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Adaptive learning environments and student learning outcomes

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ADAPTIVE LEARNING ENVIRONMENTS AND STUDENT LEARNING OUTCOMES

by

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Abstract

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ADAPTIVE LEARNING ENVIRONMENTS AND THEIR IMPACT ON STUDENT LEARNING OUTCOMES
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In response to the urgent need to alleviate South Carolina from poverty and elevate them into the 21st century industry, South Carolina Department of Education (SCDE), has vowed to educate all South Carolina students and ensure that they "graduate prepared for success in college, careers, and citizenship (SCDOE, 2017). To accomplish this mission, SCDOE has developed rigorous educational standards, which include technology-integrated curricular (SCDOE, 2015). Through a non-experimental quantitative study, the relationship between adaptive learning environments (ALE) while employing technology and student outcomes were explored. These learning outcomes were in support of K-12 novice-mid language learners and were defined as an increase in students' post-assessment scores predetermined by their diagnostic assessment prior to formal instruction. The research took place at a public high school and the participants derived from two classes of French 3 language learners. This study seeks to discover the influence of ALE on student performance while focusing on 21st century industry standards.

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Chapter I

Introduction

In an effort to increase student engagement and achievement, and to prepare students to be college and career ready (National Governors Association & Council of Chief State School Officers, 2017, ELA standards introduction), public schools are employing technology as an integral part of their curriculum and instructional standards (Inan & Lowther, 2010). For example, some of the software applications employed in the classroom include Classcraft, Google, SnapChat, Facebook, and even Instagram (A. Clutts, personal communication, Oct. 23, 2017). These online platforms are redefining the classroom as "an Internet-based environment using computer-based technologies, and communication" (Terantino, 2009, p. 12).

Although their focus is higher education, Harper and Quaye (2015) postulate that student engagement, "is the participation in educationally effective practices both in and out of the class, which leads to a range of measurable outcomes" (p. 2). Reeve and Tseng (2011) described student engagement as "agentic", whereby students are agents of their education and seek out learning that best fits their needs. Lefkowitz (2015) complements this by positing that, "the skills needed to be successful in virtual education are in line with agentic engagement" (pg. 5). A critical component of student engagement is the availability of educational resources and institutional deployment and implementation of these resources (Harper & Quaye, 2015). One strategy for implementing these resources is through the application of online technology for delivering lessons in which students can be engaged while learning. Engagement through the effective use of online technology (Harper & Quaye, 2015) provides learners with varied learning methods and

practical experiences (Harper & Quaye, 2015). Ball (2011) posits, “Technology offers students the chance to "do" as they learn, using ‘hands’ and mind” (p. 13). Therefore, this study suggests that using Internet technology, as an adaptive means to differentiate students’ learning in the classroom should be effective at promoting student learning.

To address the challenges of student learning, public schools must restructure the traditional classroom instructional methodologies using a customized approach that addresses students’ needs (Devery, 2015) and appropriately assesses students’ learning outcomes (Briggs, Gagne, & Wager, 1992). The traditional classroom encompasses both the instruction and the environment. Wang and Lindvall (1984) posit “Insofar as learning is a function of the learner’s response to the environment, instruction is the intentional manipulation of the learning environment” (p. 161); giving rise to the terms Adaptive Learning Environment (ALE) also referred to as adaptive instruction (Wang & Lindvall, 1984). Consequently, the terms ALE and adaptive instruction are used interchangeably throughout this study. Moreover, implementing an ALE while using technology as a concept of differentiated instruction is a strategy for students to achieve success (Schuh, Jones, & Harper, 2011). In this study, the idea of an ALE is a conceptual framework that will encompass three main components: assessment, differentiated instruction, and technology.

Adaptive learning environments are not to be confused with the teaching strategies of differentiated instruction. An ALE is an educational approach that incorporates alternative strategies for instruction. More importantly, it allows one to make the most of the resources available to achieve one’s objectives and also has the built-in flexibility to permit students to take various routes to, and amounts of time for,

learning (Wang & Lindvall, 1984). Differentiated instruction, however, is an approach to teaching that advocates effective teacher planning that respect student differences in the classrooms **(**Reeves, 2011; Tomlinson & Strickland, 2005).

Adaptive programs make use of a variety of practical techniques in classroom settings with a diverse group of students (Waxman, Wang, Anderson, & Walberg, 1985; Yang, Hwang, & Yang, 2013). These techniques include but are not limited to mastery learning, cooperative groups, individual tutorials, and varying group sizes for instructional approaches (Wang & Lindvall, 1984). As classroom diagnosticians, teachers are expected to identify students' learning needs, vary their use of materials and procedures, and are expected to treat students differently according to their individual educational needs (Wang & Lindvall, 1984). However, these strategies are not sufficient to meet students where they are in their development.

Implementing an ALE using online technology (Farnsworth & Bevis, 2006) that encourages students to meet the same rigorous standards as in traditional classrooms (Reeves, 2011), can facilitate instruction, while enabling the modification of activities not found in traditional classrooms. At a minimum, this environment should engender student outcomes similar to those of traditional classrooms. An ALE is an environment where teachers are allowed to design instructional activities that are self-directed and modifiable, by and based on, students' aptitudes to increase performance that will promote student-learning outcomes comparable to traditional classroom instruction (Yang et al., 2013; Tseng, et al., 2008). Because ALE gives teachers the flexibility to modify instruction in order to meet students where they are in their development, implementing an ALE in the classroom appears valid.

In order to design such adaptive instructional activities, teachers must be able to access, review, and modify assignments in a student technology portal. Such a portal requires that teachers have the necessary user rights to create and modify curriculum content and track students' performance (Rowe et al., 2013). Instructors can provide students with access to different applications within the programs to address specific areas of concern. For example, when teaching grammar, instructors may incorporate the application, Conjuguemos.com, to provide students with additional practice in conjugating verbs. Conjuguemos.com gives students various choices to focus on specific verb groups, sentence completion, idiomatic expressions, and discrimination drills. Teachers may also use the Flippity app, which allows students to create flashcards to review vocabulary. Beyond the user rights, the instructors must also add content to the adaptive program, once they have these rights. Adding a variety of content will create an ALE that will differentiate instruction to meet students' learning needs (Tomlinson & Strickland, 2005). It will be at the teacher's discretion, which assignments need to be modified, and which resources need to be assigned.

This study was designed in a real-world context that required "meeting students where they were" so that low-performing students were targeted with the appropriate form of instruction to get them back on track. High-performing students were challenged to continue and enrich their growth as well (SCDOE, 2015).

Student Learning Outcomes (SLO)

In 2015-2016, South Carolina educators began the SLO process, which requires districts to develop systems for tracking the assessments that teachers use and student growth starting at their baselines during various instructional intervals (SCDOE, 2015).

Moreover, they require teachers to set projections of student outcomes in the hopes of helping them make good predictions (SCDOE, 2015). This information is better used to inform appropriate and rigorous growth targets while setting the expectation that all students will grow and progress at least one grade level during the interval of instruction (SCDOE, 2015). As a result, students' language proficiencies are assessed utilizing a tiered growth target process (SCDOE, 2015).

Tiered growth targets. Growth targets are tiered to demonstrate growth for students who perform at various levels. Tiered growth targets include all students but at varying degrees of expected growth (SCDOE, 2015). In this study, to understand the influence of adaptive learning environments on student outcome, growth performance changes were analyzed following the completion of students' diagnostic assessment and instruction. Growth is defined as an increase in the difference between the pre and post-assessments (SCDOE, 2013). The outcomes of the diagnostic assessments are not to be confused with letter grades, although they are related. Therefore, this study extends the literature by looking at outcomes that go beyond letter grades (Johnson, 2010).

Standards. This study used World Readiness Standards for Learning Languages relevant to South Carolina educational stakeholders (SCDOE, 2013). This study only addressed language competency No. 1, Interpretive Listening (IL) and Reading (IR) whereby students "can interpret information, concepts, and ideas from a variety of culturally authentic sources on a variety of topics" (The National Standards Collaborative Board, 2015, p. 15). The remaining competencies were not addressed because the research site assessment protocols did not allow sufficient time to assess students on these competencies. Nor did these protocols allow sufficient time to grade the tests upon

completion in order to prepare and share the results with critical members of the school community as per district policy (SCDOE, 2013).

Scope. The research took place at a public high school, located in South Carolina, and the participants derived from multiple French language classes. Because this study involved a traditional high school with four marking periods worth of final grade assessments, the study was limited to approximately nine weeks of instruction.

Problem Statement

There were four main interests in studying the impact of adaptive learning environments. The first is the state of South Carolina's attempt to address its poverty and prepare students for 21st-century industries. The second is the experience of many language educators who struggle with maintaining students' active learning and collaboration while having to address the varying levels of comprehension and having to use learning practices with limited resources to effectively address students' individual needs (Bergmann & Sam, 2012). As a result, educators are finding more and more innovative approaches to address student learning such as the Flipped Classroom Model (Bergmann & Sam, 2012), Differentiated Instruction (Reeves, 2011; Tomlinson & Strickland, 2005), Tier Assessment (SCDOE, 2015), and Adaptive Learning (Yang et al., 2013). Third, because World language is compulsory to graduate high school, policy-makers require schools to demonstrate adequate yearly progress (SCDOE, 2013). Finally, current educators' viewpoints regarding the placement and performance of language learners fail to take into account several factors. First, most high school students are only required to take one year of a foreign language class to graduate high school limiting their potential fluency. Second, however, students must take two subsequent

courses in order for their language credits to be accepted by the colleges of their choice. Third, the current methodologies of instruction prolong the length of time required to acquire a language (Shea, 1998). Even after entering college, students can become discouraged with the process and cut their language studies short (Shea, 1998). These issues challenge 21st-century educational needs. Students need to able to address global intercultural competency as well as engage in global societies to better understand one another. This study focused on ALE addressed these challenges of insufficient intercultural exposure largely influenced by poverty.

The seventh annual report on national college completion rates (Shapiro et al., 2018) looks at a postsecondary educational student outcome. It looks at the various pathways students took toward degree completion as well as the completion rates for the different groups of students who followed each pathway (See Table 1).

Table 1

Enrollment in World Language Programs

Year	Enrollment
2012	21,756
2013	21,647
2014	20,332
2015	19,493

Gascoigne and Parnell (2014) have posited, “Foreign language persistence rates among both high school and college students have tended to go in one predictable and unpleasant direction: down” (p. 3). Therefore, unless world language classes provide for student engagement through the employment of educationally purposeful activities (Pruett & Absher, 2015) that sustain enrollment, students will lose interest in world language studies. Consequently, world language class offerings will continue to decline from lack of interest. Moreover, in light of a progressive movement towards a globalized society, such American students will only be further underprepared for the future global workforce (Cohen et al., 2014).

Offering multi-level, instructional, world language classes may sustain enrollment and prolong engagement. At first glance, it may seem impossible for students of varying levels to succeed in the same class. However, world language learning is one of the most flexible disciplines in which instructors can differentiate their pedagogy and assessments to meet their students’ language acquisition needs (DeAngelo, 2011; Niculescu & Obilisteanu, 2016; Tomlinson & Strickland, 2005).

Purpose of Study

The purpose of this study was to understand adaptive learning environments while using technology and support high school students studying languages as novice-mid learners.

Research Questions

The research questions were:

1) What are the interpretive listening and interpretive reading skills of novice-mid language learners in technology-supported adaptive learning environment?

2) What changes are observed in the interpretive listening and interpretive reading skills of novice-mid language learners, by target group, in a technology-supported adaptive learning online environment?

Significance of Study

As schools grapple with the challenge of offering world language classes to students of varying abilities, this study contributed to our understanding of the outcomes of technology- supported, adaptive learning environments, as the interest in using technology to offer ALE continues to grow.

Limitations

This study had several limitations. To best conduct this research, knowing the participants' cognitive learning styles would yield the most accurate results. Cognitive learning styles are the essential characteristics of individuals' cognitive process (Yang et al., 2013) or more commonly known as the individual differences in preferred ways of organizing, and processing information and experience (Chen & Macredie, 2002; Rayner & Riding, 1997). Rayner and Riding (1997) suggested that special attention be given to students' cognitive learning styles, particularly when determining which activities would be best suited for various levels of competencies. Hence, students having an Individualized Education Plan (IEP) requiring special modifications, if undisclosed to teachers prior to formal instruction, could result in less accurate results. These are learning styles that are associated with a learning-centered approach to individual differences and define the aspects of learning strategies outside of the cognitive style construct (Rayner & Riding, 1997).

These learning styles lead one to question if all online platforms provide the necessary tools for completing the key activities that lead to success. Learners tend to be drawn towards a certain preference for learning due to their experiences. This study focused on predetermined modalities. Consequently, these factors could influence the outcome of the study.

The participants may not all have had the same technology skills, which could have led to a gap in this study's outcomes. However, because Chrome books, the application device that was used throughout this study, used the platform Google Apps, which is commonly known by 21st - century learners (Morquin, 2016), the participants of this study should have been able to complete the assignments. Hence, any difference among participants' final assessment scores relative to their computer skills were minor. There was also the interference of a COVID-19 pandemic when the school district mandated students to work remotely from home. Many of the students found themselves without WiFi and Internet. However, the school district was able to provide the students with temporary hotspots so that they may complete their assignments.

Definition of Terms

In this dissertation, I use the following definitions.

Adaptive instruction: An educational approach that incorporates alternative strategies for instruction and resource utilization and has the built-in flexibility to permit students to take various routes to, and amounts of time for learning (Wang & Lindvall, 1984).

Adaptive learning: A strategy to encourage every student to meet the same rigorous standards in different ways, via online modality (Reeves, 2011; Farnsworth & Bevis, 2006).

Adaptive learning environment: A system based on an object-oriented framework that composes personalized learning content by considering individuals' knowledge level and the difficulty level of the learning objects (Yang et al., 2013; Tseng, et al., 2008).

L1: Primary language- a term derived from bilingualism theory (Catford, 1998).

L2: Second language- a term derived from bilingualism theory (Catford, 1998).

Baseline data: Initial information available to teachers about their students' performance. This data is collected at the start of the new school year.

Differentiated instruction: An approach to teaching that advocates active planning for student differences in classrooms **(**Reeves, 2011; Tomlinson & Strickland, 2005). "A strategy to encourage every student to meet the same rigorous standards in different ways" (Reeves, 2011).

Growth target: Academic growth expectations a teacher sets for groups of students in a class or course. This type of goal establishes different growth expectations for each group of students (SCDOE, 2015).

Natural approach to language teaching: The natural approach to language teaching requires two sorts of linguistic knowledge- *acquisition* and *learning*. Acquisition is the process that leads to subconscious knowledge about language, a "feel" for correctness (Terrell, 1986). Learning results from conscious attention to some part of the target language (Terrell, 1986). Accordingly, in a natural approach classroom, there is an attempt to provide students with opportunities for types of linguistic knowledge.

Multi-level instruction: Teaching one primary objective to the entire class while allowing for varying outcomes for one or more individuals (Ready & Lee, 2006). Multi-level instruction allows for the delivery of on-grade level, standards-based instruction- with

modification whenever necessary to individuals performing below or beyond the primary objective (Ready & Lee, 2006).

Online learning: Used by Joseph Terantino (2009), the term "*online learning* takes place in an Internet-based environment using computer-based technologies, and communication. Generally, in this type of learning, there are no class meetings with the instructor. Online learning is also referred to as e-learning or online education" (g. 12).

Student learning objective (SLO): A five-step process that guides the evaluation of student academic growth throughout the course for the instructional interval (SCDOE, 2015).

