass, 350 Sansome Street, San Francisco, CA 94104-1310.
- Cercone, K. (2008). Characteristics of adult learners with implications for online learning design. *Journal*, 16(2), 137-159.

- Cheurprakobkit, S., Hale, D. F., & Olson, J. N. (2002). Technicians' perceptions about Web-based courses: The University of Texas system experience. *The American Journal of Distance Education*, 16(4), 245-257.
- Chyung, S. Y. Y., & Trenas, A. S. (2009). Content Design for Performance-oriented Reusable Blended Learning. *The eLearning Guild's Learning Solutions eMagazine*, 1-9.
- Clinefelter, D. L., & Magda, A. J. (2013). *Online learning at private colleges and universities: A survey of chief academic officers*. Louisville, KY: The Learning House.
- Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary Education & Management*, 11(1), 19-36.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed method approaches* (3rd Ed.). Thousand Oaks, CA: Sage.
- Dabbagh, N., & Bannan-Ritland, B. (2005). *Online learning: Concepts, strategies, and application*. Upper Saddle River, NJ: Pearson Education, Inc.
- DeCarlo, L. T. (1997). On the meaning and use of kurtosis. *Psychological methods*, 2(3), 292.
- Engle, J., & Tinto, V. (2008). *Moving beyond access: College success for low-income. First-Generation Students*, Washington, DC: Pell Institute for the Study of Opportunity in Higher Education
- Edglossary. (n.d.) Retrieved from: <http://edglossary.org/>
- ElerningNC. Retrieved from: <http://elerningnc.org/>
- Fain, P. (2017). Federal Audit Challenges Faculty Role at WGU. *Inside Higher Ed*. Retrieved from <https://www.insidehighered.com/news/2017/09/22/education-depts-inspector-general-calls-western-governors-repay-713-million-federal>

- Ficklen, E., & Muscara, C. (2001). Harnessing technology in the classroom. *American Educator*, 5(3), 22-29.
- Geiger, 2014
- Flood, J. (2002). Read all about it: online learning facing 80% attrition rates. *Turkish Online Journal of Distance Education*, 3(2).
- Forbus, P., Newbold, J., & Mehta, S. (2011). First-generation university students: Motivation, academic success, and satisfaction with the university experience. *International Journal of Education Research*, 6(2), 34-55.
- Geiger, R. L. (2014). The history of American higher education: Learning and culture from the founding to World War II. Princeton University Press.
- Glesne, C. (2011). *Becoming qualitative researchers: An introduction* (4th Ed.). Boston, MA: Pearson Education, Inc.
- Globe Newswire (2017). Global E-Learning Market to Reach \$325 billion by 2025 - Rapid Growth in Online Content & Digitization / Innovations in Wearable Technologies are Flourishing the E-learning Industry. *Research and Markets*. Retrieved from <https://globenewswire.com/news-release/2017/02/06/914187/0/en/Global-E-Learning-Market-to-Reach-325-billion-by-2025-Rapid-Growth-in-Online-Content-Digitization-Innovations-in-Wearable-Technologies-are-Flourishing-the-E-learning-Industry.html>
- Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction*. Longman Publishing.
- Hahs-Vaughn, D. L. (2016). *Applied multivariate statistical concepts*. Taylor & Francis.
- Harrell, I. L. (2008). Increasing the Success of Online Students. *Inquiry*, 13(1), 36-44.
- Hernández-Ramos, P. (2005). If not here, where? Understanding teachers' use of technology in Silicon Valley schools. *Journal of Research on Technology in education*, 38(1), 39-64.

