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Universal Design for Learning: Is Training Making a Difference in Teacher Pedagogy

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Universal Design for Learning:

Is Training Making a Difference in Teacher Pedagogy

By

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Dedication

To my husband, Richard Sizemore, and my children, Chelsea, Coleman, and Carson, who always believe in me, support me, and encourage me in all I do. To my parents, Donald and Beth Meadows, who have taught me that hard work, determination, and perseverance are character traits to be proud of. I could not have completed this doctoral process without you all.

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Abstract

David H. Rose and his colleagues at the Center for Applied Specialized Technology (CAST), a non-profit organization specializing in educational research and development, worked for over one quarter of a century to improve learning opportunities for all individuals (Rose, 2012). In the late 1990s this work led to a set of principles known as Universal Design for Learning (UDL), a research-based instructional framework grounded in neuroscience and educational research that allowed teachers to proactively identify barriers that might exist between students and learning and account for those barriers during lesson development and implementation (CAST, 2015). One school district in southwest Georgia provided UDL training for faculty members of district high schools between 2013 and 2017. The purpose of this study was to gather instructional coach perceptions of the impact UDL had on teacher pedagogy and lesson planning practices. The researcher conducted a qualitative, descriptive study through individual face to face interviews of eight high school instructional coaches serving in the designated district. Findings indicated that instructional coaches considered UDL to have impacted both teacher pedagogy and lesson planning practices; however, several concerns surfaced during interviews. Instructional coaches were concerned about the amount of time it takes to properly plan for UDL as well as the training and support from consultants and school level leadership. The researcher discussed implications for professional development format and support.

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CHAPTER I: INTRODUCTION

Education in the 21st century included students with diverse needs who required the inclusion of instructional supports in order to be successful (King, Williams, & Warren, 2011). One of the challenges faced by 21st century educators, according to King Williams, and Warren (2011) was meeting the needs of all the diverse learners who share a single classroom. Rose and Meyer (2002) suggest teachers who lack proper preparation and support to meet the needs of diverse learners have feelings of frustration, discouragement, and seclusion (Rose & Meyer, 2002).

Inclusion of strategies which support all learners was an afterthought rather than an intentional process in design of lessons. Most teachers still used a teacher-centered instructional method and students were supposed to adapt to the teaching style of the teacher (Rappolt-Schlichtmann, Daley, & Rose, 2012). In order to successfully engage the diverse student population, teachers needed to simultaneously address challenges and barriers as well as establish and monitor learning goals (Coyne et al., 2006). Educators needed cutting edge, research-based approaches that met the physical, social, and emotional needs of the students (King et al., 2011). In 2007, the Center for Applied Specialized Technology (CAST) designed the Universal Design for Learning (UDL) framework, which concurrently addressed the need for tiered instruction, inclusion of technology for teaching and learning, and instructional accommodations and supports for students in the 21st century classroom (Jimenez, Graf, & Rose, 2007).

All students were expected to succeed, and it was the job of the teacher to reach these children even though each child came to school with varying ability, background, prior

knowledge, and handicap (Rose, 2012). Rose and his colleagues at CAST, a non-profit organization specializing in educational research and development, worked for over one quarter of a century to improve learning opportunities for all individuals (Rose). In the late 1990s this work led to a set of principles known as Universal Design for Learning (UDL) (Rose). CAST scientists studied not only the obvious differences between students; race, ethnicity, and disabilities, but also the hidden differences revealed by cognitive neuroscience. Scientists learned that not only did students learn differently from each other, but also a single student might learn differently from day-to-day based on their own feelings and emotions (Dewey, 1902; Fischer, Bullock, Rotenberg, & Raya, 1993; Rose). UDL's framework was designed to address these variabilities.

Background Information on Universal Design for Learning

UDL was based on three principles which corresponded to important aspects of any learning environment (Rose, 2012). In order for learners of varying abilities and interests to understand and internalize information, 1) material needed to be presented in a variety of ways (Rappolt-Schlichtmann et al., 2012), 2) there needed to be ample opportunity for the learner to interact with the material both physically and mentally (Dewey, 1902; Rose), and 3) there needed to be an opportunity for the learner to self-assess their own level of learning and set goals that led to a higher level of understanding (Rose; Meyer, Rose, & Gordon, 2014). Rose described a correlation between the "what, how, and why" (p. 51) of learning and the three guiding principles of UDL (Meyer et al., 2014).

The "what" of learning, or ways information was presented, corresponded to the principle of providing multiple means of representation (Rose, 2012; Meyer et al., 2014). Varied learners required several types of media and presentation methods in order to process information

(Dewey, 1902). When learners were given options for "comprehension, perception, language, mathematical expressions, and symbols" (Meyer et al., p. 54) their various needs could be more easily supported. By offering multiple means of representation the needs of all learners were considered and accommodated in the design of the lesson so there was a greater opportunity for all learners to experience the material in a way they could understand. Students with barriers such as dyslexia, language, and blindness might be able to understand the material if it were presented in a verbal format, their native language, or braille. The medium used to present the material was the barrier, not necessarily the cognitive ability of the student (Meyer et al.).

Accessing the material was only one type of barrier many students needed to overcome (Meyer et al., 2014). Students also varied in their life experiences, which affected their background knowledge, approaches they might have when encountering new knowledge, their ability to find patterns and decode symbols, their vocabulary, and their ability to use different types of media. These variabilities came from multiple factors including cultural and biological aspects, socioeconomic status, family functioning, and emotional state. Offering multiple means of representation could help overcome some of these barriers (Meyer et al.).