Student learning outcomes: Teacher-driven, student-centered, data-informed, and standards-based goals that measure an educator's impact on student learning growth within a given interval of instruction (SCDOE, 2015).

Tiered assessment: Student outcomes or growth target is tiered to demonstrate growth for students that perform at various levels (SCDOE, 2015).

Organization of the Dissertation

The dissertation is presented in five chapters: Introduction, Literature Review, Methodology, Findings, and Conclusion. Chapter I introduces the rationale for conducting this research and the student achievement challenges that language educators confront with learners of varied learning preferences. It further discusses the application of an ALE. Finally, it presents the limitations of the study in the context of research and practice.

Chapter II presents the theories and hypotheses that have been tested to address the impact of an ALE (Yang et al., 2013). It focuses on several conceptual frameworks

addressing the topics of learning, with technology concerning language acquisition. Chapter II also offers a transformative paradigm for addressing traditional classroom instruction through an ALE. The articles in Chapter II were specifically chosen because the concepts are all interrelated. Glanz (2010) has posited, "A theory is a set of interrelated concepts, definitions, and propositions that explains or predicts events or situations by specifying relations among variables" (n.d). Chapter III discusses a non-experimental quantitative design, which is most appropriate for conducting this study, Chapter IV presents the findings of the study, and finally Chapter V discusses the Implication of the findings, and my recommendations.

Closing Summary

While employing a postpositivist framework, this study focused on the overarching theme of adaptive learning as it explored the impact of adaptive learning with technology in language education and if it created a difference in the outcomes of traditional classroom instruction (Lamport & Hill, 2012; Yang et al., 2013). As policymakers require schools to demonstrate adequate yearly progress (SCDOE, 2013), the creation of ALE could increase students' linguistic skills, evidenced by the graduation rates (SCDOE, 2013).

Chapter II

Literature Review

Common Core Standards claim, “Students who are college and career ready in reading, writing, speaking, listening, & language…employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use and tailor their searches online to acquire information efficiently, and they integrate what they learn using technology with what they learn offline” (National Governors Association & Council of Chief State School Officers, 2017, ELA standards introduction). As technology develops, the instructional methodologies are changing (Warren & Holloman, 2005). Moreover, the effectiveness of technology application is increasing to address the needs of diverse learners found in public schools. However, Inan and Lowther (2010) put forth, “There is insufficient empirical support to claim that access to technology has either increased test scores or improved the quality of instruction to enhance student learning” (p.1).

This literature review will begin by addressing information communication technologies, and the three platforms that will be used to create an ALE - Bien Dit!, Google, and Classcraft. Next, this review will introduce the standards that mandate what South Carolina public school teachers are required to address in order to achieve language competency in the classroom. There will also be a discussion on how a teacher's characteristics and perception of technology influences learning. In addition, this Chapter will include the benefits and challenges of technology and the opportunities for internet-based grammar instruction. Learning theories will be explored as well, focusing mostly on ALE and the characteristics that define an adaptive learning environment and

the issues relating to multi-level classroom instruction. Finally, this review discusses ALE as a form of differentiation.

Information and Communication Technology (ICT)

Public school educators feel they are being forced to find alternative methods to maximize student engagement and achievement as a result of state and legislative mandates. These mandates require them to infuse technology into their curriculum to increase student outcomes and completion. (L. Maignan-Gibson, personal communication, September 2014). The South Carolina Department of Education (SCDOE) states, "Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions" (SCDOE, 2013). Information and Communication Technology (ICT) - technology that provides access to information through telecommunications (Christensson, 2010) is similar to Information Technology (IT), but focuses primarily on communication technologies. ICT includes the Internet, wireless networks, cell phones, and other communication mediums (Christensson, 2010). Educators can infuse ICT into instruction through distance learning application- a method for "teaching something from a distance, rather than face-to-face, such as correspondence courses, teleconferencing, or online classes" (Farnsworth & Bevis, 2006, p. 119). ICT can also be applied through E-learning- a global term comprising of online courses and distance learning by other electronic methods, as well as, the use of ICT to support teaching, and learning (Hill, 2010). This study focused on the application of Information and Communication Technology (ICT) with the use of learning platforms consisting of Google Drive and Google integrated Apps, Classcraft, as well as, Bien Dit! Online

Learning (DeMado, Champeny, Ponterio, & Ponterio, 2008) - methods to support teaching and learning. Many schools do not have the budget to implement expensive and sophisticated adaptive learning platforms. These technologies are comparable to those in classrooms nationally, and they approximate an adaptive learning environment with the active engagement of the instructor.

Virtual learning environment (VLE). Online learning is also known as virtual learning, and the geographical separation of student and teacher and whereby communication is conducted through technological media such as computers (AAUP, 2014). More importantly, virtual learning may employ computer software consisting of an announcement board, chat room, and a grading system that collectively make up an online delivery system (Farnsworth & Bevis, 2006). A virtual learning environment (VLE) is also comprised of a set of teaching and learning tools designed to enhance a student's learning experience through the use of computers and the Internet during the learning process (Rouse & Holyoke, 2011). The principal components of a VLE are student tracking, online support for both teacher and student, electronic communication (e-mail, threaded discussions, chat, Web publishing), and Internet links to outside curriculum resources (Rouse et al., 2011).

The focus of this research was on ALE through the application of a virtual learning environment (Willis, Lynch, Fradale, & Yeigh, 2018) where the teacher sees what students see, and has additional user rights to create or modify curriculum content and track students' performance. A virtual learning environment along with these processes will, in turn, create an ALE. While there are several commercial VLE software packages available- including Blackboard Connect, WebCT, Lotus LearningSpace, and

COSE- this research will utilize the Bien Dit! Online Learning, Classcraft, and Google platforms.

Devery's (2015) grounded theory study facilitates an understanding of what spearheaded the concept of an ALE. Devery defined adaptive learning in the way of "individualized learning practices as actions, activities, and procedures performed by faculty and administrators at the course, program, and institutional levels that assist students as they progress through a higher education institution" (p.7). Although Devery's study was on higher education, Devery's research focused on the efforts of administrators and faculty. Thus, it was also relevant to the K12 context. He does contend, however, that individualized learning is "student-centered" and- consisting of "...institutional *academic* and *nonacademic* practices and policies that assist students as they progress through the higher education system (p.18). Therefore, this research offers the following clarification- *adaptive learning* is a process that allows for "self-directed modification of online instructional activities based on students' aptitude to increase performance that will promote student *learning outcomes*" or an increase in students' performance following completion of categorical interactive activities as determined by diagnostic assessment (Girault, 2014). This definition does not negate the role of the teacher. On the contrary, the teacher dictates, through his/her actions, the assignments reconciling his/her role in a self-directed classroom. Hence, the common elements of adaptive learning theory that drive the student towards learning achievement are (a) student-centered instruction (Devery, 2015) where learning is cooperative, (b) collaborative, and community-oriented; (c) allowance for time (Wang & Lindvall, 1984) to process and complete assignments at (d) student's own learning pace; and (e)

flexibility, that gives students choices of assignments that will promote growth and completion of those assignments (Tomlinson & Strickland, 2005), Moreover, the following assessment tools will be implicitly integrated into the activities to be completed so that students' aptitudes can be assessed by their: (a) verbal communication skills; (b) intellectual skills; (c) cognitive strategies; (d) motor skills; (e) attitudes (Briggs et al., 1992); and (7) not be restricted to grades and scores (Rust, 2002).

Google. Because Bien Dit! is restricted to a limited number of specific textbook exercises and does not allow for more custom-designed, collaborative activities, a different medium was required. Google, a commonly known search engine, has evolved with the emergence of digital technologies as an empowering medium for change in education (Rowe et al., 2013). As a result, educators are employing Google to reinforce didactic teaching by improving the efficiency of content delivery using the components of Google Apps as a Learning Management System (LMS). Google Apps is an office suite that permits the collaborative editing of documents, spreadsheets, presentations, drawings, and forms enabling multiple authors to work together in real-time (Rowe et al., 2013). Google Apps comes with several different software applications- Google Docs, Sheets, Hangout, Draw, Classroom, and Slides- as components for communication.

Google Apps alone is not adaptive. In order to be adaptive, the teacher must be able to access, review, and modify assignments in the applications where students have access. Teachers must have the necessary additional user rights to create and modify curriculum content and track students' performance (Rowe et al., 2013). This will then create an ALE that will differentiate instruction to meet students' learning needs

(Tomlinson & Strickland, 2005). It is at the teacher's discretion, which assignments need to be modified, and resources need to be assigned within the Google Apps.

Classcraft. As an Engagement Management System (EMS), Classcraft uses motivating gaming principles to create a positive student experience (Classcraft, n.d.). Students are put in control of their learning process, reinforcing collaboration, streamlining classroom management, and building a better learning experience (Classcraft, n.d.). Classcraft can be integrated with Google Classroom, making it easy to import assignments, track student progress, and award points when students complete their work. Moreover, it can be tailored to the teaching style of the teacher and the learning style of each student within the classroom by personalizing teacher's lesson plans making them self-paced learning adventures that adapt to the individual student's mastery of the subject (Classcraft, n.d.).

In this study, Classcraft was used to differentiate instruction by allowing the teacher to redirect low-tiered students to complete review exercises for reinforcement, and directing mid and upper-tier students towards accelerated progress by encouraging them to move forward beyond the average classroom assignments. Besides, students were able to choose their assignments according to their unique learning style. In addition, teachers can accommodate students' difficulties and transform their lessons to meet a student's ability.

Standards

As per the South Carolina World Language Proficiency Standards (SCDOE, 2013), "Every learner will use a world language, other than English, to engage in meaningful, intercultural communication; understand and interpret spoken and written

language; and present information, concepts, and ideas in local and global communities. Through learning another language, they will gain an understanding of the perspectives of other cultures and compare that language, and the associated cultures learned, with their own." (p. 5). In addition, the standards provide examples of learning targets for each competency that educators can use regardless of age, class level, or content studied (See Table 2).

Although there is very little evidence on the extent to which K-12 teachers' assessment practices reflect national and state standards (Kaplan, 2016), in a multiple case study examining how classroom-based assessments provide insight into students' progress toward achieving competencies, Kaplan discovered that the interpretive mode of communication was the second most frequently assessed mode by the participants. Interpretive reading was assessed more than twice as many times as interpretive listening (Kaplan, 2016). Similarly, this study will address the World-Readiness Standards for Learning Languages by focusing on the interpretive reading and listening modes of communication. This present study not only extends on previous research but also in the world language classroom. This study focused on interpretive reading and listening because these are the two areas in which most language educators tend to focus on with little consideration for students who are cognitively and linguistically challenged. More importantly, no research has looked at these two areas within the context of adaptive learning.

These World-Readiness Standards for Learning Languages (The National Standards Collaborative Board, 2015) were used as a framework to develop and guide students' assignments. Students were assigned different auditory and auditory tasks

through Google Classroom. To reflect the standards, reading and listening tasks derived from thematic units based on the Bien Dit! learning (DeMado et al., 2008) curriculum. Specific oral and auditory assignments from Bien Dit! were written, copied, and placed in Google Classroom along with instructions on how to proceed. Google classroom, having an email feature, will notify students of their assignments. Students will have the option to use certain apps within Google.

Language competency. The South Carolina World Language Proficiency Standards (SCDOE, 2013) align competencies to each standard according to the overall level of the student. There are 11 student levels, including Novice, Novice-Mid/Novice-High, Intermediate-low, Intermediate-Mid, Intermediate-high, Advanced-low, Advanced-mid, Advanced-high, Superior, and Distinguished. For each of these levels, SCDOE guides with specified competencies addressing Interpretive Communication, Interpersonal Communication, and Presentational Communication. This study addressed the two most wildly considered standards Interpretive Listening (IL) and Reading (IR), (The National Standards Collaborative Board, 2015, p. 15) (See Table 2). Again, language educators seldom focus on these two areas with little consideration for students who are cognitively and linguistically challenged.

The standards provide a cross-check to ensure that each mode of communication and skills that are addressed at each level and to clarify what learners need to be able to do in order to move from one level to the next using “Can do” statements (The National Standards Collaborative Board, 2015). This process occurs while using real-life applications from novice-mid to novice-high proficiency. When using the “Can do” statements, the standards are not merely a strategy but instead work as a rubric for

measuring the strategies used. “I can” statements- the core competency- ensures that all elements of language learning are appropriately balanced (The National Standards Collaborative Board, 2015).

To align the standards to this study, and to South Carolina World Language Proficiency Standards let us look at Table 2. Table 2 illustrates the lesson objective or what the student is expected to know by the end of the lesson. To address the learning target of “I can understand when my friends greet me at school,” students were able to work either individually or collaboratively using a group chat to complete interactive activities on audio and video, multimodal platforms. Using Chrome book and Google Hangout, students listened to others speak in the target language and responded, and then recorded their interactions using a webcam for reinforcement. Using the theory of adaptive learning, activities were made adaptive by designing and administering a short personality quiz to match up individuals so that they could have a better experience. To align the activities with students’ Tier placements, for example, lower-tier students were paired together according to their pre-test scores. Students communicated while addressing the interpretive mode (The National Standards Collaborative Board, 2015).

As the ALE was designed, the standards were used as the mission and vision that drives the language-learning process (The National Standards Collaborative Board, 2015). The benchmark statements established the expectations for learner performance at the identified proficiency level. The learning indicators identified measurable, attainable goals. The learning targets were of real-world contexts that can facilitate and motivate language learning. In this study, the learning targets were addressed using technology to adapt the instruction to the students’ learning needs creating an ALE.

Table 2

Alignment of Assignments with World Readiness Standards for Learning

Standards: Novice Mid – Novice High: Every learner will use a world language, other than English, to engage in meaningful intercultural communication, understand and interpret the spoken and written language, and present information, concepts and ideas in local and global communities. Through learning another language, they will gain an understanding of the perspectives of other cultures and compare the language and cultures learned with their own (SCDOE).

Interpretive Mode of Communication	Language Competencies NOVICE-MID	Proficiency level (Benchmark)	Performance Indicators	Sample Learning Target
ACTFL World Readiness Standards	Interpretive Listening (IL) and Reading (IR) Learners understand, interpret, and analyze what is heard, read, or viewed on a variety of topics.	I can identify the general topic and some basic information in both very familiar and everyday contexts by recognizing practiced, and or memorized words, phrases, and simple sentences in texts that are spoken, written, or signed.	I can identify some basic facts from memorized or familiar words and phrases when they are supported by gestures or visuals in conversations.	I can understand when my friends greet me at school.

Table 2 (Continued)

Interpretive Mode of Communication	Language Competencies NOVICE-MID	Proficiency level (Benchmark)	Performance Indicators	Sample Learning Target
South Carolina Standards	Interpretive Listening (IL) & Reading (IR): I can interpret information, concepts, and ideas from a variety of culturally authentic sources on a variety of topics.	NM.IL I can recognize some familiar words and phrases when I hear them spoken.	NM.IL.1 I can understand a few courtesy phrases.	NM.IL.1 I can understand greetings. I can understand when people express thanks. I can understand when people introduce themselves.
			NM.IL.2 I can recognize and sometimes understand basic Information in word and phrases that I have memorized.	NM.IL.2 I can identify days of the week and the time. I can recognize a date. I can recognize some common weather expressions.
			NM.IL.3 I can recognize and sometimes understand words and phrases that I have learned for specific purposes.	NM.IL.3 I can recognize the names of the planets in science class. I can recognize the names of some parts of the body in a health class. I can identify scores from sports terms because I recognize team names and logos. I can identify artists, titles, and music genre from iTunes.
		NM.IR.1 I can understand some learned or memorized words and phrases when I read.	NM.IR.1 I can recognize words and phrases and characters with the help of visuals.	NM.IR.4 I can recognize entrance and exit signs. I can identify family member words on a family tree. I can identify the simple labels on a science related graph. I can check off words and phrases on a to-do list, grocery list, or scavenger hunt list.
			NM.IR.2 I can recognize words, phrases and characters when I associate them with things I already know.	