- Hofer, B. K., & Yu, S. L. (2003). Teaching self-regulated learning through a "Learning to Learn" course. *Teaching of Psychology*, 30(1), 30-33.
- Hogan, R. (2012). *Transnational distance learning and building new markets for universities* IGI Global.
- Houle, C. O. (1996). *The Design of Education*. Jossey-Bass Higher and Adult Education Series. Jossey-Bass Inc., Publishers, 350 Sansome Street, San Francisco, CA 94104.
- Hoxby, C. M. (2014). The economics of online postsecondary education: MOOCs, nonselective education, and highly selective education (No. w19816). National Bureau of Economic Research.
- Huberty, C. J., & Petoskey, M. D. (2000). Multivariate analysis of variance and covariance. In *Handbook of applied multivariate statistics and mathematical modeling* (pp. 183-208).
- Hu, H., & Gramling, J. (2009). Learning strategies for success in a web-based course: A descriptive exploration. *Quarterly Review of Distance Education*, 10(2), 123.
- Ishitani, T. T. (2006). Studying attrition and degree completion behavior among first-generation college students in the United States. *The Journal of Higher Education*, 77(5), 861-885.
- Jézégou, A. (2010). Community of inquiry in e-learning: A critical analysis of the Garrison and Anderson model. *Journal of Distance Education (Online)*, 24(3), 1.
- Jézégou, A. (2012). Towards a Distance Learning Environment that Supports Learner's Self-Direction. The Model of Presence. *International Journal of Self-Directed Learning*, 9(1), 11-23.
- Khan, B. (1997). Web-based instruction (WBI): What is it and why is it? In B.H. Khan (Ed.), *Web-based instruction* (pp. 41-46). Englewood Cliffs, NJ: Educational Technology Publications, Inc.

- Killion, J. (2000). Log on to learn. *Journal of Staff Development*, 21(3), 48-53.
- Kiser, K. (1999). 10 things we know so far about online training. *Training*, 36, 66–74.
- Laaser, W. (2011). Economics of distance and online learning: Theory, practice and research. *International Review of Research in Open and Distance Learning*, 12(2), 138-142.
- Lei, S. & Gupta, R. (2010). College distance education courses: Evaluating benefits and costs from institutional, faculty, and students' perspectives. *Education*, 130(4), 616-631.
- Levy, S. (2003). Six factors to consider when planning online distance learning programs in higher education. *Online Journal of Distance Learning Administration*, VI (I), Spring 2003. Retrieved from <http://www.westga.edu/~distance/ojdla/spring61/levy61.htm>.
- Lightweis, S. (2014). The challenges, persistence, and success of white, working-class, first-generation college students. *College Student Journal*, 48(3), 461-467.
- Liu, W. C., Wang, C. K. J., Koh, C., Chye, S., Chua, B. L., & Lim, B. S. C. (2012). Revised motivated strategies for learning questionnaire for secondary school students. *International Journal*, 8.
- Lombardi, M. M. (2008). Making the grade: The role of assessment in authentic learning. *EDUCAUSE Learning Initiative*.
- Lumsden, K. G., & Ritchie, C. (1974). The Open University: A survey and economic analysis. *ETS Research Report Series*, 1974(1)
- Methvin, J. (2012). *Perceptions of the College Experience Held by Life Partners of Rural, Nontraditionally-Aged, First-Generation Community College Students*, (Doctoral dissertation, Walden University).
- Montgomery, K. C. (2009). Generation digital: Politics, commerce, and childhood in the age of the internet. Cambridge, MA: MIT Press

- Moore, M. G., & Kearsley, G. (2005). Distance education: A systems view (2nd Ed.). Belmont, CA: Wadsworth Publishing Co.
- Moore, M. G., & Kearsley, G. (2011). Distance education: A systems view of online learning Cengage Learning.
- Moschovitis, C. J., Poole, H., & Senft, T. M. (1999). History of the Internet: A Chronology, 1843 to the Present. AB C-CLIO, Incorporated.
- National Center for Educational Statistics. (2014). Distance education at degree-granting postsecondary institutions: 2002-2012. Retrieved from <http://nces.ed.gov/surveys/peqis/publications>.
- Nichols, M. (2010). Student perceptions of support services and the influence of targeted interventions on retention in distance education. *Distance Education*, 31(1), 93-113.
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in health sciences education*, 15(5), 625-632.
- Knowles, M. S. (1968). Andragogy, not pedagogy. *Adult leadership*, 16(10), 350-352.
- Kruskal, W. H., & Wallis, W. A. (1952). Use of ranks in one-criterion variance analysis. *Journal of the American statistical Association*, 47(260), 583-621.
- Nunez, A. (1998). *First-generation students: Undergraduates whose parents never enrolled in postsecondary education* Diane Publishing.
- Olejnik, S. F., & Algina, J. (1984). Parametric ANCOVA and the rank transform ANCOVA when the data are conditionally non-normal and heteroscedastic. *Journal of Educational Statistics*, 9(2), 129-149.
- Olgren, C.H. (1998). Improving learning outcomes: The effects of learning strategies and motivation. In C.C. Gibson (Ed.), *Distance learners in higher education* (pp. 77-96).