The "how" of learning, how a learner expressed what they knew or how they approached a task, could be compared to the principle of providing multiple means of action and expression (Meyer et al., 2014). For students to become expert learners, they needed to be able to interact with the material in a variety of ways (Dewey, 1902). They also needed to be able to express themselves, make and monitor their own goals, and manage information and resources (Gardner, 2012). This was more readily accomplished by offering options for "executive functions, expression and communication, and physical action" (Meyer et al., p. 55).

Students also varied in their ability to manage and monitor their own learning. To increase this ability, students needed to be given the opportunity to set their own goals, create a plan to reach those goals, monitor their own progress, and develop strategies to help themselves with this process. However, due to differences in background and experiences, some students might not understand how to set goals and monitor progress. Teachers needed to model strategies and offer feedback designed to guide students in their learning. One way to model goal setting and monitoring was by something as simple as a daily learning goal (Rappolt-Schlichtmann et al., 2012) displayed in the classroom or on an assignment that was formatively assessed at the end of the class period or completion of the assignment (Meyer et al., 2014).

Students needed to be given opportunities to work with a variety of multimedia and tools designed to aid in construction and composition all within a leveled support structure so the student grew over time (Gardner, 2012; Meyer et al., 2014). Options for physical interaction with material was also included in this principle. Learners needed to have access to assistive technologies, if needed, and be able to choose the medium through which they responded to and interacted with new material. These options for construction, composition, and physical action could be in the form of drawing, dance, humor or something more technological such as building an interactive world using the latest gaming platform or utilizing speech to text software. This enabled students who were not able to use more traditional methods in education, to express themselves in a way in which they were more familiar (Meyer et al.).

Lastly, the "why" of learning, or student engagement, was addressed by the principle of providing multiple means of engagement. Expertise in this area included "developing interest, purpose, motivation and self-regulation" (Meyer et al., 2014 p. 52). This involved creating an environment that fostered engagement behaviors by offering options for gaining student interest,

encouraging effort and persistence, and improving a student's ability to self-regulate. Engagement varied greatly both between learners and within each learner. A strategy that worked for a particular student while learning math could be ineffective when the same student learned a new language. Meyer et al. suggested that these differences were the result of the amount of choice a student had as well as what a student found pertinent, interesting, important, and threatening.

Learners varied in their reasons and ability to persevere, comfort with collaboration, preferred type of feedback, level of required support or challenge, and their ability to create reasonable goals (Meyer et al., 2014). Learners also varied in their ability to self-evaluate and make corrections in their own behavior, their ability to cope with varying circumstances, and their self-efficacy. Providing options that accommodated these variances created an environment that enabled students to set goals, provided an atmosphere where comfortable struggle was encouraged, and instilled in students the ability to self-assess to know when goals should be adjusted to allow for maximum growth (Meyer et al.).

Using the UDL principles, guidelines, and checkpoints, teachers could plan for expected differences and create flexible lessons to accommodate these differences (Meyer et al., 2014). UDL provided a "new lens for viewing the classroom and the curriculum" (p. 60) and a framework for creating an environment conducive for learning where teachers had high expectations for all students. UDL was a scientifically valid instructional framework grounded in neuroscience and education research (Rose & Meyer, 2002), that was constantly changing and evolving based on research and practice (Rappolt-Schlichtmann et al., 2012). This framework was based on the fact that all students were different and how these differences were accommodated (Meyer et al.).

Why Universal Design for Learning

A general curriculum accessible to all students that allowed for student differences from the outset and assessed using accommodations that met the needs of all students, was supported at the national level (Individuals with Disabilities Education Act [IDEA], 1997; National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010; U.S. Department of Education [USDOE], 2010). Although most of the work was done at the national level, UDL made gains in awareness (Gordon, Gravel, & Schifter, 2009; Muller & Tschantz, 2003; Samuels, 2009).

Teachers were challenged with the task of developing curricula that facilitated access to the standards for all students in an inclusive classroom (Baldiris Navarro, Zerva, Fabregat Gesa, & Sampson, 2016; Coyne et al., 2006). UDL provided a framework for designing curricula with all students in mind (CAST, 2011). Without the guidance, support, and training necessary to create lessons accessible for all learners, teachers were uncertain about processes needed to incorporate strategies that reached everyone (Courey, Tappe, Siker, & LePage, 2012; Rose & Meyer, 2002). The more qualified teachers were to provide for the learning needs of a highly diverse student population, the more influence they had on student learning (Coyne et al.).

Teachers educated in a traditional manner continued to teach in the style in which they were trained while students spoke and responded to completely different methods of teaching (Prensky, 2001). It could be beneficial to the student for teachers to be equipped with the strategies and supports necessary to adapt lessons to meet the needs of all students at the beginning of pre-service teacher education, rather than as an afterthought when a lesson was unsuccessful (Rose & Meyer, 2002).

Statement of the Problem

Three high schools in a southwest Georgia county were designated as priority schools by the Georgia Department of Education (GaDOE); students in the district scored in the lowest 5% of students on state achievement assessments (GaDOE, 2015a). To remove the priority school designation, student achievement had to improve. The three high schools applied for and were awarded a School Improvement Grant (SIG), one in 2011 and two in 2014, which provided funds, professional development, and support intended to improve student achievement (GaDOE, 2015b; GaDOE, 2015c). All three high schools chose to provide professional development in UDL, which is supported by the GaDOE as "an essential component in providing for students with disabilities, English language learners, and low-achieving students to achieve success" (GaDOE, 2011, p. 25).