Benefits and challenges of technology. In the context of language learning, classroom time is not enough. It is essential for students to have access to opportunities and resources outside of the classroom that will enable their expansion of knowledge and independent learning beyond the classroom. Online technology is the efficient and expedient method for doing so while providing authentic contemporary cultural audios and videos (Negoescu & Boştină-Bratu**,** 2016). Negoescu and Boştină-Bratu (2016) observed that, while on the one hand, adequate use of technologies enhances classroom communication and interconnectivity, and offers students the opportunity to communicate, collaborate, and interact with course material in different ways (p.3). However, on the other hand, they also inform us of the shortfalls of technology. Students tend to encounter difficulties with online software and experience a lack of direct contact with teacher support.

Romano (2003) noted other challenges with the effective use of online technology- lack of a typical use of technology in the classroom; perception of online technology as a threat to teacher employment; educational leaders' misconceptions of how teachers would adapt technology in the classroom and their lack of comprehension of its practical use in the teaching and learning process; and, inadequate use and lack of failure analysis (Negoescu & Boştină-Bratu, 2016, p. 23). The National Common Core State Standards have addressed many of these challenges related to online technology curriculum and integrating this technology into instruction. This research will explore the efficacy of technology integration.

Internet-based grammar instruction. Mohamad (2009), through observation and experimentation, studied the effectiveness of internet-based grammar instruction

(IBGI) on the learning of grammar. Seeking to find "optimal conditions for overt teaching of grammar" (Mohamad, 2009), Mohamad offered the Internet as the answer to differences in motivational levels, exposure, and transfer from first to second language acquisition. Mohamad acknowledges the advantages of using the Internet, such as with advanced learners tackling challenging tasks to meet their needs, while less proficient learners can access notes on specific websites on their own or with the help of a teacher, hence justifying the need for researching the effectiveness of IBGI on the learning of grammar. Although grammar instruction is not directly addressed in the World-Readiness Standards for Learning Languages (The National Standards Collaborative Board, 2015), in the study, the intervention required students to complete grammar activities in an effort for students to achieve the interpretive reading language competency. Similar to that of Mohamad's IBGI, encouraging the use of the Internet to study grammar, adaptive learning environments will give students the opportunity to receive instant feedback, current information on the content being studied, and a multitude of explanations and examples that can be accessed without the supervision of an instructor. Son (2008) offered, "The multimedia nature of the World Wide Web, in particular, has greatly expanded the power of computer-assisted language learning (CALL) by allowing learners to explore and discover their learning paths themselves and offering them easy access to an online database of resources" (p. 1). Hence, this study can only add to the benefits of CALL.

Teachers' Characteristics and Perception of Adaptive Learning Environments

This study on ALEs called for a review of research that resulted in the implementation of online technology integration in the classroom. In their study on the factors affecting online technology integration in K-12 classrooms, Inan and Lowther (2010) examined the direct and indirect effects of teachers' characteristics and their perception of the environmental factors that influence online technology integration in the classroom. Inan & Lowther (2010) studied the effects on 1,382 Tennessee public schools using a path model consisting of four criteria: 1) teacher demographic characteristics and school characteristics related to supporting online technology integration, 2) teachers' computer proficiency, 3) teachers' beliefs and readiness to integrate online technology, and 4) online technology integration. Teacher-readiness had the most effect on technology integration, resulting in a significant direct influence and indirect effect on technology integration. Overall support and computer proficiency had the second and third strongest effects on online technology integration, respectively.

These findings are relevant to this study, as online technology integration at the research site is necessary in preparing students for 21st-Century careers (Greenville County Schools, n.d.). Consequently, the research site, a public high school, introduced the Personalized Learning Initiative (Greenville County Schools, n.d.) consisting of three criteria: 1) Paced to the learning needs of students, 2) Tailored to the learning preferences of students, and 3) Customized to the interests of students. All of these criteria are characteristics of an ALE (Wang & Lindvall, 1984). The initiative was very recently introduced in the 2017-2018 school year with the distribution of Chrome books to every student. One could infer that teacher development and training, along with the glitches of

a new technology infrastructure, may have a direct effect on the success of technology integration. However, the findings of Inan and Lowther (2010) suggest that overall teacher support- and computer proficiency defined as teachers' perceptions of their computer ability level- have the second and third highest positive effect on online technology integration. On the other hand, teachers' readiness, defined as teachers' perception of their capabilities and the skills required to integrate online technology into their classroom, had the highest total effect.

Instructor influence. Kissau and Algozzine (2015) conducted research comparing the efficacy ratings of teacher candidates completing L2 methodology instruction in one of three different delivery modes (F2F, online, and hybrid). In his study, he addressed teachers' confidence or perceived ability to complete tasks otherwise known as candidate self-efficacy (Bandura, 1986). Self-efficacy (Bandura, 1986) can be used to examine teachers' belief in their ability to teach online courses while achieving their goals and objectives (Inan & Lowther, 2010). Kissau and Algozzine (2015) found that teacher candidates in the hybrid course experienced significantly comparable outcomes in self-efficacy during their hybridized methodology instruction than did their peers who completed the same instruction in a F2F or online setting. Kissau and Algozzine's research supports this study as it relates to the observed characteristics of instructors to whom students are exposed. Although instructors account for an insignificant portion of student performance, during the study, students expressed a preference for teacher involvement in the online course.

Assessment

There tends to be a misconception that assessments and grades are the same- this is not the case (Delmont, 2016). *Assessments* are based on the gathering of information about students' performance, and *Grades* draw upon the assessment data and are usually the result of students' performance. Assessments demonstrate "accumulated proficiency" of the lesson goals and objectives. This study will look at students' summative assessments as what instructors would put into their grade-book and demonstrate accumulated proficiency related to the identifiable content goal(s). Also, because not all assessments need to be scored, in this study, diagnostic assessments or placement tests were not included in the final grade calculations because students were held accountable for something that they had not yet learned. Moreover, generally, these grades are not part of the instructor's grade book.

Online learning addresses unconventional assessment criteria as dictated by the adaptive learning platform. Online learning affords students opportunities for self-directed learning, allowing for modification of activities to suit the student's learning needs based on their interest. It can be manipulated to meet the students' initial proficiency level and allow them to work at their own pace (Wang & Lindvall, 1984). It allows for repetition of activities, and extended time as weaknesses are identified (Forsyth et al., 2016). As adapted learning platforms dictate, the ability to modify, reinforce by repetition, and extend time, all lend themselves to increase student outcomes (Yang et al., 2013). Willis et al., (2018) posits that digital tools can be used to potentially make the learning process more efficient, more engaging, more personalized, more adaptive, and more widespread.

Adaptive Learning Theory

Waxman et al. (1985) examined the effects of adaptive education on student outcomes in elementary and secondary schools over nine years from 1973 to 1982. Waxman et al., (1985) found that the average adaptive program score was at the 67th percentile of control group distribution and "the effect appeared constant across grades, socioeconomic levels, races, private and public schools, and community types" (p.1). Nevertheless, the effects were also constant across the categories of adaptiveness, social contexts, and methodological rigor of the studies (Waxman et al., 1985). As a result, Waxman et al. introduced seven characteristics of instructional programs, which were necessary to define their study of adaptive education. This present study took into consideration these same seven characteristics; detailed herewith, to not only define an adaptive study but also to identify an *adaptive learning environment* where appropriate data is generated for the analysis of student learning outcomes.

First, an adaptive learning system contains materials and procedures that permit each student to make progress in mastering the curricula at a pace suited to his or her abilities and interests (Wang & Lindvall, 1984). These materials and procedures address, not only assessment, but also student progress, which was measured during this study. In an ALE, if the research reveals the influence of online learning, instructors will be able to modify assessment based on students' strengths and abilities.

Second, this language study platform can be manipulated to meet the participant's initial proficiency level (Wang & Lindvall, 1984). Third, the software should allow periodic evaluation of self-responsibility for diagnosing their current needs and abilities (Wang & Lindvall, 1984). Fourth, it should allow for planning and pursuing individual

learning activities (Wang & Lindvall, 1984). Fifth, it should allow for evaluating mastery. It should encourage student's assumption of self-responsibility to diagnose their current needs and abilities in order to plan and pursue individual learning activities and interests (Wang & Lindvall, 1984). This research will require formal assessments throughout the study for the review of participants' completed assignments and measured progress. Sixth, an adaptive learning platform should have alternative learning activities and materials for aiding students' acquisition of academic skills and content (Wang & Lindvall, 1984). Finally, an adaptive platform should allow students to assist one another in pursuing individual goals and provide an opportunity to work in collaboration to achieve group goals (Wang & Lindvall, 1984).

Adaptive learning is not to be confused with the concept of adaptive instruction. Adaptive learning is a student-directed model used during the online modality that requires very little to almost no teacher intervention and allows students to play a dominant role in their lessons. Nevertheless, the characteristics mentioned above described by Wang and Lindvall (1984), not only distinguished between adaptive instruction and adaptive learning but also identified the student populations best-suited for this study of adaptive learning environmental outcomes and the role of the learner versus that of the instructor.

Waxman et al., (1985) examined the outcomes of 7,200 students in 38 different studies while collecting data on the effects of adaptive education on student outcomes in a naturalistic setting (Terrell, 1986). This recent research, however, was conducted using the linguistic platform, Bien Dit! (DeMado et al., 2008), which addresses the five C's of the national standards- communication, cultures, connections, comparisons, and

communities- while offering a natural approach to learning a language (Terrell, 1986). This quantitative study entailed the synthesis of outcomes resulting from students' diagnostic assessment scores and their post-test scores upon completion of the intervention of an ALE

Adaptive learning environments as a form of differentiated instruction. Hollins and Foley (2013) referred to the characteristics of a software and its ability to be effective, efficient, and satisfying to the user as usability (p.123). Similar to online learning that requires students to have special features for navigation and completion of specific activities in order to succeed, students with linguistic learning needs, require certain directives and skills to succeed. One may argue that a student's inability to speak a language does not necessarily make them disabled. Hollins and Foley (2013), however, defined students with "learning disabilities" as those who experience academic difficulties. Those problems, if and when they occur during language instruction, would confirm that the language learner is facing challenges that could otherwise lead to adverse outcomes. Although Hollins and Foley conducted their study at the higher education level, these strategies are also required at high schools where there are students with disabilities requiring specific learning directives and skills to succeed (SCDOE, 2015) even in the language classroom. To address learners of varying aptitude, instruction must be differentiated. In other words, teachers must plan and design lessons that advocate for student differences in the classroom (Tomlinson & Strickland, 2005). An ALE may be used to differentiate instruction to meet the needs of these students.

Tomlinson and Strickland (2005) addressed differentiated instruction- an educational structure that addresses learning differences among students by providing

flexibility in the levels of knowledge acquisition, skills development and types of assessment items undertaken by students. This theory strongly supports the 21st -century student learners (SCDOE, 2017). 21st -century learners, a concept of 21stcentury initiatives, (SCDOE, 2017) are amongst a progressive multicultural society. Technology, one of the seven literacies (SCDOE, 2017) required of 21st -century learners, is quite relevant to this study. The 21st century learner must be able to self-guide and work independently- two skills that are facilitated through technology (Yang et al., 2013). They must be able to expand their experiences beyond the classroom and apply them to their everyday lives (The National Standards Collaborative Board, 2015). Hands-on, concrete evidence, documentation and compilation of data are essential for being kept informed and directing their learning in order to be college and career ready (National Governors Association & Council of Chief State School Officers, 2017).

The 21st- century initiative has mandated an approach used to lead student learners. Traditional face-to-face instruction presents many barriers to learning (Schuh et al., 2011). Therefore, at a public institution- where the classroom is designed for students of various experiences, orientation, self-concept, motivation, readiness to learn, and learning styles- the learning environment must be restructured to benefit all learners (Tomlin, 1984). Before online technology, differentiated instruction was a manual practice. As online technology evolved and was integrated into instruction practices, an adaptive learning system was created, giving rise to an ALE (Yang et al., 2013) as the methodology was automated. Hence, the adaptive learning system has become a vehicle for differentiating instruction.

Prior to ICT, instructors have always used various assessments to conduct differentiated instruction. In addition to the traditional assessments, we now have data from adaptive learning systems that can help us in our knowledge to do an even better job with differentiated instruction. A computer program such as a vocabulary program that teaches vocabulary and tracks right and wrong words, for example, is adaptive learning. The computer is deciding what content to put in front of the student. It feels similar to differentiated instruction, but there is no instructor. So maybe adaptive learning is a version of differentiated instruction without an instructor. The results procured by the computer will inform how the teacher/instructor differentiates instruction. Both systems try to personalize the way the student is taught to maximize learning. However, environmental outcomes/results will drive instructional approaches in differentiated instructions.

Upon review of the study conducted by Waxman et al. (1985), Wang and Lindvall (1984) categorized the characteristics of adaptive education, also synthesized in my study on adaptive learning environmental outcomes. There are 1) the instruction based on the assessed capabilities or intellectual skills of each student (Briggs et al., 1992; Rust, 2002) with the identification of a tiered placement of each student, and 2) the materials and procedures that permit each student to make progress in mastering the curricula at a pace suited to his or her abilities and interests with the application of the World Readiness Standards for Learning Languages (The National Standards Collaborative Board, 2015). Of all the research questions, the one that intrigued and drove this study was, “What is the magnitude and direction of the relationship between adaptive education and student outcomes?” (Waxman et al., 1985, p. 228). Comparatively to this research, posing the

question “What changes are observed in the interpretive listening and interpretive reading of novice-mid language learners, by target group, in a technology-supported adaptive learning online environment?” are apropos for corroborating the fact that adaptive education programs yielded student outcomes at the 67th percentile of control group distribution founded by the study conducted by Waxman et al. (1985). The connection between adaptive learning strategies and student outcomes is the driving force of students’ performance yielding or not comparable learning outcomes.

Adaptive platform. Four features characterize an adaptive learning platform, which were implemented during the study: 1) feedback, 2) independent progress, 3) responsiveness, and 4) relevant data. The adaptive learning platform with adaptive contents provided feedback to the learners to encourage students to continue to perform the exercises (Forsyth, Birch, Deel, & Brauer, 2016). The exercises ranged from easy to difficult, allowing the students to progress more quickly and increase their knowledge base as they tackled the more challenging exercises (Forsyth et al., 2016). Conversely, the adaptive learning platform pinpointed weaknesses and prompted students to conduct additional exercises when ready and before advancing (Forsyth et al., 2016). The adaptive learning platform provided teachers with relevant data tracked by the adaptive learning technologies allowing instructors to know if the students were putting forth the effort to learn. It also aided the instructor identify and motivate underachieving students (Forsyth et al., 2016). The adaptive technology adapted to the level and needs of the student by providing them with questions based upon their current knowledge and grade (Forsyth et al., 2016).