- Madison, WI: Atwood Publishing.
- Osciak, S. Y., & Milheim, W. D. (2001). Multiple intelligences and the design of Web-based instruction. *International Journal of Instructional Media*, 28(4), 355.
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of educational psychology*, 82(1), 33.
- Pintrich, P.R., Smith, D.A.F., Garcia, T., & McKeachie, W.J. (1991). A manual for the use of the motivated strategies for learning questionnaire (MSLQ). Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and learning.
- Pintrich, P. R., Smith, D. A., Garcia, T., & McKeachie, W. J. (1993). Reliability and predictive validity of the motivated strategies for learning questionnaire (MSLQ). *Educational and Psychological Measurement*, 53(3), 801-813.
- Pintrich, P. R., Wolters, C. A., & Baxter, G. P. (2000). 2. Assessing Metacognition and Self-Regulated Learning.
- Richardson, R. C., & Skinner, E. F. (1992). Helping first-generation minority students achieve degrees. *New Directions for Community Colleges*, 1992(80), 29-43.
- Redmond, P. (2011). From face-to-face teaching to online teaching: Pedagogical transitions. In *Proceedings ASCILITE 2011: 28th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education: Changing Demands, Changing Directions* (pp. 1050-1060). Australasian Society for Computers in Learning in Tertiary Education (ASCILITE).
- Reynard, R. (2017). Technology and the Future of Online Learning. *Campus Technology*. Retrieved from <https://campustechnology.com/articles/2017/03/01/technology-and-the-future-of-online-learning.aspx>



- Rogers, C. R. (1969). *Freedom to learn: A view of what education might become* (Vol. 69). Columbus, OH: Merrill.
- Rotgans, J. I., & Schmidt, H. G. (2010). The Motivated Strategies for Learning Questionnaire: A Measure for Students' General Motivational Beliefs and Learning Strategies? *Asia Pacific Education Researcher (De La Salle University Manila)*, 19(2).
- Schools, M. C. P. (2011). Annual Report on Our Call to Action.
- Schumaker, J. B., & Deshler, D. D. (1992). Validation of learning strategy interventions for students with learning disabilities: Results of a programmatic research effort. In *Contemporary intervention research in learning disabilities* (pp. 22-46). Springer, New York, NY.
- Smith, A. A. (2017). Standardization in Online Education. *Inside Higher Ed*. Retrieved from <https://www.insidehighered.com/news/2017/09/15/accreditor-denies-arizona-community-colleges-bid-expand-online>
- Soria, K. M., & Stebleton, M. J. (2012). First-generation students' academic engagement and retention. *Teaching in Higher Education*, 17(6), 673-685.
- Small, N. J. H. (1980). Marginal skewness and kurtosis in testing multivariate normality. *Applied Statistics*, 85-87.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Allyn & Bacon/Pearson Education.
- Thayer, P. B. (2000). Retention of students from first generation and low income backgrounds. *ERIC*.