To reduce barriers to achievement for the students in this county, teachers needed to be able to plan and implement lessons intended to reach all students. To help address this issue several schools in this county provided training on UDL. Thus the researcher proposed to study to what extent UDL impacted teacher pedagogical practices.

Research Questions

1. To what extent do instructional coaches perceive UDL has influenced teacher pedagogy in a southwestern Georgia county?
2. To what extent do instructional coaches perceive UDL has influenced teacher lesson planning practices in a southwestern Georgia county?

Conceptual Framework

For the purposes of this study, the researcher focused on perceptions of instructional coaches of schools where UDL training had taken place to determine how UDL influenced teacher pedagogy and lesson planning practices (See Figure 1).

As pictured in Figure 1, the three UDL principles, multiple means of representation, action and expression, and engagement (Meyer et al., 2014) equally impacted teacher pedagogy and lesson plan design. Meyers et al. suggested each of these principles correlated to a network of the brain responsible for different aspects of learning. Teachers in this southwest Georgia school district were trained in each of these three principles to reach all students and reduce barriers in all aspects of learning.

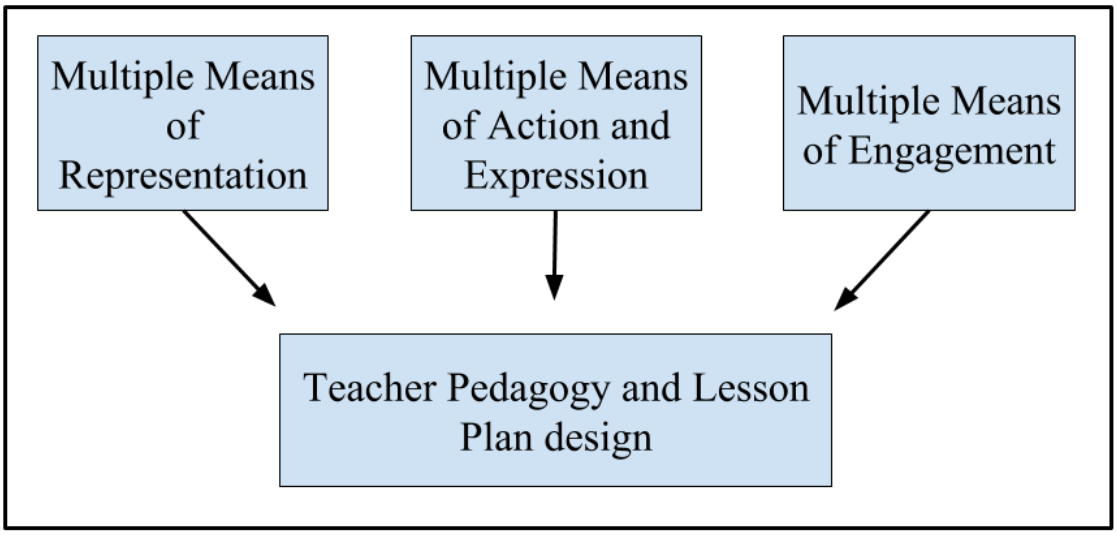

Figure 1. Universal Design for Learning Conceptual Framework. The conceptual framework for this study reflected the three different core principals of UDL and the impact of the use of the principals on teacher pedagogy and lesson design. The arrows pointing from each principle suggested that each UDL principle impacted teacher practice.

Significance of the Study

"UDL is a relatively new framework" (Rappolt-Schlichtmann et al., 2012, p. 9) that was evolving based on a cycle of research informing practice and practice informing research. Empirical research was limited in the area of UDL as it applied to impact on teacher pedagogy and lesson planning practices. This study added to the research base for UDL and its impact on teacher pedagogy during planning and instruction.

Study outcomes provided the district with the data needed to plan for additional professional development opportunities to meet the needs of all students. The perceptions of instructional coaches provided district personnel with data to determine if UDL training impacted teacher pedagogy and lesson planning practices. This study was informative to developers of teacher professional development for the district as well as contributed to educational research in the field of UDL.

Instructional coaches at the school level could utilize the results of this study to plan professional development that built on previous training to address the perceived areas of need to effectively plan and teach using the UDL framework. Instructional coaches were able to observe teacher instruction and provided a direct link between teachers and practice and could determine areas that needed additional support and provide training to those teachers in their areas of greatest need.

Participants

In order to gather data from instructional coaches of high schools in the district, purposive sampling was used. Purposive sampling involved selecting informants in a very specific and purposeful way in order to collect more detailed information from a smaller number of participants (Maxwell, 1997; Miles & Huberman, 1994; Teddlie & Tashakkori). The

participants were specifically chosen due to “particularly valuable information” (Teddlie & Tashakkori, p. 25) they had regarding the research questions. Instructional coaches had the opportunity to observe teachers during planning as well as while teaching in the classroom, which made data obtained from their perceptions, a valuable resource. The researcher conducted individual interviews with instructional coaches to collect their perceptions about extent to which UDL training influenced teacher pedagogy and lesson planning practices.