While Bien Dit! was not an adaptive platform, it did provide certain features that could be adjusted to meet the individual student's academic needs without necessarily taking into account their interests and learning profile (Forsyth et al., 2016). The objective quizzes and tests in the Bien Dit! assessment program allowed for differentiation concerning students' readiness; it has alternative assessment options based on students' interests and learning profile (DeMado et al., 2008). Bien Dit! provides an Exam View Test Generator to select and modify the test questions based on three versions and levels of objective quizzes and tests: Slower-Paced, Advanced, and On-level. After the instructor determined the level at which the student should be tested, assignments were adapted according to students' readiness, by simplifying directions, reducing the number of tasks, or providing models or more closed-ended guidelines particularly for slower-paced learners (DeMado et al., 2008). Directions were revised to include a problem-solving element, make the tasks more complex, or make the suggestion more open-ended for advanced learners (DeMado et al., 2008). When addressing various learners, within the size of the population used for this study, (e.g., 37 learners), utilizing a technology-based platform made these modifications easier (DeMado et al., 2008).

Another way to adapt the assignments was to vary the language used on the evaluating instrument (DeMado et al., 2008). For example, in this study, simple sentences were applied for slower-paced learners in Tier One, simple sentences with a few adjectives and adverbs for on-level learners in Tier two, and compound sentences with adjectives and/or adverbs for advanced learners in Tier three. These adaptive strategies

facilitated interventions including review, re-teaching, maintaining, and providing additional practice, and enrichment (Forsyth, 2016).

Multi-level classroom instruction. Multi-level instruction is the process of teaching one primary objective to the entire class while allowing for varying outcomes for one or more individuals (Ready & Lee, 2006). In other words, multi-level instruction allows teachers to deliver on-grade level, standards-based instruction to an entire class, and modify that instruction, whenever necessary, for any individual performing below or beyond the current learner objective. Because public schools serve an undetermined number of students within a finite number of world language classes, it is crucial to consider the impact of class size on student achievement within a multi-level classroom environment (Ready & Lee, 2006). Unfortunately, there is not a lot of empirical data on the impact of size and student achievement on language classrooms, in particular. Therefore, this present study refers to the following studies that share similar attributes as the population used in this study of adaptive learning. These studies on learning modalities, language preference, and instructor influence are all factors that could impede on the implementation of a thriving multi-level classroom environment.

Learning modality. Reiff (1992) defined *learning modalities* as the sensory channels or pathways through which individuals give, receive, and store information. Modalities or senses consist of *visual, auditory, tactile/kinesthetic, smell,* and *taste.* Perception, memory, and sensation also comprised of the concept of learning modalities (Reiff, 1992). Researchers have come to agree that in a classroom, students would be approximately (a) 40% visual, (b) 25% auditory, (c) 11% tactile/kinesthetic, (d) 20% mixed modalities (Sanjanaashree P, Anand Kumar M, & Soman K.P., 2014). Hence, it is

evident that only 25% of the students will remember most of what is said in a classroom lecture, and primarily, another 40% of the students will remember what is seen. In light of this available data, this study on adaptive instruction with technology supports the fact that students who are visual will concentrate on the visual components of the adaptive program and those who are auditory will focus on the auditory components. This data concerning students' learning style and adaptive learning are critical, as it supports this study on ALE, which entails the act of physically manipulating tasks, does, in fact, impact students' outcomes in a traditional face-to-face language classroom. Moreover, because of the various modalities offered via online technology, students with varying aptitudes and preferences for these modalities can be easily accommodated with many opportunities for online learning.

Language preferences. American Council for the Teaching of Foreign Languages (ACTFL), within the discipline of language acquisition, acknowledges four skills typically addressed: *listening, speaking, reading*, and *writing*. These skills are not readily adaptable by all language learners. Therefore, the areas where learners demonstrate difficulty are what present students with their challenges. To address any one of these challenges, instructors must address students' learning style, predetermined by their learning preferences developed through their prior learning experience.

In her study's discussion of the hierarchy of learning style models and instrument of measurement, Curry (1999) identified the Learning Style Inventory for grades 3 through 12, used to measure learning style preferences. The Learning Style Inventory measured learning style preferences based on Kolb's (2005) six pillars to exponential learning theory (ELT), which recognizes "experience" as the key to human learning and

development (Kolb, 2005). First, learning is best conceived as a process, not in terms of outcomes. Second, all learning is relearning and best facilitated by drawing out students' beliefs so that they can be examined, tested, and integrated with new ideas. Third, learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world- conflicts, differences, and disagreements tend to drive the learning process. Fourth, learning is a holistic process of adaptation and involves the integrated functioning of the total person's thinking, feeling, perceiving, and behaving. Fifth, learning results from synergetic transactions between the person and the environment and involves assimilating new experiences into existing concepts and accommodating existing concepts to a new experience. Finally, learning is the process of creating knowledge. ELT (Kolb, 2005) proposes a constructivist theory of learning whereby social knowledge is created in the personal knowledge of the learner. In consideration of students' learning preferences, this research seeked to corroborate the effectiveness of online learning as a means for tapping into all the modalities and for creating and facilitating an ALE to reach all learners' preferences.

This research does not address learning styles per se. However, because students have an intrinsic preference for particular modes of instruction through the development of their own learning experiences, it is critical to acknowledge the relationship between learning styles and student preferences. Felder and Henrique (Sawaan, 2006 p. V) defined learning styles as how an individual characteristically acquires, retains, and retrieves information- all the skills needed for successful recall (McDermott & Roediger, 2017). Therefore, online educational platforms and modalities must provide the learner with the necessary tools to exercise their desired preference of methodology and maximize their

individual skills. Felder and Henriques focused on student-centered activities. However, Zwanenberg, Wilkinson, and Anderson (2000) as well as Yang et al., (2013) believed that "learning styles are a subset of one's *cognitive styles*, which is the measure of one's intelligence or ability, which leads to the art of *adaptive learning"* (p. 3). These are the very essence of adaptive learning that this research seeked to demonstrate through the use of online technology.

Instructor assistance. In her study of online instruction, Kegelman (2011) identified four important benefits based on student responses to a survey- controlled time when they study at 64.3%, saved travel time 52.2%, set their learning pace at 40.0%, and suited their learning style at 34.1% (p. 134)- while illustrating the characteristics of online learning. Most of Kegelman's research revolves around "is there a particular belief that there is a correlation between student achievement and online learning? However, she failed to demonstrate any correlation between students' grades and five categories: Computer Skills, Independent Learning (self-regulation), Dependent Learning, Need for Asynchronous Scheduling, and Academic skills. Moreover, Kegelman found that 100% of the students have self-reported that they asked for assistance.

Treisman (1985) would argue that especially amongst African Americans, students working independently have a cultural orientation not to ask for help, which is what is needed to succeed. They refrain from collaborating with their peers and requesting clarification of assignments by their professors, mostly failing to seek any form of assistance, all of which lead to poor academic outcomes. Adaptive instruction avoids putting students in situations where they get stuck and need an instructor to assist them in overcoming their problem. It minimizes the number of times a student encounters

any difficulty and has to seek assistance. One of the characteristics of adaptive learning specifically is that it adjusts the lesson content of particular students, which helps them succeed more when we know how resistant they are to asking for help. Kegelman's finding that 100% of the students have self-reported or asked for assistance lacks credibility. One reason is because she had a small sample and the other reason is that she was not using adaptive software. Adaptive software would have made it easier for students who are weaker in some areas to be successful.

Flexibility. In her study to discover the achievement differences between online and face-to-face instruction, Hughes (2002) postulated that "flexibility" is one of the key elements for student success in online learning (p. 38). She further emphasized, "The principal advantage for students and faculty is that learning takes place at times and places convenient to the learner" (p. 38). While an ALE calls for flexibility and collaboration, ironically, according to the National Online Learners Satisfaction and Priorities Report (Ruffalo, 2016), only 44% of the study's participants, and student population felt that student-to-student collaboration is important. Hence, from the perspective of adaptive learning theory, being *flexible* promotes student engagement while providing learning preferences- a discovery that remains to be revealed in this study of online learning (Jaggars & Xu, 2013).

Understanding student performance. In their discussion of the use of information and communication technologies (ICT) in teaching and learning foreign languages and the role of the teacher, Negoescu and Boştină-Bratu (2016) argue, " It is the teacher, not the technology who determines the quality of the learning and teaching." (p.1). To be an effective teacher, one must have the technology resources to implement the strategies

required for student success (Keane, (2015). Traditional face-to-face methods call for minimal technology resources that would help to measure their efficacy in the classroom. However, although faculty are not evaluated on their effectiveness for improved teaching (Stumpf, King, Blendinger, & Davis, 2013), they often fail to provide evidence of these resources either in their classroom or their lesson plans.

Bates and Poole (2003), also argue that teaching and learning are social processes that require communication between teachers and learners and; therefore, technology facilitates but does not replace these social processes. Because technology is not new for language learning, features of world language technology platforms have improved and become quite sophisticated over the years. Negoescu and Boştină-Bratu (2016) posited, "Under the big umbrella of ICT, there are many tools that we can include such as the projector, presentation software (PowerPoint and Prezi), videos, conference tools (Skype), blogs, wikis, online dictionaries, interactive books, interactive whiteboard, language websites, Google, YouTube, and even video games" (p. 22). Video streaming, chat rooms, and podcasts, in addition to country-to-country virtual, classroom exchanges via the Internet, have only expanded the social processes. These social processes are all part of an ALE. Traditional lectures and textbooks are no longer sufficient for reaching student interest or achievement. Combined with an effective classroom, if instructors are equipped with adaptive learning resources, students will succeed.

In conclusion, strategies to apply online technology to improve students' learning are a significant topic of this research. Mohamad's study on the magnitude and direction of the relationship between adaptive education and student outcomes (2009); the Waxman et al's study on adaptive education and student outcomes (1985); Jaggars et al's

study on the outcomes of online vs. traditional face-to-face classes (2013), and Hart et al's research on the comparison of face-to-face vs. online instruction, all employ fixed-effect models (2016), and are the studies that capture the major themes of this research. Despite these studies, there remains little research on the impact of an adaptive learning environment on student learning, particularly in the world language classroom. In this study, adaptive learning with online technology was examined for effectiveness through the demonstration of comparable learning outcomes. As a transformative paradigm to language instruction, adaptive learning with online modalities will provide flexibility, create opportunities for increasing student enrollment and persistence, and sustain language programs and study among students. Using a quantitative design, this research will demonstrate whether or not an adaptive learning environment has a direct impact on students' performance outcomes while learning a language in a traditional classroom.

Chapter 3

Methodology

The purpose of this quantitative study was to explore the impact of ALE on the learning of novice-mid language learners in a face-to-face classroom setting. In this study, online technology was integrated into the instructional units to prepare learners for successful communication in a globally connected world as dictated by 21st-century literacies and their application to world language learning (The National Standards Collaborative Board, 2015).

Setting

The experimental setting consisted of two, third-year, French classes taken by tenth and eleventh-grade students in a public high school in South Carolina. Students' placement in French Level 3 was predetermined by the regular scheduling process of the school's administration, which approximated random selection as it depended on a variety of factors unrelated to students' characteristics. World Language is compulsory in South Carolina (SCDOE, 2017). Data was gathered on the entire student population of French Level 3 language learners. There were two periods of French 3 classes taught throughout the day totaling approximately 50 students, all of whom participated in the ALE model.

The South Carolina Department of Education (SCDOE) categorizes all students into three tiers- High Performers, Average Performers, and Low Performers (SCDOE, 2015). Following teacher recommendation, and after the school administration had determined the placement of students in the two French Level 3 classes, this study entailed the administration of a pre-test to both groups to ensure that the students were

novice-mid learners. If the pre-test had revealed that they were not, adjustments were made to ensure proper placement moving them either lower or higher on the ACTFL grading scale.

Tiered growth target. SCDOE used tiered growth targets to allow for the demonstration of growth for students that performed at various levels and also addressed individual learners (SCDOE, 2015). Tiered growth targets included all students but at varying degrees of expected growth. This study began with a population having three tiers categorized according to the SCDOE: 1) High performers 2) Average performers and 3) Low performers. After analyzing students' pre-assessment results, the researcher categorized the students according to their percentage outcome earned on the pre-test. The low-tier contained students who earned 65% and below. The average tier consisted of students who earned between 66%-75%, and those who earned 76% and higher fell under the high tier. At that stage of the research, learning outcomes were defined as teacher-driven, student-centered, data-informed, standards-based goals that measured an educator's impact on student learning within a given interval of instruction (SCDOE, 2015).

Research Questions

Two research questions drove this study. These questions were related to the ability of students to succeed in world language class while taking into account their specific learning abilities and their performance levels based on their pre-assessment scores.

Research Question 1: What are the interpretive listening and interpretive reading skills of novice-mid language learners in technology-supported adaptive learning environments?

Research Question 2: What changes are observed in the interpretive listening and interpretive reading of novice-mid language learners, by target group, in a technology-supported adaptive learning online environment?

Research Design

This study used a non-experimental quantitative design. This dissertation describes a study to understand the relationship of ALEs and the acquisition of interpretive listening and reading skills in novice-mid language learners. Unlike an experimental study, non-experimental research cannot find cause-and-effect relationships and cannot manipulate the predictor variable, such as ALE or the subjects (Creswell & Plano-Clark, 2011). Non-experimental designs rely on interpretation, observation, and interaction to draw a conclusion.

This study employed a descriptive quantitative design using data on pre and post-test scores gathered from a traditional classroom operating as an ALE. The data derived from the instructional student assessment outcomes. Students' results on the pre-test served as their baseline score, and their target growth were projected because the SCDOE required teachers to set projections (SCDOE, 2015).

The study was limited to nine weeks of instruction and based on one to two thematic units and the application of curricula found in the Bien Dit! language platform (DeMado, Champeny, Ponterio, & Ponterio, 2008). At the start of a nine-week instructional period, the target population received a pre-test to assess their prior learning

experience, which established their baseline for placement in a low, average, or high-performance tiers (SCDOE, 2015). At the end of the ninth week, a post-test was administered, and the results analyzed for comparison. It focused on public school students learning French as a second language.

Participants. Data was gathered on the entire student population of French Level 3 language learners. There were two periods of French 3 classes taught throughout the day totaling approximately 50 students, all of who were subject to the ALE French Level 3 learners, according to ACTFL, were students who had completed two full years of high school foreign language studies and should have placed at Intermediate Mid-level. However, it should be noted that within the Novice level, there were four sub-levels. Even though learners often progress through the Novice level within a year or even a semester, gaining Intermediate-level proficiency requires considerably longer timeframes – multiple years or semesters (The National Standards Collaborative Board, 2015).

This population of French 3 learners ranged from levels 1 to 4 within the Novice-Mid category. As a result, they were an appropriate population with which to conduct this study because of their prior learning experiences and inconsistent exposure to the study of languages. Some students had participated in immersion programs in elementary schools in the United States. Similarly, some had traveled or lived abroad, some had never received language instruction before their arrival at the research site, and some spoke another language other than English at home. There was a wide variety of levels and abilities amongst these learners making their progress a challenge to address in a traditional classroom.

Intervention

The target population received a pre-test to establish their baseline for low, average, and upper tiers. The pre-test consisted of questions selected from a test generator known as ExamView 4.0, a feature assessment tool of the Bien Dit! text series (Delmont, 2016). These questions were modified according to the expected prior learning from French Levels 1 and 2. Based on the outcome of the pre-test, the selection of assignments and other learning exercises were adjusted to maximize learning and inform the outcomes. This study used the Bien Dit! and Google Apps to create this adaptive platform. Irrespective of the learning methodology employed, the same rigorous curriculum was applied, and states standards were respected (SCDOE, 2015).