- Thomas, C. R., & Gadbois, S. A. (2007). Academic self-handicapping: The role of self-concept clarity and students' learning strategies. *British Journal of Educational Psychology*, 77(1), 101-119.
- Tyler-Smith, K. (2006). Early attrition among first time eLearners: A review of factors that contribute to drop-out, withdrawal and non-completion rates of adult learners undertaking eLearning programmes. *Journal of Online Learning and Teaching*, 2(2), 73-85.
- Wang, Y. (2004). Assessment of learner satisfaction with asynchronous electronic learning systems. *Information and Management*, 41(1), 75-86.
- Yukselturk, E., & Bulut, S. (2009). Gender differences in self-regulated online learning environment. *Journal of Educational Technology & Society*, 12(3), 12.
- Zafft, C. K. (2008). Bridging the great divide: Approaches that help adults navigate from adult education to college. *Adult Learning*, 19(1-2), 6-11.
- Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, 23(4), 614-628.
- Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of educational psychology*, 81(3), 329.
- Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achievement: An overview and analysis. In B. J. Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achievement: Theoretical perspectives (p. 1-37). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70.

Zimmerman, B. J., & Labuhn, A. S. (2012). Self-regulation of learning: Process approaches to personal development.

## APPENDIX A: MSLQ

### Motivated Strategies for Learning Questionnaire\*

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

1. When I study the readings for this course, I outline the material to help me organize my thoughts.
2. During my online class time I often miss important points because I'm thinking of other things.
3. When reading for this course, I make up questions to help focus my reading.
4. I often find myself questioning things I hear or read in this course to decide if I find them convincing.
5. When I study for this online class, I practice saying the material to myself over and over.
6. When I become confused about something I'm reading for this class, I go back and try to figure it out.
7. When I study for this online course, I go through the readings and my online notes and try to find the most important ideas.
8. If course readings are difficult to understand, I change the way I read the material.
9. When studying for this course, I read my online notes and the course readings over and over again.
10. When a theory, interpretation, or conclusion is discussed in an online discussion or in the readings, I try to decide if there is good supporting evidence.
11. I make simple charts, diagrams, or tables to help me organize the online course material.
12. I treat the online course material as a starting point and try to develop my own ideas about it.
13. When I study for this online class, I pull together information from different sources, such as lectures, readings, and discussions.
14. Before I study new online course material thoroughly, I often skim it to see how it is organized.
15. I ask myself questions to make sure I understand the material I have been studying in this online class.
16. I try to change the way I study in order to fit the course requirements and the online instructor's teaching style.
17. I often find that I have been reading for this online class but don't know what it was all about.
18. I memorize key words to remind me of important concepts in this online class.
19. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this online course.
20. I try to relate ideas in this online subject to those in other courses whenever possible.
21. When I study for this online course, I go over my online notes and make an outline of important concepts.
22. When reading for this online class, I try to relate the material to what I already know.
23. I try to play around with ideas of my own related to what I am learning in this online course.
24. When I study for this online course, I write brief summaries of the main ideas from the readings and my online notes.

25. I try to understand the material in this online class by making connections between readings and the concepts from the online lectures.
26. Whenever I read or hear an assertion or conclusion in this online class, I think about possible alternatives.
27. I make lists of important items for this course and memorize the lists.
28. When studying for this online course I try to determine which concepts I don't understand well.
29. When I study for this online class, I set goals for myself in order to direct my activities in each study period.
30. If I get confused taking notes in this online class, I make sure I sort it out afterwards.
31. I try to apply ideas from course readings in other online activities such as discussion boards, chat-rooms, live collaborative sessions (i.e. Blackboard Collaborate).

\*Pintrich, R. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance, *Journal of Educational Psychology*, 82, 33-40.

## **APPENDIX B: DEMOGRAPHIC INFORMATION**

### **SHEET FOR STUDENT SURVEY PARTICIPATION**

Please provide the following demographic information about yourself. This information will only be used to assist me in developing a profile of the study's participants.

1. What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other, please explain: \_\_\_\_\_

2. What is your current GPA? \_\_\_\_\_

3. Are you a first generation student attending college?

- ☐ Yes
- ☐ No

If, no

- ☐ Father-only
- ☐ Mother-only
- ☐ Siblings

4. Identify the degree you are pursuing:

- ☐ Bachelor's
- ☐ Master's
- ☐ Doctorate

Other, please explain:

---

5. Please identify the college that you are a student in

- ☐ College of Business Administration
- ☐ College of Education
- ☐ College of Engineering
- ☐ College of Health Science
- ☐ College of Liberal Arts
- ☐ College of School of Nursing
- ☐ College of School of Science
- ☐ Double major, please explain: \_\_\_\_\_

6. What is your major(s) (i.e. Chemistry)

---

7. How many credit hours are you taking this semester?

- ☐ 1-3 hours
- ☐ 4-6 hours
- ☐ 7-9 hours

- ☐ 10-12 hours
- ☐ 13+

8. Are you currently employed?

- ☐ Yes  
☐ No. Skip to Question 8.