Procedures

The researcher conducted a qualitative, descriptive study of one southwest Georgia school district. The researcher examined perceptions of high school instructional coaches employed in one southwest Georgia school district and gathered data concerning the perceptions of instructional coaches regarding the impact of using the UDL framework on planning and instruction. The qualitative study design was used as it allowed the researcher to gather in depth information needed to get a deeper understanding of how UDL influenced teacher pedagogy and lesson planning in the district studied.

The superintendent of the district was contacted for permission to conduct the study and access contact information to contact district employees. Once superintendent permission was obtained, and permission gained from the Internal Review Board (IRB) of the college, the researcher contacted the principal of each of the district high schools and gained consent to contact instructional coaches. The initial contact emailed to each principal included a description of the study as well as a link to a digital informed consent form. Principals who agreed to have their instructional coaches participate clicked agree and entered their email address as an electronic signature. The researcher then used the employee contact information to send an email to instructional coaches of approved district high schools requesting participation in the study.

The email included a description of the study, a copy of the interview questions and a copy of the informed consent form. Instructional coaches interested in participating in the individual interview replied to the email with a date, time, and location for the interview to take place. Informed consent forms were signed at the beginning of the interview process, prior to the interview.

The researcher used a semi structured interview guide approach, which allowed participants to explain in detail and elaborate on views and perceptions and the researcher to gather in-depth rich details important to the study (Teddlie & Tashakkori, 2009). These perceptions were organized into themes based on responses. Themes were used to draw conclusions or make generalizations that informed instructional support personnel regarding professional development in UDL in order to strengthen perceived areas of weakness. The interviews were recorded and transcriptions were sent to participants for member checking and to verify accuracy of the transcriptions.

Limitations

This researcher conducted the study in a southwestern Georgia school system, which included three high schools. The participants were chosen using purposive sampling to include those with first-hand knowledge of both UDL professional development and teacher pedagogical practices. When UDL training was provided, there were four high schools in the district. Two of the high schools in the district utilized the same facilitator to train staff in the use of the UDL framework in instruction and planning. One high school (high school A) was trained in the 2013-2014 school term with follow up training in the 2016-2017 school term. This school was closed at the end of the 2016-2017 school term and the faculty was dispersed between the other three district high schools. A second high school (high school B) was trained during the 2014-2015

school term and the third high school (high school C) was trained during three consecutive school terms: 2014-2015, 2015-2016, and 2016-2017. The fourth high school did not provide faculty wide training, but some faculty members from the fourth high school participated in the training held at other high schools in the district.

Factors that influenced the study included ability to make contact with principals and instructional coaches in this district and limited generalizability of the findings due to a small study population. Participants who volunteered were contacted; however, getting each instructional coach to volunteer was difficult. The researcher made multiple attempts to contact instructional coaches in order to complete as many interviews as possible. Additional factors included periodic changes in administration, instructional coaching staff, and teaching staff. Although all four high schools were involved in UDL training, some of the instructional coaching support staff were no longer working at the same school. This was a problem when interviewing the instructional coaching staff as they might be new to the high school and observations might be limited.

Generalizability, the ability to use a small sample of a population to make statements about the entire population (Johnson & Christensen, 2014), was limited. The researcher used an exploratory study to investigate instructional coaches' perceptions regarding the inclusion of the UDL framework in classroom instruction and planning. Even though this approach yielded rich data, exploratory designs were often not generalizable beyond the constraints of the study (Teddlie & Tashakkori, 2009). This study was conducted in only one Southwest Georgia school district, and the small sample size limited the ability to generalize the findings to other districts. To collect data representative of a population, Johnson and Christensen (2014) suggested the

sample be randomly generated. However, due to the subject area, the researcher planned to use purposive sampling which also limited the generalizability of the findings.

Delimitations

The researcher was employed in the district for more than 20 years. During this time the researcher made connections with many of the faculty of the schools who might be involved in the study. These connections might benefit the study by increasing the response rate and willingness of participants to be involved in the individual interviews. These relationships may increase the honesty of the answers obtained to questions in the study.

Definition of Terms

Cognitive Neuroscience: The field of study linking the brain and other aspects of the nervous system to cognitive processing and, ultimately, to behavior (Sternberg, Sternberg, & Mio, 2012).

Pedagogy: Refers to the "method or practice of teaching" (Mathews, 2016, p. 16) or the "activities that evoke changes in the learner" (Westbrook et al., 2013, p. 7). For the purpose of this study pedagogy referred to methods and strategies utilized during classroom instruction and planning.

Scaffolds: Learning supports used when initially learning new material. Supports were removed as concepts were mastered and supports became unnecessary (CAST, 2011; Rappolt-Schlichtmann et al., 2012)

Training: Referred to programs offered to practitioners as a way to establish ongoing learning in research based best practices (Dufour & Eaker, 1998). For the purpose of this study training referred to programs offered educational practitioners as a way to improve practice through research based best practices to educate all students.

Universal Design (UD): Design of environments and products to be accessible, to the greatest extent possible, by all people without adaptation or specialized design (Mace, 1998)

Universal Design for Instruction (UDI): Applying UD to postsecondary classroom instruction and inclusive instructional strategies to provide access to learning for students regardless of disability, ethnic background, or age (McGuire, Scott, & Shaw, 2006)

Universal Design for Learning (UDL): Applying UD to learning focusing on K-12 education (Zeff, 2007). CAST, as defined by the Higher Education Opportunity Act (HEOA) (2008, p. 11)

> The term, universal design for learning, means a scientifically valid framework for guiding educational practice that: (a) provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and (b) reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient. [Pub. L., No. 110-315, 103(a) (24)]

UDL Framework: An organized structure of the UDL concepts into principles, guidelines, and checkpoints that is used to guide planning and instruction (Meyer et al., 2014).