Upon review of benchmark assessments throughout the instructional term, this study modified, dismissed or replaced assignments using online technology to differentiate instruction and facilitate the learning process (DeMado et al., 2008). For example, during collaborative group exercises, the students were divided into breakout rooms. The teacher would enter each breakout room to facilitate discussions and lead projects while posing questions for assessing comprehension. Following the discussions, the students completed written assignments based on the learning topics with various scaffolds to meet each student’s learning needs. To assess students' performance, a rubric was used to check off the task's completion (See Appendix A).

At the end of the ninth week, a post-test was administered, and the results analyzed for comparison. Table 3 illustrates how online technology was used during the study to make the instruction adaptable to the students within the context of the SCDOE Standards for World Language instruction.

In Table 3, the first column addresses the mode of communication for the learner benchmark. This study addressed the interpretive listening (IL) and reading (IR) modes of communication (SCDOE, 2015) also recognized as two of the four linguistic skills (The National Standards Collaborative Board, 2015). Usually, the modes of communication that linguists suggest are most critical to all novice learners speaking and listening (The National Standards Collaborative Board, 2015). Nonetheless, this study addressed listening (IL) and reading (IR) as they were the two modes suitable for an adaptive learning platform, when assessing learners' ability to understand, interpret, and analyze what was heard, read, or viewed on a variety of topics (SCDOE, 2015). The Interpretive Communication modes adapted instructional strategies such as- Total Physical Response, Language Ladder for expressing degrees of interest, Communication Gap activities, Paired activities, Cooperative Learning, and Questioning strategies (yes/no, either/or, multiple-choice, one word/short answer) (SCDOE, 2015). These strategies were replicated using an adaptive learning platform with online technology integration. The remaining competencies were not addressed because the research site assessment protocols did not allow sufficient time to neither assess students on these competencies nor to grade the tests, upon completion, in order to prepare and publish the results (SCDOE, 2013). By posting these learning targets, teachers could model behavior that leads students to become autonomous learners (SCDOE, 2013).

Column two contains the learning or performance indicators that learners needed to be able to execute in order to move from one level to the next using "Can do" statements (The National Standards Collaborative Board, 2015). The "Can do" statements served as a tool for measuring the instructional strategies used. More importantly, "I can"

statements ensured that all elements of language learning were appropriately balanced (The National Standards Collaborative Board, 2015). Column three presents the actual "I can" statements that were used during the study. They are learning targets that derived directly from the thematic units found in Bien Dit! text and assessment programs (DeMado et al., 200).

Columns four and five detail the activities that were implemented per the thematic units and the online technology that were employed to form the adaptive learning system (Wang & Lindvall, 1984). In addition to the online technology tools, the thematic units also directed students to specific websites for accessing appropriate activities as per the World Language standards (SCDOE, 2015). Websites such as youtube.com or audio-lingua.eu served as visual and audio tools for providing photos of people from both the student's culture and target language culture, (SCDOE, 2015).

Finally, column six details the adaptive learning elements that were applied to make the exercises adaptive. An adaptive learning system can be used for customized projects such as communicating with a pen-pal (Forsyth et al., 2016). Column four, for example, states that students work on the interpretive reading mode of communication by drawing a simplified floor plan and labeling appropriate vocabulary. In a traditional classroom environment, students used a pen and paper. In the ALE; however, teachers allowed the use of electronic sources such as those listed in column six, to expedite the process. The online technology allowed for automated correction of spelling, grammar, and syntax (Forsyth et al., 2016). In addition to auto-correction, an ALE permitted instantaneous feedback and the communication can be repeated as many times as needed

for reinforcement and ultimate transfer of learning of the discussion topic (Forsyth et al., 2016).

Table 3

Activities and Adaptive Instructional Strategies

Interpretive Mode of Communication Learner Benchmark	Learner Indicator Performance Indicator	Implemented Learning Targets (Use actual unit test contents) French Level 3	Activity	Technology	Adaptive Element (How does the teacher make students more efficient in their learning?
NM.IL I can recognize familiar words and phrases when I hear them spoken.	NM.IL.1 I can understand a few courtesy phrases.	I can express likes, dislikes, and preferences.	Tier 1: Students will draw a simplified floor plan and label appropriate vocabulary. Tiers 2 & 3: Students will create a "Word Wall" & copy new vocabulary directly on paper. Posted list will be used to give visual cues to students when they are searching for new vocabulary.	Google Draw Developing vocabulary Google App (E.g., Flippity) Google Translator Videos and Podcasts	Intervention include but not limited to review/ reteaching. Option -Listening: DVD Program, Media Guide, Interactive Tutor -Student Edition Audio Program -DVD Program and Interactive Tutor -Incorporate electronic graphic organizers. Students label vocabulary for reviewing, re-teaching, and providing additional practice and enrichment. -E-quizzes of Vocab 1 & 2 administered for assessment of mastery before progressing to subsequent lessons. -Teachers will use voice over to sound out words for pronunciation and non-standard syntax to achieve a lyrical, rhythmic, rhetoric or questioning effect. -Using Google translator students will have access for quick reference to understanding colloquial languages. -Teachers will upload videos/pod casts for continuous or repetitive play & retrieval of recall.

Table 3 (Continued)

Interpretive Mode of Communication Learner Benchmark	Learner Indicator Performance Indicator	Implemented Learning Targets (Use actual unit test contents) French Level 3	Activity	Technology	Adaptive Element (How does the teacher make students more efficient in their learning?
NM.IL.2 I can recognize and sometimes understand basic information in words and phrases that I have memorized.	I can ask about plans.	Tier 1: Ex. 2 Learners will listen to a conversation between two or more individuals and answer relative questions. Tiers 2 & 3 Learners will use expressions to ask each other what their plans are. Learners will take turns extending invitations and accepting or declining them.	Google Docs	An electronic copy of the script will be provided to increase students' ability to process the conversation and respond to comprehension questions regarding the content. Per the benchmark lower tier students will be paired with each other.	NM.IL.2 I can recognize and sometimes understand basic information in words and phrases that I have memorized.
	NM.IL.3 I can recognize and sometimes understand words and phrases that I have learned for specific purposes.	I can use regular verbs in the present tense. I can use irregular verbs in the present tense.	Tiers 1,2, & 3: (Ex. 7) Learners will discuss whether or not they like certain activities and propose completing an activity. They are to decide if they will or will not complete the activity. (Ex. 8) Students will complete each phrase with the appropriate verb, (Ex. 9) Students will catch tail end of a conversation taking place in the school cafeteria and will have to select correct form of verb to complete the conversation.	Conjuguemos.com	Teacher will incorporate graphic organizer for completion of verb chart. Using the SmartBoard, teacher will set up *discrimination drills* for extended practice. Using the online software <conjuguemos.com> teacher will set up student accounts for practice of conjugating verbs in context.

Table 3 (Continued)

Interpretive Mode of Communication Learner Benchmark	Learner Indicator Performance Indicator	Implemented Learning Targets (Use actual unit test contents) French Level 3	Activity	Technology	Adaptive Element (How does the teacher make students more efficient in their learning?
NM.IR.1 I can understand learned or memorized words and phrases when I read.	NM.IR.1 I can recognize words and phrases and characters with the help of visuals.	I can retell highlights from a culturally authentic story that includes physical characteristics and personality traits. I can summarize a novice-level article that includes age, physical characteristics and personality traits.	Tier 1: Students will narrate a special day in their lives using the first person. Tiers 2 & 3 Students will create a conversation between two characters based on information provided from a previous story. They will perform the conversation for the class using facial expressions and gestures to emphasize their statements. Tier 1, 2, & 3 Learner will read "Un Papillon dans la cité." Following, they will answer questions stating true or false facts.	Audiobooks Storyboards Internet – International Children's Digital iLibrary http://en.childrenslibrary.org/ .	Intervention will include but not be limited to review/re-teaching using one of the following. -Vocabulary: Teaching transparencies, media guides, DVD programs -Grammar: Internet based activities and games. -Reading: Interactive Tutor Play audio CD versions of the story, one section at a time, stopping at intervals, prior to students reading out loud. -Provide reading strategies. Learners create mental images while drawing pictures with words. -Present video of relative scenes depicting the story. -Allows reflection following reading. -Use clickers for students' choice between true and false. -Set up alternative reading options.. online articles and Bien Dit! Websites. -Internet sites: Antonin se présente Je m'appelle Albame Je m'appelle Véronique ... Personal Descriptions Text Personal Characteristics Vocab Slide

Table 3 (Continued)

Interpretive Mode of Communication Learner Benchmark	Learner Indicator Performance Indicator	Implemented Learning Targets (Use actual unit test contents) French Level 3	Activity	Technology	Adaptive Element (How does the teacher make students more efficient in their learning?
	NM.IR.2 I can recognize words, phrases, and characters when I associate them with things I already know.	I can read a conversation and select the best completion to each sentence. I can read a conversation between two or more people and decide the most logical completion of each sentence.	Tiers 1, 2, & 3 Learners will use a graphic organizer to take notes about the personalities, physical characteristics, and activities of the characters of a story as they listen to the tape or clip. Students will conjugate verbs in past tense.	Internet Webquest Google Draw	Teacher will incorporate Internet/ virtual photos allowing students to experience the actual visitation of the place, which they are reading about. E-quizzes of Grammar 1 & 2 will be administered to assess mastery prior to progressing to subsequent lessons. Intervention will include but not be limited to review/reteaching using one of the following. -Vocabulary: Teaching transparent-cies, media guide, DVD programs -Grammar: Internet base activities and games. -Reading: Interactive Tutor

Data Collection

The data for this study included responses to a short preliminary survey, and the pre-test and post-test scores. The preliminary survey containing both open-ended and closed-ended questions was administered before the collection of any data to gather information on students' prior learning experience with the language and online technology.

Both pre and post-tests were representative of the actual skills/concepts learned (SCDOE, 2015). The pre-test and post-test contained questions that assessed the learning targets based on the SCDOE standards and driven by the Interpretive Listening (IL) and Interpretive Reading (IR) competencies. Similarly, both the pre-test and post-test contained questions using adaptive learning platform strategies: 1) matching, 2) multiple-choice, 3) fill in the blanks, and 4) open-ended questions. However, the enumeration of each exam question was different on each instrument. I designed and administered both instruments. These instruments addressed the tiers through the adaptive learning platform features. Using technology, adaptive learning platforms with adaptive contents provided feedback and encouraged students to continue to perform the exercises (Forsyth, Birch, Deel, & Brauer, 2016). The exercises ranged from easy to difficult, allowing the student to progress through the assessment questions (Forsyth et al., 2016).

Pre-test. The pre-test scores were a students' initial assessment score of his/her prior learning experience and was the same test used for the post-evaluation. Prior learning experience was denoted as Beginner French for those students who had completed French Level 1 and Level 2. Level I would have been studied in two formats: a) part I of French Level 1, namely French Level 1A, would have been studied in 7th

grade and part II, namely French Level 1B in 8th grade; or b) a full year course studied at the high school. French Level 2 would have been completed as a full-year course. Upon entering high school, French Level 3 should comprise of novice-mid learners who have completed French Levels 1 and 2. Based on the results of the pre-test, I determined whether students' initial language abilities were the same in the two instructional modalities or in which modality students were more or less likely to have pre-existing language skills. Students' results on the pre-test were important for determining the level of the population at the start of the nine weeks and for differentiating the instruction to meet learners' needs. The range of possible scores was 0-100.

Post-test. The post-test was administered following nine weeks of instruction as dictated by the SCDOE assessment protocol. The post-test was identical to the pre-test in terms of format and contents, although the questions may have been in a different order. In this study, the assessments were taken approximately 90 minutes to complete, and questions could not be repeated. The test was not timed. If one was answering a question, and supposing one question was answered within 2 minutes, the remaining time did not earn the student any additional time on a more difficult question. The range of possible scores was 0-100.

Quantitative Data Analysis

Upon completion of the study, following nine weeks of instruction using technology platforms including Bien Dit! and Google Apps, during the analyses, this study looked for changes in outcome by comparing the results of students' post-test scores to their pre-test scores. The difference between the pre-test and post-test scores was obtained to see if there was a change, which would define the learning outcomes.

These learning outcomes were compared to distinguish students who have either progressed or regressed to the three-tier categories based on their post-test scores.

After I obtained the students' pre-test and post-test scores and then used a paired Wilcoxon Signed Ranks Test to see whether there was a statistically significant difference between the post-test scores and the pre-test scores. If the change was significant and positive, this would suggest that ALE may have played a role in increasing students' interpretive listening and reading outcomes, at their respective levels, in a face-to-face classroom.

Validity Threats

This section addresses the validity threats I anticipated as I designed this study. Validity threats that emerged during the research are discussed in Chapter 4. Since this research is not designed to be statistically generalizable, I do not discuss external validity threats. The internal validity threat is the degree to which alternative explanations for the obtained results cannot be ruled out (Tashakkori & Teddlie, 2009). This study presented four internal validity threats: 1) Participants' attributes were different from another before the study started (Tashakkori & Teddlie, 2009). Therefore, the changes after treatment were not solely attributable to the independent/criterion variable. 2) Differences between the pre-test and the post-test might have been a result of familiarity with the test (carry-over-effect) rather than differences in the independent variable (Tashakkori & Teddlie, 2009). 3) Inconsistent attendance could have influenced the findings because they were not sufficiently exposed to the instructional materials and experienced ALE. Consequently, their performance on the post-test would not be indicative of the intervention. Students' post-test scores may have been influenced by their comfort with

technology, which was dependent upon the students' access to technology and the Internet. 4) Finally, the inability to validate the pre and post-tests and ensure they were testing the same constructs at the same level introduced an element of uncertainty to the study. As the instructor, I used my 18 years of experience and applied South Carolina standards to guide the development of the tests in order to minimize any differences

Interpretation issue. In addition to the aforementioned validity threats, there was also the possibility that students who were already fluent in the target language had selected to study a low- level course to earn an "easy A". Greenville, S.C. has a small population of native French speakers. Moreover, there exists a French immersion elementary school that feeds students to middle and high schools. Therefore, the findings may have been skewed. To identify native French speakers, a short open-ended survey was administered to students who were already bi-lingual. As a result, no student had indicated that they spoke French. Therefore, any changes among linguistic skills were insignificant for this study.

Ethical Considerations

In addition to having been a researcher, I was also teaching face-to-face courses as well as monitoring the implementation of the online instructional modalities. Moreover, as an instructor who is a polyglot, I believed that I could recognize and synthesize the process of language acquisition to ensure the efficacy of the instruments being used in the study. It was also expected that the participants of the study had varied levels of experience with the methodologies employed, which were not necessarily known to the researcher.

As the researcher, to ensure the ethical compliance of the research site, the approval of the Greenville County School District Superintendent had to be obtained, as well as that of the school Principal in order to conduct the study. An Instructional Coach, also an administrator, provided clarification and an understanding of the acceptable use policies with regards to the Internet and the use of Chrome books. Moreover, I met with the administrators so that I did not misrepresent the institution and its services to the students. I met with the world language faculty at the research site to review and discuss their curriculum; lessons plan and explored practical strategies for obtaining the most accurate data. The researcher's role further entailed compiling the data, analyzing the data, and drawing a conclusion in support of the study. Having been a second-language learner and having taught world language for over fifteen years, my experience and knowledge also guided this study. In the instance of determining the skill categories of the different activities, I analyzed each activity and determined whether they fell under the categories of reading, writing, listening, or speaking.