9. Is your employment

- ☐ On campus  
☐ Off campus

10. Approximately, how many hours per week do you work?

\_\_\_\_\_

11. Identify your race or ethnicity.

- ☐ White/Caucasian
- ☐ Black/African American
- ☐ Asian American/Pacific Islander
- ☐ Hispanic/Latino(a)
- ☐ Native American or American Indian
- ☐ Other, please explain: \_\_\_\_\_

12. Are you military affiliated?

- ☐ No
- ☐ Active
- ☐ Veteran
- ☐ Reserve
- ☐ Spouse
- ☐ Other, please explain: \_\_\_\_\_

13. How do you fund your education? (Check all that apply)

- ☐ Financial Aid
- ☐ Grants/Scholarships
- ☐ Loans
- ☐ Third party (i.e. Employer)
- ☐ Out-of-pocket
- ☐ Other, please explain: \_\_\_\_\_

14. What is your personal income?

- ☐ 0-\$15,000
- ☐ \$15,001-\$30,000
- ☐ \$30,001-\$45,000
- ☐ \$45,001-\$60,000
- ☐ \$60,001-\$75,000
- ☐ \$75,001-\$100,000
- ☐ Over \$100,000

15. What is your household income?
- ☐ 0-\$15,000
  - ☐ \$15,001-\$30,000
  - ☐ \$30,001-\$45,000
  - ☐ \$45,001-\$60,000
  - ☐ \$60,001-\$75,000
  - ☐ \$75,001-\$100,000
  - ☐ Over \$100,000
16. At the present time I am \_\_\_\_ years old.
17. How many online courses have you taken in the past 4 years? \_\_\_\_\_
18. How many online courses are you currently taking? \_\_\_\_\_
19. Please list the online course(s) that you have enrolled in \_\_\_\_\_
20. How likely will you enroll in online courses in the future?
- ☐ Very likely
  - ☐ Likely
  - ☐ Not likely
  - ☐ Not very likely
  - ☐ Why or why not \_\_\_\_\_
21. Are you in a fully online degree program? \_\_\_\_\_
- ☐ Yes
  - ☐ No, specify \_\_\_\_\_
22. What is your first language?
- ☐ English
  - ☐ Spanish
  - ☐ Other, specify \_\_\_\_\_
23. How could the university better support your success as an online learner?
24. What are your familial responsibilities? (i.e., caretaking, children, etc.)
25. What learning activities increase your engagement in an online class? Why?
26. How accessible are the online learning resources offered by the university? Why?
27. How can online courses help you feel like you are a part of the UTEP learning community?
28. What are some factors that motivate you to take online classes?
29. Do you commute to UTEP?
- ☐ No
  - ☐ Yes, from where do you commute?
  - ☐ El Paso



- ☐ New Mexico
- ☐ Juarez, Mexico
- ☐ Other, specify \_\_\_\_\_

30. For your online class what devices do you use? (Check all that apply)

- ☐ Smart Phone
- ☐ Tablet
- ☐ If tablet:
- ☐ Android
- ☐ Apple
- ☐ Laptop
- ☐ Desktop
- ☐ Other, specify \_\_\_\_\_

## **APPENDIX C: COVER LETTER FOR MSLQ SURVEY**

Dear Student:

My name is Ricardo Acevedo and I am a doctoral student in the Educational Leadership and Foundations Department. The purpose of my research is to understand your learning strategies in online courses.