UDL Principles: The three fundamental ideas, based on neuroscience, that are used to organize the guidelines in the UDL framework (National center on Universal design for Learning [NCUDL], 2014).

Universal Instructional Design (UID): Applying UD, at the postsecondary level, to instructional design of courses rather than classroom environment. UID focusses on identifying and eliminating barriers to teaching and learning for all students (Zeff, 2007).

Summary

In-service teachers were expected to meet the needs of the various learners in their highly diverse classrooms (Gordon et al., 2009). One way to meet the needs of all learners was to incorporate the UDL framework in lesson development and preparation (Jimenez et al., 2007). Researchers reported a positive outcome for students and teachers when teacher training emphasized application of UDL principles (Baldiris Navarro et al., 2016; Dalton & Smith, 2012; McGhie-Richmond & Sung, 2013; McGuire-Schwartz & Arndt, 2007; Meo, 2008; Spooner, Baker, Harris, Ahlgrim-Delzell & Browder, 2007; van Kraayenoord, Waterworth, & Brady, 2014; Williams, Evans & King, 2012).

UDL was a research-based instructional framework grounded in neuroscience and educational research (CAST, 2015) that allowed teachers to proactively identify barriers that might exist between students and learning and account for those barriers during lesson development and implementation (Meo, 2008). The UDL framework was recognized by state and national educational organizations as a practical framework for education (Every Student Succeeds Act, 2015; General Assembly of Maryland, 2010; Hall, Meyer, & Rose, 2012, HEOA, 2008; National Down Syndrome Society, 2012; USDOE, 2004; USDOE, 2010). In-service UDL training had potential benefits for all teachers; however, it was not being widely implemented and so literature was minimal. More research was needed in order to determine if UDL was making a difference in teacher pedagogy and lesson development (Jordan Anstead, 2016; Hatley, 2011; Winter, 2016).

The researcher used a qualitative approach to interview high school instructional coaches in one southwest Georgia school district, where UDL training had taken place, to investigate the impact of utilizing the UDL framework during planning and instruction. In this chapter, an

introduction to the UDL framework was presented, including how each principle related to learning, and the problem statement and purpose were discussed. The researcher proposed to examine the influence of UDL training on teacher pedagogy and lesson planning by examining perceptions of instructional coaches.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

There were many changes to education in America throughout the country's history. In the nation's infancy, education was limited to intelligent, often wealthy, young men as part of instruction centered on religion (Educational Policy Institute [EPI], 2011). Wealthy families paid for their children to be educated and it was not until the late 1800s that education was offered at no cost to the young white males in most large cities throughout the nation (EPI).

During the 19th and 20th century, according to researchers from EPI (2011), education grew from one room school houses to the establishment of elementary and secondary schools. During this time, an education was still not readily accessible to most women, African Americans or Native Americans. By the 1920s, only 78% of children participated in formal schooling, which consisted of mostly elementary schools, grades first through fifth. It was not until Brown v. Board of Education in 1954 that access to equal opportunity for education was mandated for all children (Hatley, 2011; Wong & Nicotera, 2004). By 1980 more than 93 percent of minority and white school-age children attended public schools; elementary, middle, and high schools grades 1 -12, but there was little tracking of student performance (EPI).

Student achievement became the focus in the 1988 reauthorization of the Elementary and Secondary Education Act (ESEA). States were held accountable for showing improvements in test scores, but often states did not require testing of the students with disabilities (Hatley, 2011). It was not until the 2001 reauthorization of ESEA known as No Child Left Behind (NCLB)

(2001) that states were mandated to include scores for subgroups such as students of low socioeconomic status, English language learners, and students with disabilities.

The NCLB regulations (2001, p. 26) state that schools are to provide for

> (I) the participation in such assessments of all students, (II) the reasonable adaptations and accommodations for students with disabilities, necessary to measure the academic achievement of such students relative to State academic content and State student academic achievement standards, and (III) the inclusion of limited English proficient students, who shall be assessed in a valid and reliable manner and provided reasonable accommodations including, to the extent practicable, assessments in the language and form most likely to yield accurate data on what such students know and can do in academic content areas.

The reauthorization of the Individuals with Disabilities Act (IDEA) in 2004 known as the Individuals with Disabilities Education Improvement Act (IDEIA) included the use of universal design, defined in section three of the Assistive Technology Act (ATA) of 1998, as "a concept or philosophy for designing and delivering products and services that are usable by people with the widest possible range of functional capabilities" (p.8). The "Participation in Assessments" section of the IDEIA stated that "The State educational agency (or, in the case of a district wide assessment, the local educational agency) shall, to the extent feasible, use universal design principles in developing and administering any assessments" (p.42).

Universal design required a proactive thought process, during design of teaching and learning materials that included attention to all learners' diverse learning needs (Rose & Meyer, 2002). This proactive framework for curriculum design was included in educational policy from

NCLB waivers in 2010 to Every Student Succeeds Act of 2016 where Part A specifically states, "assessment items (xiii) be developed, to the extent practicable, using the principles of universal design for learning." (p. 20). Universal Design for Learning (UDL) was recognized as the most used framework for the design and development of curricula that was effective and inclusive for all learners (Hall, Meyer, & Rose, 2012).