Conclusion

World language courses were required for college-bound students. This research could serve as a testimony to the efficacy of ALEs for addressing the cognitive challenges among students. In terms of grades, social pressure is more likely to encourage faculty to give students a passing grade especially when other researchers had found that students using online technology tend to perform poorer in comparison to traditional face-to-face instruction.

Do all online platforms provide the necessary tools for completing the key activities that lead to success? There remain several other areas to be explored.

Additional readings on the cognitive styles of learners versus the learning styles as defined by Rayner and Riding (1997), require special attention, particularly when determining which activities would be best suited for various levels of competencies. Adaptive learning is implemented in classrooms with computer algorithms to decide what the students ought to be presented with next. Although this study did not explicitly address differentiated instruction- a manual strategy commonly used in K-12- one cannot dismiss its popularity. Therefore, there was no reason to doubt that adaptive learning, as a form of differentiated instruction, would work.

Chapter 4

Findings

Chapter 4 presents the findings from having studied ALEs when using technology to support high school students studying languages as novice-mid learners. Two research questions drove this study: 1) What are the interpretive listening and interpretive reading skills of novice-mid language learners in a technology-supported adaptive learning environment? 2) What changes are observed in the interpretive listening and interpretive reading skills of novice-mid language learners, by target group, in a technology-supported adaptive learning online environment? Throughout this chapter and the next, Interpretive Listening and Interpretive Reading pre-tests and post-tests are periodically be referred to as I.L. pre-test and post-test and I.R. pre-test and post-test respectively.

To conduct this study, I employed a quantitative design using data on pre and post-test scores. The former was gathered from a traditional classroom, and the latter from an ALE using online technology platforms. The data derived from the instructional student assessment outcomes. Students' results on the pre-test served as their baseline score, and their target growth was projected as mandated by SCDOE (2015). The study was limited to nine weeks of online instruction preceded by a preliminary survey consisting of 11 open-ended and closed-ended questions to understand better students' World Language learning experience.

As the researcher, I administered a pre-test to the students to establish their baseline for placement in low, average, or high-performing tiers (SCDOE, 2015). I then determined the mode of communication which students should develop and define each

Tier's learner target (Table 3). Over the course of nine weeks, all adaptive elements listed in Table 3, identified as being conducive to learning, were used to create the ALE as an intervention for improving learner experience and to make progress, which was measured periodically (Wang & Lindvall, 1984). To differentiate the instruction and to meet students where they were, I integrated the technology platform, Classcraft (Figure 1) below, to modify their instruction. (Tomlinson & Strickland, 2005).

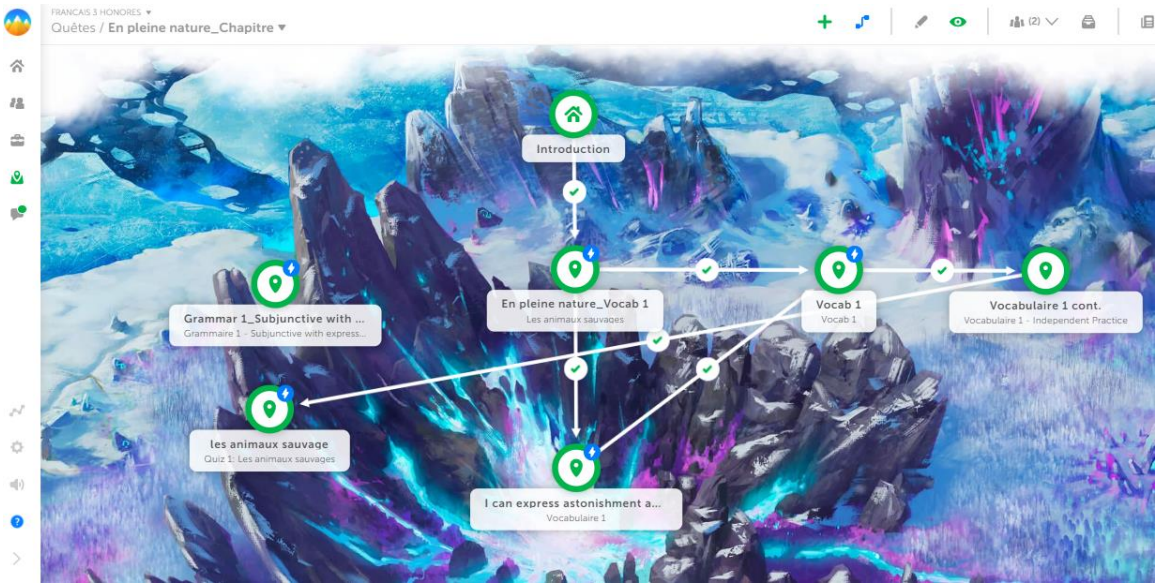
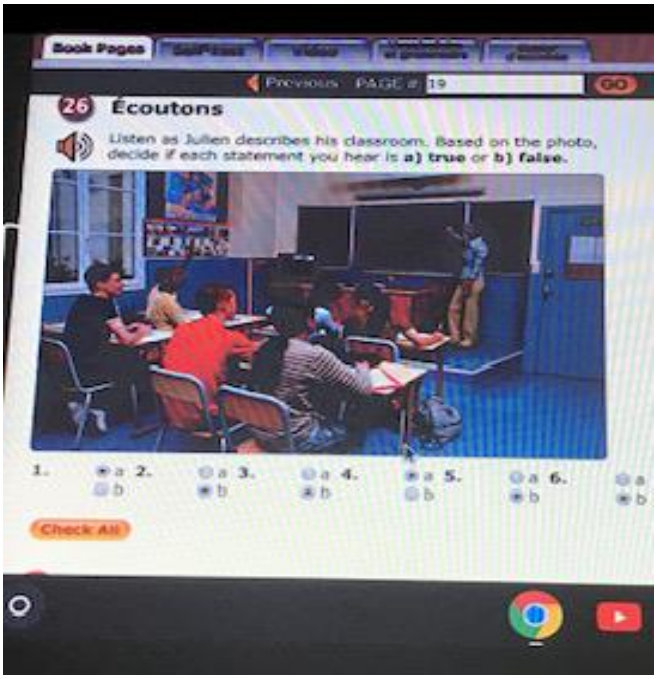


Figure 1. Classcraft

Using ALE, I revealed the influence of online learning, by comparing students' pre and post test scores. As listed in Table 3 above, for example, the learner target, such as *expressing likes and dislikes*, was manipulated to meet the participant's initial proficiency level (Wang & Lindvall, 1984).

Consequently, implementation of the ALE involved using one of the following 1) Vocabulary: Teaching transparencies, media guides, DVD programs, 2) Grammar:

Internet base activities and games, (Figure 2), 3) Reading: Interactive Tutor. ALE allowed for periodic evaluation of self-responsibility for diagnosing students' current needs and abilities (Wang & Lindvall, 1984).



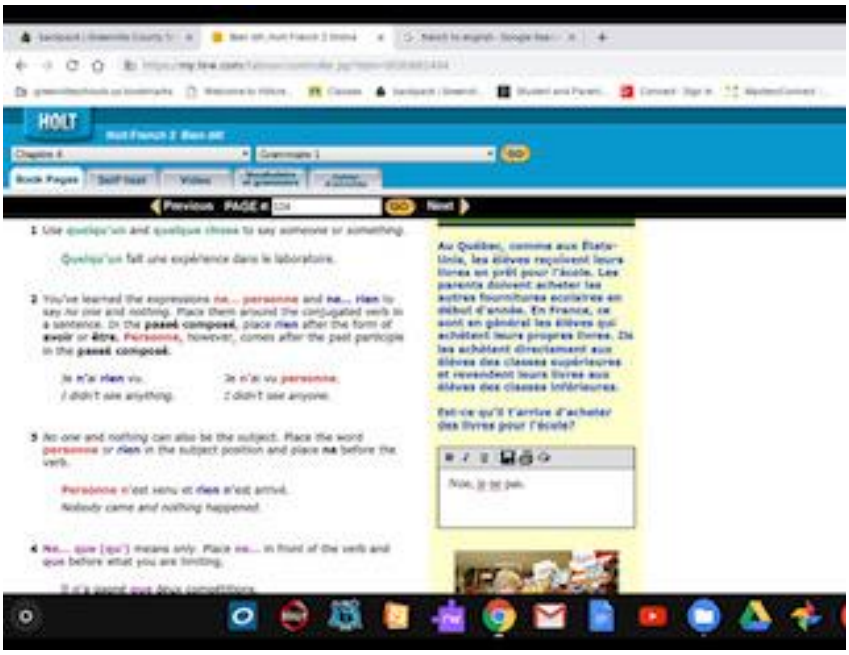


Figure 2. Interpretive Mode Interactive Activities

This platform gave the students the opportunity to evaluate mastery (Wang & Lindvall, 1984) by affording them with alternative learning activities and materials for aiding their acquisition of academic skills and content (Wang & Lindvall, 1984). Moreover, Google classroom and Google Hangout of the Google Suite platform (Figure 3) allowed for the placement of students in breakout sessions so they could work in collaboration (Wang & Lindvall, 1984).

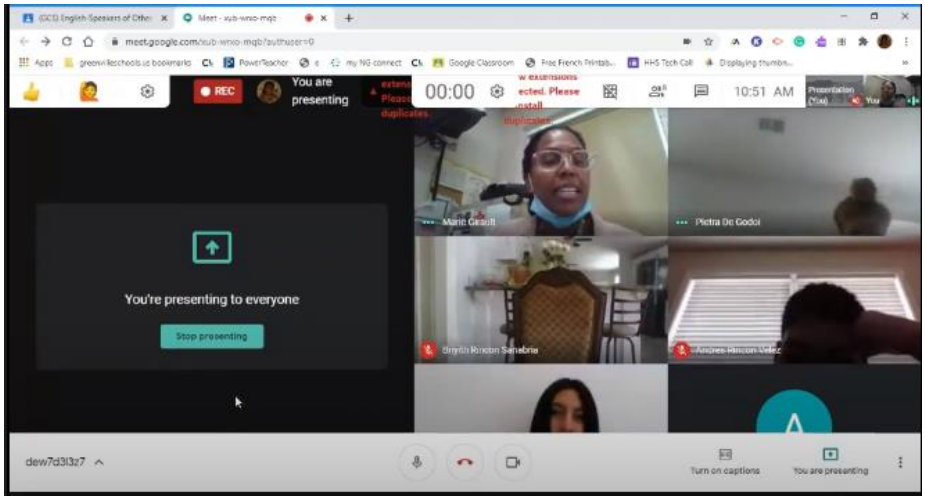


Figure 3. Google Suite Implemented

The inaccessibility to WiFi and malfunctioning Chrome books as students were abruptly and unexpectedly mandated to work from home during a pandemic made it difficult for students to complete their assignments or delayed the submission of their assignments prolonging the length of time reserved for the study, which was nine weeks. Following the intervention, I administered a post-test and analyzed the results for comparison.

The Sample

I had anticipated approximately 50 students to participate; however, only 37 (n=37) obtained parental consent. Of the respondents, 15 (41%) were at the upper-tier representing French 3 Honors and College Prep students, 15 (41%) from French 3 Honors and College Prep combined represented the mid-tier, and 7 (18%) represented the lower tier also deriving from both Honors and College Prep courses (Table 4).

Table 4

Distribution of Students in Growth Tiers

Students	n	Percent
Upper-tier	15	41.0%
Mid-tier	15	41.0%
Low-tier	7	18.0%

Amongst these Honors and College Prep students, 35 of 37 students completed the survey. Furthermore, 11 students did not take the post-test and had to be eliminated

from the analysis reducing the sample size to 26. After following up on the non-remittances, the overall response rate was 94%. However, during the study, this total was reduced to 70%, eliminating those students who did not complete the post-test.

Demographic data. The study sample consisted of 15 male and 22 female students. Table 5 illustrates that amongst these two groups, there were three-Asian students, two students who were of two or more races, six students who were Hispanic/Latino, and students who were Black/African Americans, and 24 students who were White; 25% spoke a second language. They also ranged from grades 10-12 and were 15-17 years old.

Table 5

Demographics

Student I.D.	Ethnicity	Gender	Grade Level	Speak a Second Language
1	Asian	M	11	Yes
2	Two or More races	F	11	No
3	White	F	10	No
4	White	F	11	No
5	White	F	11	No
6	White	F	11	No
7	Asian	F	10	Yes
8	African American	F	12	No
9	African American	M	12	No
10	Hispanic	F	11	Yes
11	Hispanic	F	11	Yes
12	Hispanic	F	12	Yes
13	Hispanic	F	12	Yes
14	Hispanic	M	10	Yes
15	White	F	10	No
16	White	F	10	No
17	White	F	10	No
18	White	F	10	No
19	White	F	11	No
20	White	F	11	No
21	White	F	11	No
22	White	F	11	No
23	White	M	10	No
24	White	M	10	No
25	White	M	10	No
26	White	M	12	No

Survey Responses

This study focused on understanding ALEs while employing technology in world language classes. To accomplish this, one had to understand the students' experience with online learning and access to technology and WiFi. Therefore, I administered a combined quantitative and qualitative survey consisting of 11 questions (See Appendix B). These questions allowed students to give their personal opinions about online learning.

As noted in Table 6 students' experiences with online courses ran from 1) none (*n*=6, 17.14%), 2) little to none (*n*=19, 54.29%), 3) some (*n*=7, 20%), and 4) a lot (*n*=3, 8.57%). Although 94.29% of respondents revealed that they have access to Broadband and Internet service, most of the students (*n*=25, 71.00%), as evidenced by the survey responses, had minimal experience with online learning. Before participating in this study, 83% of the students had studied the target language for three years or less, and only 6 or 17.14% had studied the language for four or more years.

Table 6

Students' survey responses

Respondents	n	Percent
Online Experience		
None	6	17.1%
Little to none	19	54.3%
Some	7	20.0%
A lot	3	8.6%
Access to a computer at home?		
Yes	34	97.1%
No	1	2.9%
Access to the Internet at home?		
Yes	33	94.3%
No	2	5.7%
Do you speak a second or third language at home?		
Yes	10	27%
No	27	77.1%
Did you use technology in previous language classes?		
Yes	29	82.9%
No	8	17.1
What experience do you have with learning a language?		
High School	16	43%
What factors of an online course are most important for you?		
Communication With teachers and peers	13	35%
What apps help you with school assignments in language class?		
Google Translate	7	19.0%
How long have you studied the language?		
3 years	35	94.0%

In terms of being bilingual, Table 6 illustrates that 27 of 37 students (73 %) said they did not speak a second language and 35 (94%) said they had studied the target language for at least three years before participating in the study. The survey also revealed students' experience with technology; 29 (82%) participants had used Google Suite before the study, with 16 (43%) having done so mainly upon entering high school.

To further understand students' preferences for either traditional or online instruction, each answer choice was counted and tallied. Once aggregated, students' preference for instructional methods could be deduced (Table 6). I posed three questions in the survey to understand students' preference for online learning (Table 6). The survey indicated that 37.24% of the respondents preferred traditional classroom instruction, 13 (35%) felt that communication and face-to-face interaction were essential, and 7 (19%) utilized the assistance of Google Translate. This figure is relevant because online translators are usually forbidden in traditional and online language instructional classrooms. Allowing online translators facilitates understanding of vocabulary and idiomatic expressions, supporting students' preference for learning.