As part of my study, I would like to ask you to complete the Motivated Strategies for Learning Questionnaire (MSLQ). Your participation in this questionnaire is completely voluntary and refusing to participate will not lead to any penalties or withdrawal of services. No specific association will be made to individuals and findings will only, be reported as an aggregate. Only I will receive the data which is password protected and store in a secure place, with a password protected and encrypted computer. You will not be compensated for taking part in this research study.

If you have any questions regarding the procedures of this study, you can contact me via telephone at (915) 740-0555 or email at [racevedo@utep.edu](mailto:racevedo@utep.edu). In compliance with UTEP's Institutional Review Board (IRB) protocol, any information you provide will be kept confidential. Any questions regarding the conduct of this research of your rights as a research participant may be directed to the IRB Administrator at (915) 747-7939.

By completing the survey, you are indicating that you understand the above and that you give consent to participate in the study. Please click on the link below to complete the survey.  
Thank you for your participation in completing this survey.

Sincerely,

Ricardo Acevedo  
Doctoral Student  
Educational Leadership and Foundation Department  
The University of Texas at El Paso  
[www.qualtrics.utep.edu/onlinelearningstrategies](http://www.qualtrics.utep.edu/onlinelearningstrategies)

## APPENDIX D: IRB EXEMPT APPROVAL



**THE UNIVERSITY OF TEXAS AT EL PASO**  
Office of the Vice President for Research and Sponsored Projects  
**Institutional Review Board**  
El Paso, Texas 79968-0587  
phone: 915 747-8841 fax: 915 747-5931

**FWA No: 00001224**

DATE: April 9, 2018

TO: Ricardo Acevedo, MBA/M.S.

FROM: University of Texas at El Paso IRB

STUDY TITLE: [1036107-1] An Examination of Student Self-Regulation Learning Strategies in Online Learning at a Hispanic Serving Institution

IRB REFERENCE #: College of Education

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: April 9, 2018

REVIEW CATEGORY: 45 CFR 46.101(b)(2)

Thank you for your submission of New Project materials for this research study. University of Texas at El Paso IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

Exempt protocols do not need to be renewed. Please note that it is the Principal Investigator's responsibility to resubmit the proposal for review if there are any modifications made to the originally submitted proposal. This review is required in order to determine if "Exemption" status remains.

We will put a copy of this correspondence on file in our office.

If you have any questions, please contact the IRB Office at (915) 747-8841 or [irb.orsp@utep.edu](mailto:irb.orsp@utep.edu). Please include your study title and reference number in all correspondence with this office.

cc:

## APPENDIX E: ITEMIZED MSLQ MEAN DIFFERENCES

Table 8.