History of Universal Design for Learning

Throughout history, education was considered a reflection of the current political views (Pinar, Reynolds, Slattery, & Taubman, 2008). According to Pinar et al., politics had a tremendous effect on students through both direct and hidden curriculum. The focus on students with disabilities that started in the 1970's generated a number of government policies, which centered on allowing all students access to a quality education (Hehir, 2009).

The No Child Left Behind Act (NCLB) of 2001 set strict requirements for disadvantaged students and students with disabilities (U.S. Department of Education [USDOE], 2004). In 2008 the U.S. Congress passed the Higher Education Opportunity Act (HEOA) which defined UDL as "a scientifically valid framework for guiding educational practice" (HEOA, 2008, p. 12). Governor Martin O'Malley of Maryland signed the Universal Design for Learning bill into law in May of 2010, which marked the nation's first state level UDL bill (General Assembly of Maryland, 2010). This bill authorized a task force to investigate the use of UDL principles in Maryland's education system. UDL was incorporated into the National Educational Technology Plan the same year encouraging the use of the UDL principles to "enable the best accommodations for all students" (p. xvii) and reduce barriers to a quality education (USDOE, 2010).

In 2011 the USDOE initiated a process that states needed to follow in order to waive key NCLB requirements (National Down Syndrome Society [NDSS], 2012). “These flexibility requests waive requirements from NCLB in exchange for promises of education reform” (NDSS, p. 1). In 2012 the NDSS completed an analysis of these flexibility requests. Researchers from NDSS discovered that 31 of the 38 states who had requested a waiver included implementation of the principles of UDL (NDSS).

Across the country, initiatives to utilize the UDL framework were included in many state level education planning. Researchers from the National Center on UDL (NCUDL) reported in 2013 that UDL was part of the state student performance plans for Arizona, Delaware, Florida, and nine other states. Institutions of higher learning in Alabama, California, Colorado, and fourteen other states had resources, courses, or programs that utilized UDL and eight states incorporated UDL in the state professional development for teachers (NCUDL, 2013c) (See Table 1).

As reflected in Table 1, initiatives to utilize the UDL framework were included in many states’ educational resources. State websites included resources and information school districts could use for planning purposes for the education of all students.

Most recently, Every Student Succeeds Act (ESSA) of 2015 required each state to develop a plan, to be initiated in the fall of 2017, to ensure minority students and students with low socioeconomic standing were served by proficient teachers; identified based on each state’s teacher effectiveness measure (Burnette, 2017). ESSA encouraged the use of UDL principles in assessment design, comprehensive literacy instruction, and to aid in gaining “access to personalized rigorous learning experiences” (p. 172) that incorporated the use of technology to accommodate all students’ learning needs (ESSA, 2015).

Table 1

UDL Initiatives Across the United States of America in 2013

States with UDL in the Performance Plan	States with UDL in Institutions of Higher Learning	States with UDL in Department of Education	States with UDL in Professional Development Plan
Arizona	Alabama	Colorado	Louisiana
Alaska	Arizona	Delaware	Maine
Delaware	California	Florida	Massachusetts
Florida	Colorado	Iowa	Michigan
Hawaii	District of Columbia	Kansas	Mississippi
Louisiana	Kentucky	Kentucky	Pennsylvania
Massachusetts	Massachusetts	Maryland	Texas
Minnesota	Missouri	Pennsylvania	Virginia
Montana	Oregon	Virginia	
New York	Rhode Island	West Virginia	
North Dakota	South Carolina		
Rhode Island	Texas		
Texas	Vermont		
	Virginia		
	Washington		
	West Virginia		
	Wisconsin		

All students were not created equal; however, much of the time curriculum was created with the average student in mind (Kumar & Wideman, 2014). According to the NCUDL (2013b), UDL was a framework that was intended to consider all types of students while designing curriculum. UDL was based on the Universal Design (UD) ideas of architect Ronald Mace, who designed products useable by a wide range of people. Mace designed architectural supports by considering seven principles of universal design: equitable use, flexibility, simple

and intuitive, perceptible information, tolerance for error, low physical effort, and size and space for approach and use (Zeff, 2007).

The same philosophy used by Mace was beneficial to design of educational materials intended to reach all students (Orkwis & Mclane, 1998) and provided access to flexible and adaptable instruction (Mcguire, Scott, & Shaw, 2006). Several institutions for higher learning utilized the UD idea to modify instruction in different ways. Universal Instructional Design (UID) was started in a postsecondary institution in Canada and was used by faculty to modify course design to eliminate barriers to learning. Universal Design for Instruction (UDI) was started in a Connecticut post-secondary institution to focus on an increase in diversity of college students including factors such as age, ethnic background, and disability. The focus was on classroom instruction and inclusive instructional strategies.

The difference in UDL and other UD programs in education was the focus on K-12 learning and the learning environment through a connection to teacher pedagogy and use of technological features, which eased access to multiple means of representation, action and expression, and engagement (Goforth-Melroy, 2014; Rose, Harbour, Johnston, Daley, & Abarbanell, 2006). UDL principles allowed teachers to design lessons, from the start, that were intended to reach all students, regardless of cultural background, learning style, or ability, by offering adaptable options based on student performance (Baldiris Navarro, Zerva, Fabregat Gesa, & Sampson, 2016; Jimenez, Graf, & Rose, 2007; Kumar & Wideman, 2014; Lopes-Murphy, 2012). These principles were used to provide flexibility in presentation, options for engagement, and options for how students demonstrated knowledge (NCUDL, 2013a). Use of the framework forced teachers to reevaluate the way they approached the process of teaching and learning (Jimenez et al.; Meyer & Rose, 2005). UDL encouraged teachers to use some of the

same practices they previously used, but in a proactive rather than a reactive manner (Jimenez et al.).