Survey questions. I posed two closed-ended questions to understand students' accessibility to online learning: 1) Do you have access to a computer at home; 34.7 (94%) said yes. 2) Do you have access to the Internet at home; 32.93 (89%) said yes. These questions were essential to ensure that students' participation in the study was probable and promptly understood the likelihood of completing their assignments. Moreover, these closed-ended questions presented discrete sets of responses that were easily quantified, (Creswell, 2005) and aggregated into two thematic categories.

***Theme I. Comprehensibility of lesson delivery*.** The open-ended survey data's primary theme was the online platform's influence on student comprehension. This theme emerged from 7 students' comments, out of 37, describing the students' online lesson delivery's comprehensibility. The assignment was composed of a dialogue in the target language - French. The following seven direct quotes were selected as a subset of the entire sample and demonstrated that students understood the lesson objective; the other 30 students did not comment. In terms of the difficulty of the online assignment, one student said it was "Simple and easy (Student 7)", and another said, "It's useful in many situations (Student 8)". When asked what the video was about, several students said the following: 1) "The video is teaching me about 'basic' French (Student 1)". 2) "They are teaching you proper ways to be polite (Student 5)". 3) "It's common phrases" (Student 13)". 4) "It is teaching us basic manners in French (Student 20)". 5) "The video is teaching me about basic questions and statements in French to use (Student 18).

After viewing the lesson, 16 or 45.71% of the students indicated that they could comment on the lesson's goal. Students' commentaries also support this theme, evidencing students' comprehension of the online modality. Students shared their most common opinion of the lesson, demonstrating they understood online learning as much as traditional classroom instruction. Hence, the more comprehensible online learning is, the higher the probability that student-learning outcomes will yield a more significant outcome.

Theme II. Willingness to learn online. The second theme that emerged from the analyzed data of the open-ended questions is students' willingness to learn online. This theme reflected 20 coded responses out of 37. The first typical response referred to the

ease of learning. Students stated, "Technology makes it easier to learn things as you can look up how to do almost anything (Student 18)". "It is different but easier to learn for me (Student 14)". The second most frequent response revealed how cooperative they were towards eLearning. Students used terms such as "Nice (Student 9)" and expressions such as "It would be a great tool to use (Student 5), and "It would be nice and helpful (Student 19)". Finally, students collectively expressed how they felt about learning online. "I feel like it could work for me (Student 1)". "It would be a welcome change (Students 23), "It could be more influential (Student 3), and "Hopeful that it's efficient (Student 26)".

Descriptive Statistics

Below, I separately present and discuss the descriptive statistics for the participants' reading and listening scores in Table 7. The possible range of scores for the I.L., and I.R. pre- and post-tests was 0 to 100.

I.L. scores. The mean for Interpretive Listening pre-test scores was higher than the mean for the post-test scores. The pre-test score had a minimum of 38 and a maximum of 100. The pre-test and post-test scores were 90% and 60.9%, respectively (Table 7). The average of the difference of the Interpretive Listening scores was -30%.

I.R. scores. The mean for Interpretive Reading pre-test scores was higher than the mean for the post-test scores. The pre-test score had a minimum of 40 and a maximum of 100. The pre-test scores and post-test scores were 72.5% and 58.7%, respectively (See Table 7). The post-test is lower than the pre-test. Consequently, the direction of the difference reveals that the intervention, an ALE, did not aid in increasing students' outcomes as measured by the post-test when compared to as measured by the pre-test. The average of the difference of the Interpretive Reading was -14% (Appendix D). As a

result, I discovered 17 cases where the Post-test was lower than the Pre-test scores and 9 cases where the post-test scores were higher than pre-tests. In other words, only 9 cases reflect the improvement of Interpretive Reading skills following the intervention.

There was a higher percentage change amongst the Interpretive Listening (-33%)scores than the Interpretive Reading (-19%).

Table 7

Descriptive Statistics

Instrument	n	Mean	Std. Deviation	Min	Max
2018-2019 Interpretive Reading (Pre-test) %	26	72.5	14.4	40.00	100.00
2019-2020 Interpretive Reading (Post-test) %	26	58.7	25.5	.00	87.00
2018-2019 Interpretive Listening (Pre-test)	26	90.6	13.2	38.00	100.00
2019-2020 Interpretive Listening (Post-test) % Points	26	60.9	21.9	.00	87.00

Wilcoxon Signed Ranks Test Analysis

The null hypothesis states that there is no difference between students' pre and post-test scores. Students who did not take the post-test were eliminated from the analysis to conduct an equal two-tale paired test (see Appendix C).

Result of interpretive listening test. The results of the two-tailed Wilcoxon signed-rank test were significant based on an alpha value of0.05, V = 349.00, Z = -4.41, $p < .001$. This result indicates that the differences between IL_Pre-test and IL_Post-test are not likely due to random variation. The median of IL_Pre-test (Mdn = 0.88) was significantly higher than the median of IL_Post-test (Mdn = 0.65). Figure 4 presents a boxplot of the ranked values of IL_Pre-test and IL_Post-test. Therefore, we must reject the hypothesis and accept that there is a difference between the pre-test scores and the post-test scores.

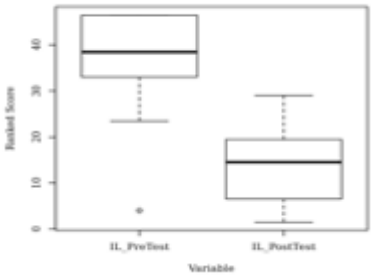


Figure 4. Ranked values of I.L. Pre-test and IL Post-test.

Result of interpretive reading test. A two-tailed Wilcoxon signed rank test was also conducted to examine whether there was a significant difference between IR_Pre-test and IR_Post-test. The results of the two-tailed Wilcoxon signed rank test were significant

based on an alpha value of 0.05,$V = 262.00$, $z = -2.20$, $p = .028$. This result indicates that the differences between IR_Pre-test and IR_Post-test are not likely due to random variation. The median of the IR_Pre-test (Mdn = 0.72) was significantly higher than the median of the IR_Post-test (Mdn = 0.68). Figure 5 presents a boxplot of the ranked values of the IR_Pre-test and IR_Post-test. Therefore, we must reject the null hypothesis that there is no difference between the pre- and post-test.

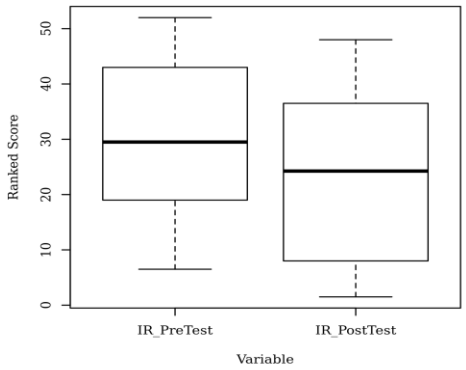


Figure 5. Ranked values of IR_PreTest and IR_PostTest

Spearman Correlation Analysis

I conducted a Spearman correlation analysis between the Pre-test results and the Post-test results. I used Cohen's standard to evaluate the strength of the relationship. There is a small correlation between the pre and post-test scores for both the I.L. scores and the I.R. scores. It is reasonable to expect a moderate to the strong relationship between pre-and post-test scores; however, this was not the case in this study. Substantively, this would not usually make sense, but because this study captures factors that influence the difference between the pre and post-test, the weak correlation suggests other stronger influences on the post-test scores than the pre-test scores.

Interpretive listening test statistics. The Spearman Correlation Analysis revealed no significant correlation between the Interpretive Listening pre-test and post-test results given a small effect size (*r*s = 0.19). As a result of this relationship, I suggest that the pandemic factors had to have influenced students' performance on the post-test. Figure 6 presents the scatterplot of the correlation. A regression line has been added to assist the interpretation.

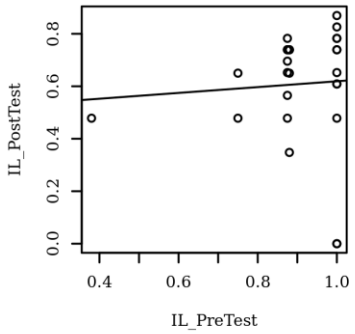


Figure 6. Scatterplot between the Interpretive Listening pre-test and post-test scores with the regression line added

Interpretive reading test statistics. The Spearman Correlation Analysis revealed no significant correlation between the Interpretive Reading pre-test and post-test results given a minimal effect size (*r*s = 0.20). Figure 7 presents the scatterplot of the correlation. A regression line has been added to assist the interpretation.

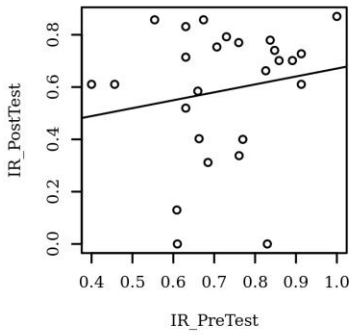


Figure 7. Scatterplot between Interpretive Reading pre and post test scores with the regression line added

Analysis by Targeted Growth Tiers

Before the intervention, I had administered a pre-test to the students to establish their baseline for placement in a low, average, or high-performing tiers. The target tiers represented students' level of performance before the intervention. Following the intervention, four Low-tier students moved up to the Mid-tier (See Table 8). Five Low-tier students remained in the Low-tier, and no students moved up to the Upper-tier (See Table 8). Before the intervention of an adaptive learning platform, three students in the Mid-tier group dropped down to the Low-tier, and one remained in the Mid-tier. No one from the Mid-tier moved to the Upper-tier. Among those in the Upper-Tier, eight dropped down to the Lower-tier, four dropped to the Mid-tier, and one student remained in the Upper-tier.

Table 8

Cross-tabulation of Growth Tiers

Pre-intervention tier	Post-intervention tier		
	Low-tier	Mid-tier	Upper-tier
Low-tier	5	4	0
Mid-tier	3	1	0
Upper-tier	8	4	1

Substantive Conclusion

The percentage change amongst the Interpretive Listening (-33%) scores is greater than the Interpretive Reading (-19%), but negative in both cases meaning that there was no improvement in the test scores following the intervention. In fact, the students regressed. Consequently, overall, students did not make much progress following the intervention. Only four students made progress as evidenced by their movement from the Low-tier to the Mid-tier.

Chapter 5

Conclusion, Implication of Findings, and Recommendations

As schools grapple with the challenge of offering world language classes to students of varying abilities, this study sought to contribute to our understanding of the outcomes of technology-supported, ALEs, as the interest in using various technology platforms to increase student engagement continues to grow. While employing a postpositivist framework, this study focused on the overarching theme of adaptive learning as it explored the influence of adaptive learning with technology in language education and if it created a difference in the outcomes of online instruction (Lamport & Hill, 2012; Yang et al., 2013). I posed two questions in this study.

Research Questions

Research question 1. What were the interpretive listening and interpretive reading skills of novice-mid language learners in a technology-supported ALE

Research question 1 answered (I.L). The mean for Interpretive Listening pre-test scores was higher than the mean for the post-test scores. The pre-test scores ranged from 38 to 100 and the post-test scores ranged from 00 to 87. The pre-test and post-test results were 90% and 60.9%, (Table 6). The average of the difference of the Interpretive Listening scores was -30%. Listening results showed a significant difference in the mean grade for the pre and post-tests at a=.05 level (Z= -4.41b, p= .000).

Research question 1 answered (I.R). The mean for Interpretive Reading pre-test scores was higher than the mean for the post-test scores. The pre-test score ranged from 40% to 100%. The pre-test scores and post-test scores were 72.5% and 58.7%,

respectively (See Table 6). On average, the post-test results were lower than the pre-test results. The average of the difference of the Interpretive Reading scores was -14%. I discovered 17 cases where the Post-test was lower than the Pre-test scores, and 9 cases where the post-test scores were higher than pre-tests (Appendix D). There was a statistically significant difference in the interpretive reading scores between the pre- and post-test at a=.05 level (Z= -2.19b, p = 0.029). Based on their starting point and following the intervention, one student had increased his/her French language proficiency (Table 7).

Research question 2. What changes were observed in the interpretive listening and interpretive reading skills of novice-mid language learners, by target group, in a technology-supported adaptive learning online environment?

Research question 2 answered. The changes observed in the interpretive listening and interpretive reading of novice-mid language learners, by target group, in a technology-supported adaptive learning online environment are: five students in the Lower-tier remained in the Lower-tier, four moved to the Mid-tier, and zero made it to the Upper-tier. Among those in the Mid-tier, three dropped to the Lower-tier, one remained, and zero moved to the Upper-tier. Amongst those who began in the Upper-tier before the intervention, one remained in the Upper-tier, four dropped down to the Mid-tier, and eight dropped to the Lower-tier. In other words, 19% of the students remained in the same tier as before the intervention. The most considerable change was that of the upper-tier, 62% dropped to the Lower-tier, suggesting that other factors interfered with students' performance on the post-test and still needed to be explored.

Implications of Findings

After conducting the study, the overall findings revealed that students, in general, performed worse at the end of the intervention than they did at the beginning. Consequently, as the researcher, I had to consider possible explanations. Under the 21st-century initiative, students must be able to address global intellectual and technology competency; however, many factors interfered with this initiative and students' ability to perform in the ALE.

At the start of this study, South Carolina was mandated to teach and learn remotely due to a corona virus pandemic (GCS, 2020). This decision came suddenly and abruptly disturbing public education, displacing students and their families from a structured in-school environment to an at-home online learning environment, a concept relatively new to many. Addressing the pandemic, educators known as Academic Specialists were employed to develop foundational eLearning lesson plans for all disciplines so teachers would not have to write new lesson plans for their virtual classes. The new lesson plans for the virtual classrooms were expedited, made customizable by teachers and served as a starting point for teaching their subject matters. These new lesson plans did not influence this study because I continued to deliver the same plans as originally intended for this study. I was able to do this because I had already incorporated technology and the use of students' Chrome books within an ALE similar to the newly designed plans for eLearning. I asked students to utilize their Chromebook to learn online. They were faced with many challenges, such as prior learning experience and the lack of access to technology resources that impeded students' ability to address fluency.

Alignment of standards, instruction, and assessment. The alignment of standards, learning targets, and assessments are critical for a coherent curriculum. Taking the curriculum online should not change the framework of actual learning. In other words, the written and taught curriculum should reflect the concepts and skills required in the standards. As per the South Carolina World Language Proficiency Standards (SCDOE, 2013), every learner will engage in meaningful, intercultural communication; understand and interpret spoken and written language; and present information, concepts, and ideas in local and global communities. During the intervention, I created these communities using Google Hangout and Google Meet, allowing students to enter into virtual breakout rooms and engage in meaningful conversations. Topics of discussion were based on the learning targets dictated by the "Can do" statements for each competency assessed.

ICT as support for teaching and learning. This study focused on applying Information and Communication Technology (ICT) with platforms that offer methodologies that support teaching and learning (Hill, 2010). During the Pandemic, and due to budgetary constraints, the GCS district could not have implemented a district-wide adaptive platform. Therefore, utilizing Google integrated Apps, Classcraft, as well as Bien Dit! Online Learning (DeMado, Champeny, Ponterio, Ponterio, 2008) was a solution comparable to those found in classrooms nationally approximating an ALE. Despite having to relocate as the school district mandated because of the pandemic, the study continued seamlessly as students continued to work using their Chrome books and assigned technology platforms while completing all of the assignments during those nine weeks. Although the results of the study demonstrated that the students did not learn

despite having completed all of the assignments; at the very least, for nine weeks, this research demonstrated that online learning is sustainable, while employing an adaptive learning platform, coupled with teacher facilitation.