Percentages and means of student responses to the individual MSLQ items

Item #	Statement	1	2	3	4	5	6	7	Mean
1	When I study the readings for this course, I outline the material to help me organize my thoughts.	9	5	6	10	33	17	20	4.85
2	During my online class time I often miss important points because I'm thinking of other things.	28	20	13	16	15	4	4	2.95
3	When reading for this course, I make up questions to help focus my reading.	21	10	13	24	20	9	4	3.52
4	I often find myself questioning things I hear or read in this course to decide if I find them convincing.	12	9	8	24	24	14	9	4.19
5	When I study for this online class, I practice saying the material to myself over and over.	13	6	8	19	24	15	14	4.39
6	When I become confused about something I'm reading for this class, I go back and try to figure it out.	1	1	2	4	22	26	44	6.03
7	When I study for this online course, I go through the readings and my online notes and try to find the most important ideas.	0	1	3	7	25	28	36	5.83
8	If course readings are difficult to understand, I change the way I read the material.	5	3	6	23	29	17	17	4.87
9	When studying for this course, I read my online notes and the course readings over and over again.	3	3	8	13	34	19	19	5.07
10	When a theory, interpretation, or conclusion is discussed in an online discussion or in the readings, I try to decide if there is good supporting evidence.	2	2	4	18	33	23	18	5.19
11	I make simple charts, diagrams, or tables to help me organize the online course material.	23	9	11	20	19	12	7	3.66
12	I treat the online course material as a starting point and try to develop my own ideas about it.	4	5	8	24	33	16	12	4.69
13	When I study for this online class, I pull together information from different sources, such as lectures, readings, and discussions.	2	1	3	11	29	24	30	5.59
14	Before I study new online course material thoroughly, I often skim it to see how it is organized.	4	2	4	10	27	24	30	5.44
15	I ask myself questions to make sure I understand the material I have been studying in this online class.	6	4	8	18	33	18	15	4.81
16	I try to change the way I study in order to fit the course requirements and the online instructor's teaching style.	4	3	3	14	31	22	22	5.22
17	I often find that I have been reading for this online class but don't know what it was all about.	24	16	13	19	16	7	5	3.29
18	I memorize key words to remind me of important concepts in this online class.	3	3	5	12	35	22	20	5.19
19	I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this online course.	4	4	7	21	32	19	14	4.83
20	I try to relate ideas in this online subject to those in other courses whenever possible.	2	2	3	17	34	20	23	5.31
21	When I study for this online course, I go over my online notes and make an outline of important concepts.	8	6	8	18	29	16	16	4.61
22	When reading for this online class, I try to relate the material to what I already know.	0	1	2	8	29	26	34	5.79
23	I try to play around with ideas of my own related to what I am learning in this online course.	1	3	5	19	34	19	20	5.17
24	When I study for this online course, I write brief summaries of the main ideas from the readings and my online notes.	13	10	10	20	25	12	10	4.08
25	I try to understand the material in this online class by making connections between readings and the concepts from the online lectures.	1	2	4	13	34	24	23	5.41
26	Whenever I read or hear an assertion or conclusion in this online class, I think about possible alternatives.	4	4	7	27	31	17	11	4.69
27	I make lists of important items for this course and memorize the lists.	12	6	9	23	26	15	9	4.26
28	When studying for this online course I try to determine which concepts I don't understand well.	2	2	4	13	38	25	16	5.23
29	When I study for this online class, I set goals for myself in order to direct my activities in each study period.	4	2	5	13	31	21	25	5.25
30	If I get confused taking notes in this online class, I make sure I sort it out afterwards.	7	4	6	22	30	18	13	4.68
31	I try to apply ideas from course readings in other online activities such as discussion boards, chat-rooms, live collaborative sessions (i.e. Blackboard Collaborate).	5	3	4	18	24	22	25	5.17

N = 582, 1= not at all true of me to 7=very true of me (2,17 Reverse scale)

## **VITA**

### **Educational Administration and Leadership**

Ricardo Acevedo earned his Bachelor of Science in Chemistry at The University of Texas at El Paso (UTEP) in 2001. In 2004, he received his Master of Science degree in Biological Sciences from UTEP. After 7 years of teaching K-12, he returned to UTEP for his second Master in Business Administration completed by 2013. Finally, because of his background in STEM, business and Education Administration he joined UTEP's doctoral program in Educational Administration and Leadership in 2013.

Dr. Acevedo's dissertation research was the first of its kind in the U.S. and measured the learning strategies that college students are utilizing in online learning courses at UTEP. He was granted access by the Dean of Extended Universities, Dr. Beth Brunk-Chavez to study all the online students at UTEP in more than 400+ online courses and about 6,000 students.

While pursuing his doctoral degree, Dr. Acevedo worked as an Instructional Designer in Academic Technologies at UTEP, then he became an Academic Advisor/Faculty at the College of Science. He left UTEP to become a Director HSI-STEM at Schreiner University, He was in charge for the administration and program management of day to day operations of the HSI-STEM multi-million dollar capacity building grant by Department of Education, Liaison between Schreiner University and the Department of Education, budgeting, and advising students on STEM majors and career pathways. Responsible for first-year: summer bridge program, STEM living and learning community (first year and transfer students), transfer articulation agreements, undergraduate research, faculty development, student success coaches, STEM center for quantitative literacy and student success, and new construction of a center for quantitative literacy.

Dr. Acevedo's dissertation, "AN EXAMINATION OF STUDENT SELF-REGULATION LEARNING STRATEGIES IN ONLINE COURSES AT A HISPANIC SERVING INSTITUTION," was supervised by Dr. Arturo Olivarez Jr.