Researchers also encouraged the use of technology in the effort to help support increasingly diverse classrooms (Jimenez et al., 2007; Meyer & Rose, 2005; Rose, Hasselbring, Stahl, & Zabala, 2005). The purpose of UDL, according to Rose et al., was to provide teachers with a framework they could use to identify potential obstacles that hindered the learning process and develop a plan to help students overcome these obstacles. Technology aided educators in the creation of a curriculum that lacked as many obstacles a possible as well as enabled more students to access the curriculum by providing devices that aided students in attaining the needed material (Meyer & Rose; Rose et al.).

Why Universal Design for Learning?

The UDL framework forced teachers to change the way they thought (Goforth-Melroy, 2014; Jimenez et al., 2007). General education teachers used large group (i.e., whole class) instruction more frequently than small group instruction (Gelzheiser, Meyers, Slesinski, Douglas, & Lewis, 2012; Moody, Vaughn, & Schuum, 2012), and teachers used lecture, drill and practice, and teacher-directed instruction more frequently than more personal instructional techniques (McKinney & Frazier, 2008). Researchers agreed that there was a need for change in the pedagogical practices of most teachers (Bowman 2016; Embry, Parker, McGuire, & Scott, 2006; Goforth-Melroy; Izzo, Murray, & Novak 2008; Meyer & Rose 2000; Zhang 2005). Noddings (1983) recommended that the "proper consideration" (p. 187) be given to the students being educated and that these students be influential in their own learning by deciding what they, as students, wanted to learn and the best way to learn it.

Lopes-Murphy (2012) suggested that an "educational blueprint that considers students' diversities" (p. 227) increased opportunities for addressing learner needs and decreased barriers to learning. Every person created meaning through personal experience, this meaning connected to previous knowledge (Schiro, 2013). Due to this, Schiro explained, no two people had the same exact knowledge set; instead knowledge was a result of a person's individual experiences. Thus education should not be a one size fits all approach and educators should consider all aspects of life when creating curricula (Noddings, 1983; Rose & Strangman, 2007). Teachers who followed the ideals of UDL considered all students as they initially planned a lesson rather than incorporating a cookie cutter lesson plan that many students would not understand (Center for Applied Specialized Technology [CAST], 2015; Kumar & Wideman, 2014; Lopes-Murphy).

Researchers from NCUDL (2011) explained that the UDL framework was grounded in research in many fields, such as cognitive neuroscience and neuropsychology from which the nine UDL guidelines were developed. A three-year review of educational practices was used to identify practices most effective in reducing barriers identified during the learning process (NCUDL, 2011). Barriers were defined as "anything that restrains or obstructs progress in fulfilling the task at hand" (NCUDL, 2013a, para 14). The combination of research and input from educational practice appealed to many educators and made UDL more acceptable. Educators saw students struggle with inflexible material in the past and agreed that there needed to be some proactive measures to reduce the barriers caused by the lack of flexibility in the materials used to teach the curriculum (Meyer & Rose, 2005).

Principles of UDL

The UDL framework was organized using the three guiding principles of UDL: providing multiple means of representation, or the what of learning; providing multiple means of action

and expression, or the how of learning; and providing multiple means of engagement, or the why of learning (CAST, 2011; Meyer, Rose, & Gordon, 2014). These three guiding principles were intended to correlate to "learner differences across the recognition, strategic, and affective learning networks" (p. 127) of the brain (Kumar & Wideman, 2014). These principles were further broken down into nine guidelines (NCUDL, 2011) and 33 specific checkpoints under these nine guidelines (See Figure 2), detailing how to overcome the barriers inherent in most existing curricula and serving as the basis for incorporating options and the flexibility that were necessary to maximize learning opportunities for learners with diverse needs (CAST).

The guiding principles are used to divide the UDL framework into three sections. As shown in Figure 2, each principal is divided into three subsections based on guidelines specific to each principle. The nine guidelines are further explained using checkpoints for various options that are offered to students.

Multiple Means of Representation

According to researchers from NCUDL (2014), how information was comprehended and understood was different for different learners. Lopes-Murphy (2012) described these differences in terms of neurological pathways called recognition networks- "how individuals identify, collect, and categorize information" (p. 229). Modifications were to be made to educational resources so material was presented in a variety of modes and methods (Baldiris Navarro et al., 2016) allowing more individuals to identify with and make connections with the material (NCUDL). The researchers from NCUDL explained that there was no one method of presentation that was best for all learners. While planning lessons, teachers needed to intentionally use various methods of presentation including auditory, kinesthetic, and visual (Lopes-Murphy).