It is unclear what role ALE played in students' performance in this study. Given the fact there was a pandemic going on, there is reason to believe that the pandemic contributed to students' weaker scores at the end of the semester. Although ALE did not yield higher results than face-to-face instruction, given the data, it is possible that student outcomes could have been worse if I had not already implemented an ALE before the pandemic.

To conduct this study, I took into consideration seven characteristics of ALE theory introduced by field experts such as Waxman et al., (1985) to identify an ALE where appropriate data is generated to analyze student learning outcomes. Waxman et al. (1985) discovered that "the effect appeared constant across grades, socioeconomic levels, races, private and public schools, and community types (p.1)". The effects were also constant across the categories of adaptiveness, social contexts, and methodological rigor (Waxman et al., 1985).

Designing a culture assessment. Assessments are based on gathering information about students' performance and demonstrating "accumulated proficiency" of the lesson goals and objectives. Grades draw upon the assessment data and are usually the result of students' performance (Delmont, 2016). During the Pandemic, many students were more than inconvenienced. They were frightened, traumatized, and devastated to economic, mental, and physical health. Consequently, giving students the benefit of the

doubt had never been more critical. However, I had to consider the child/family (I.E., Homeless, does not speak English).

ALE platforms set the criteria for unconventional assessments within the scope of online learning instruction. Online learning affords students opportunities for self-directed learning, allowing for modification of activities to suit their learning needs based on their interest. It can be manipulated to meet the student's initial proficiency level and work at his or her own pace (Wang & Lindvall, 1984). Activities may be repeated, and time extended, as weaknesses are identified (Forsyth et al., 2016). As adapted learning platforms dictate, the ability to modify, reinforce by repetition, and extend time all lend themselves to increase student outcomes (Yang et al., 2013). Assignments were adjusted to maximize learning and inform the outcomes. This study used the Bien Dit! and Google Apps to create this adaptive assessment. Irrespective of the learning methodology employed, the same rigorous curriculum was applied, and state standards were respected (SCDOE, 2015).

Students' perception of online learning. This study revealed that many students found online learning quite simple despite the Pandemic and unexpected learning modality changes. As one student shared, "Technology makes it easier to learn things as you can look up how to do almost anything (Student 18)". Another student stated, "It's different but easier to learn for me (Student 22) Moreover, when asked about the practice of using the online platform, one student noted, "It is useful in many situations (Student 8)". These statements serve as evidence that online learning can be useful. Establishing a useful online platform will encourage student engagement and promote more significant student learning, which will prevent students from losing

interest in world language studies and sustain enrollment in the programs.

Interpretation of result of study. As a result of the findings, one might conclude that ALE harms student outcomes because the post-tests scores were worse than the pre-tests scores. Because there was a pandemic going on, there is reason to suggest that the pandemic contributed to students' weaker scores at the end of the semester. Furthermore, despite the post-test scores being worse than the pre-test scores, the intervention did not overcome all the other issues that were taking place as suggested by the pandemic. Nonetheless, I do not know if ALE is the reason that students did worse; however, without ALE, there is a possibility that the student outcomes could have been a lot worse.

Validity

Within the first two weeks of the study, the district-mandated remote learning due to the Corona Virus pandemic. All students had to revert to remote learning while using Google Chrome books and the Internet. Once working from home, many of these students found themselves without WiFi and immediate assistance with malfunctioning Chrome books. Moreover, locating the students became a challenge since many relocated to shelters and other cities due to their parents being unemployed. These factors widened the gap between language learners and their prior learning experience. They also delayed completing the students' work prolonging the study beyond the nine weeks, allowing data collection one week later. This shift in instruction and the pandemic context created significant construct validity threats for this study that I was unable to mitigate.

Construct validity. The post-test was reflective of World Language Standards and learning outcomes, as was the pre-test. Having both tests reflect the same standards

and outcomes increased the likelihood of the pre-test and post-test measuring the same construct. The post-test addressed interpretive listening (IL) and interpretive reading (IR) competencies through exercises that direct communication within a cultural context (The National Standards Collaborative Board, 2015).

Content validity. During the Pandemic, Greenville County Schools was also very adamant about grading for completion and not for progress. Knowing that they would not be held accountable for giving the right or wrong answers, students were motivated to complete all tasks. However, to verify the alignment, one would have had to compare students' assessment outcomes to see if there was a common area on the assessment where students demonstrated difficulty or failure. Because accuracy was not the virtual classroom's objective, it was difficult to determine if the curriculum's alignment to the standards was accurate. Nonetheless, to level the playing field for all learners in traditional and online learning, aligning the curriculum standards, lesson objectives, and assessments was critical and a more accurate predictor of student achievement than socioeconomic status, gender, race, and teacher effect. Curriculum alignment is important for students' comprehension of lesson objectives and assessment if they are to succeed at the task at hand.

Preparing for virtual teaching. To address an unexpected pandemic and the urgent need to teach online, I had to tap into my study design's nature, which facilitated the transition. In this study, I had developed self- directed activities but still involved the teacher in assisting students to progress through the different levels of the unit contents. I had written out instructions over multiple sections of the platform to do this, scaffolding the interpretive process. Moreover, to address my definition of ALE, a process that

allows for "self-directed modification of online instructional activities based on students' aptitude to increase performance that will promote student *learning outcomes*," I had designed the study to allow for the students to make selections based on their preference for learning (The National Standards Collaborative Board, 2015). Moreover, I varied the materials' presentation by including visuals in support of written instructions (Oliver, K., Kellogg, S., Townsend, L., & Brady, K. (2010).

To address differentiated instruction, I had anticipated students studying virtually; therefore, I had modified assignments so that upper-tier students could either work ahead of the scheduled assignments or select more challenging assignments that yielded greater rewards. These rewards ranged from higher point grades or the opportunity to skip assignments. I allocated extra time to the Lower-tier students to turn in their assignments by maintaining daily, weekly assignments opened in the portal without a due date, giving them time to revisit the assignments as often as needed.

Recommendation for Practice

As a result of the observations during this study, I recommend 1) Consistent communication between teacher and student, either via Google Meet or Hang Out, is essential so students can continue to feel the teacher's presence and uphold the expectation of accountability. This recommendation derives from students' survey responses to the factors they consider an online or hybrid course most important to them. 2) To encourage students to sign into Google platform and complete their assignments, educators should have as many large online platforms for the students to access as technology is rapidly changing that even within a span of two to three weeks, a Youtube video may expire. Teachers may have to allow students to substitute

assignments within the scope of the content being taught.

Recommendations for further research. I conducted **t**his study using a non-experimental quantitative design to examine ALE environments changes while using technology in a World Language online classroom. This study was interrupted by the Corona Virus pandemic. Consequently, Greenville County Schools had to mandate immediate transfer from traditional classrooms to online remote learning without notice to stakeholders and students. Even though my classroom was ready for this transition, students nonetheless were impacted by the broader context of the pandemic and many struggled academically. Because I was not able to capture the effects of ALE, another study should be conducted following the Pandemic when it is possible to study the intended focus, namely the ALE, and its possibilities.

Recommendation for policy and leadership. As SCDOE addresses poverty and prepare students for 21st century industries, I recommend that they offer students the choice of either face-to-face instruction or virtual learning. I also recommend that they consider opening a virtual school allowing for both online and perhaps a hybrid mode of instruction. I also recommend developing a budget and appropriating sufficient funds for emergencies such as the Pandemic.

Conclusion

SCDOE sought out to address Adequate Yearly Progress among a low socio-economic school community that struggles with poverty and limited resources. In light of a COVID-19 pandemic context, it is not surprising that the relationship between pre and post-test was weak. Pre-COVID, instruction was taking place in a traditional classroom. Because of COVID-19, this study took a different turn. COVID-19 threatened the validity

of this study with the absence and disbursement of students and the district's inability to implement a district-wide eLearning curricular platform. This relationship between the pre and post tests suggests that pandemic factors influenced students' performance on the post-test. Nonetheless, employment of distance and virtual modes of instruction, thanks to technology, ensured the continuity of school giving rise to the term "pandemic learning." As a result of this study, which incorporated technology into the lesson plans, the shift to eLearning was quite simple during COVID. On March 9th, the students began preliminary assignments in a brick and mortar classroom using the ALE platform to demonstrate and ensure their adaptability to eLearning. One week later, on March 16th, the students began the required assignments that needed to be completed during the actual study. They worked for four consecutive days. On March 19th, the school district transferred to eLearning. Working from home using an ALE platform, students continued to be engaged throughout their lessons and communication with the teacher did not fall short by any means. ALE made shifting from the traditional classroom instruction to the virtually seamless. Student expectations did not change. The SCDOE and World Readiness standards and learning targets remained the same, assessments were administered as planned; and the timeline for completion of assignments suffered minimal interruption.

This study observed the changes in the interpretive listening and interpretive reading of novice-mid language learners, by target group, in a technology-supported ALE. Contrary to what I had predicted, students on the top tier did not remain in the

upper-tier and many students regressed to the lowest tier.

ALE with the employment of technology facilitated the differentiation of instruction for students to continue learning, during a pandemic, at their own pace. The differentiation of instruction offered the opportunity to explore multi-level instruction allotting ample time for slower learners to excel and advanced learners the opportunity to expedite through the curriculum.

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Appendix A

Rubric

CRITERION	YES	NO	Recommendation/Remediation
"I Can Statements" – Learning Target			
I can read a conversation and select the best completion to each sentence.			
I can read a conversation between two or more people and decide the most logical completion of each sentence.			
I can express likes, dislikes, and preferences.			
I can ask about plans.			
I can use regular verbs in the present tense.			
I can use irregular verbs in the present tense.			
I can retell highlights from a culturally authentic story that includes physical characteristics and personality traits.			
I can summarize a novice-level article that includes age, physical characteristics and personality traits.			
I can read a conversation and select the best completion to each sentence.			
I can read a conversation between two or more people and decide the most logical completion of each sentence.			
(Scaffolding: Selection of technology platform, preferred assignment)			
Is the chosen assignment directly related to the learning target and does it meet the standards (e.g., I Can, SCDOE)?			
Does the completed assignment demonstrate an informed decision by the learner?			
Did the student understand and analyzed his/her errors as a tool for moving onto the next assignment?			
Did the student demonstrate familiarity of the chosen technology platform and had sufficient practice with the technology prior completing the assignment? (e.g., Google Suite, Classcraft, etc.)			
Is the chosen assessment aligned to the standards and objectives of the learning target?			
Is the student aware of the teacher's expectations for the assessment (e.g., did the student read and understand previously submitted Feedback by the teacher?)			

Appendix B

Survey Questions

1. How much experience do you have with online instruction?
2. Do you speak a second or third language at home?
3. How long have you studied the target language?
4. Did you use technology in previous foreign language classes?
5. What experience do you have with learning a foreign language?
6. Suppose you had to select between two courses, one hybrid, one traditional, what would influence your decision?

   Probe: What factors of an online course are most important for you?

   Probe: What factors of a traditional course are most important for you?
7. What apps do you use to help you with school assignments, specifically language classes?
8. Do you have access to a computer at home?
9. Do you have access to the Internet at home?
10. What is your perception of the lesson presented in the video? (Online link was provided.)

    Probe: Could you comment on what the lesson is about?
11. How do you feel about learning a language using instructional technology?

    Probe: Could you elaborate?

Appendix C

A Comparison of Pre and Post Test Results Following the Intervention of Adaptive Learning Using Online Technology

Table C1

A Comparison of Pre and Post Test Results Following the Intervention of Adaptive Learning Using Online Technology

Students' Identifi-cation	2018-2019 Interpre -tive Listening % Points	2019-2020 Interpre-tive Listening % Points	Interpre-tive Listening Gain/ Loss	2018-2019 Interpre-Tive Reading % Points	2019-2020 Interpre tive Read-ing % Points	Interpre-tive Reading Gain/Loss
1	88%	65%	-23%	76%	77%	1%
2	75%	65%	-10%	77%	40%	-37%
3	38%	48%	10%	40%	61%	21%
4	75%	48%	-27%	66%	58%	-8%
5	88%	74%	-14%	73%	79%	6%
6	88%	35%	-53%	83%	0%	-83%
7	100%	87%	-13%	100%	87%	-13%
8	100%	48%	-52%	63%	52%	-11%
9	100%	0%	-100%	68%	31%	-37%
10	100%	74%	-26%	85%	74%	-11%
11	100%	78%	-22%	83%	66%	-16%
12	88%	74%	-14%	63%	83%	20%
13	100%	0%	-100%	66%	40%	-26%
14	88%	48%	-40%	71%	75%	5%
15	88%	78%	-9%	91%	61%	-30%
16	88%	65%	-22%	84%	78%	-6%
17	88%	74%	-14%	67%	86%	18%
18	88%	70%	-18%	76%	34%	-42%
19	100%	61%	-39%	89%	70%	-19%
20	100%	61%	-39%	63%	71%	8%
21	100%	83%	-17%	86%	70%	-16%
22	100%	78%	-22%	91%	73%	-19%
23	100%	74%	-26%	55%	86%	30%
24	100%	65%	-35%	46%	61%	15%
25	88%	57%	-31%	61%	13%	-48%
26	88%	74%	-14%	61%	0%	-61%

Appendix D

Rate of Change of Students Pre and Post Test Scores

Table D1

Rate of Change of Students Pre and Post Test Scores

N=26	IL Score	% Change	IR Score	% Change	Tier before study	Tier after study
1	74%	-16.01	79%	9%	Lower Tier	Mid-Tier
2	74%	-26.09	74%	-13%	Lower Tier	Mid-Tier
3	78%	-21.74	66%	-20%	Lower Tier	Lower-Tier
4	65%	-25.47	78%	-7%	Lower Tier	Mid-Tier
5	74%	-26.09	86%	55%	Lower Tier	Mid-Tier
6	65%	-26.14%	77%	1%	Upper-Tier	Mid-Tier
7	65%	-13.33%	40%	-48%	Upper-Tier	Low-Tier
8	48%	25.86%	61%	53%	Upper-Tier	Low-Tier
9	48%	-36.23%	58%	-11%	Upper-Tier	Low-Tier
10	35%	-60.47%	0%	-100%	Upper-Tier	Low-Tier
11	87%	-13.04%	87%	-13%	Upper-Tier	Upper-Tier
12	48%	-52.17%	52%	-18%	Mid-Tier	Low-Tier
13	0%	-100.00%	31%	-54%	Mid-Tier	Low-Tier
14	74%	-15.53%	83%	32%	Upper-Tier	Mid-Tier
15	0%	-100.00%	40%	-39%	Low-Tier	Low-Tier
16	48%	-45.34%	75%	7%	Low-Tier	Low-Tier
17	78%	-10.56%	61%	-33%	Low-Tier	Low-Tier
18	74%	-15.53%	86%	27%	Mid-Tier	Mid-Tier
19	70%	-20.50%	34%	-56%	Upper-Tier	Low-Tier
20	61%	-39.13%	70%	-21%	Upper-Tier	Low-Tier
21	61%	-39.13%	71%	13%	Upper-Tier	Low-Tier
22	83%	-17.39%	70%	-18%	Upper-Tier	Mid-Tier

Table D1 1 (Continued)

N=26	IL Score	% Change	IR Score	% Change	Tier before study	Tier after study
23	78%	-21.74%	73%	-20%	Upper-Tier	Mid-Tier
24	65%	-34.78%	61%	34%	Upper-Tier	Low-Tier
25	57%	-35.40%	13%	-79%	Low-Tier	Low-Tier
26	74%	-16.01%	0%	-100%	Mid-Tier	Low-Tier