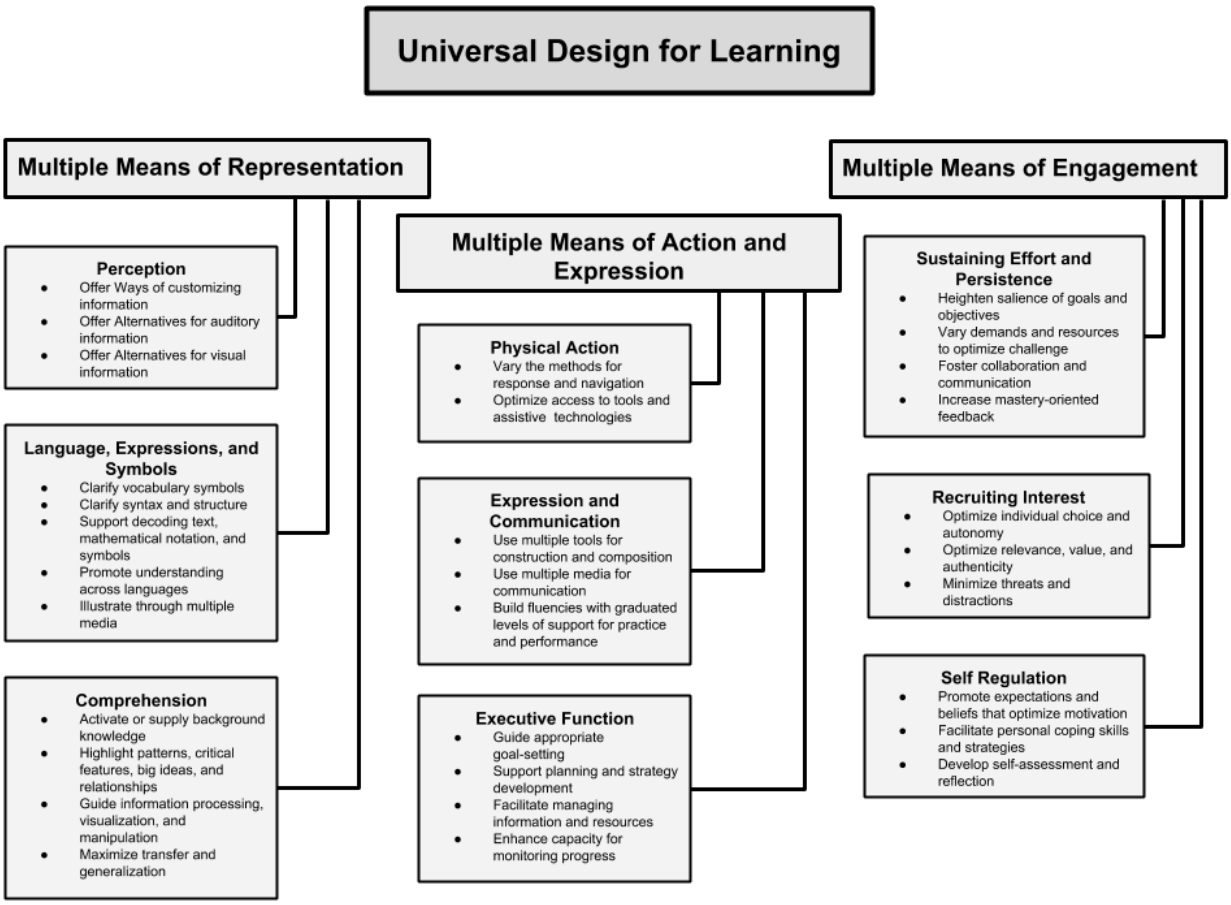

Figure 2. CAST Guiding Principles.

Multiple means of representation, "information presentation and knowledge acquisition" (Lopes-Murphy, 2012 p. 227), was broken down into three guidelines which provided options for perception, options for language, mathematical expressions, and symbols, and options for comprehension (NCUDL, 2014). The NCUDL researchers described options for perception as providing multiple ways to receive information through auditory, visual, and kinesthetic means as well as offering ways for learners to adjust material such as text size and sound options. Options for language, expressions, and symbols included clarification of vocabulary and symbols, use of multiple types of media, and decoding of mathematical notations and symbols. Lopes- Murphy suggested teacher lesson planning needed to include opportunities for a deeper

processing of the material through identification of key concepts and creation of connections to solidify meaning.

One strategy mentioned frequently in research was the connection between past experiences and new material (Campbell, 2011; Degen, 2014; Strother, 2007; Tokuhama-Espinosa, 2011). This strategy was the basis for providing options for comprehension, the third guideline in the principle of representation (NCUDL, 2014). The NCUDL researchers suggested activating or supplying background knowledge aided comprehension. When new material was related to past experiences in some way, learning happened faster and the information was retained for longer periods of time (Campbell; Degen; Strother). Tokuhama-Espinosa stated that teachers were more successful when they attempted to link what was happening in the students' lives with what was being taught in class. Degan suggested one way to keep students in a state of "relaxed alertness" (p. 20) was by making the learning relate to real world experiences. Highlighting patterns and relationships and guiding information processing were other comprehension strategies suggested by the researchers from NCUDL. Schiro (2013) explained that learning took place as individuals encountered new items and attempted to make meaning of the items. These experiences created thinking, which created learning (Schiro).

Multiple Means of Action and Expression

There were many obstacles learners encountered while navigating a learning environment (NCUDL, 2014). This navigation and the ability to express what was already known and what needed to be learned, was different for each learner. Lopes-Murphy (2012) described the neurological pathways responsible for action and expression as the strategic network or "how learners organize and express ideas" (p. 229). NCUDL researchers suggested using multiple means of action and expression aided in knowledge acquisition for students who had physical or

mental disabilities that affected movement and executive functions, those with language and cultural barriers, as well as varied individual student preferences.

Multiple means of action and expression were broken down into options for physical action, expression and communication, and executive functions (NCUDL, 2014). Physical action, according to the NCUDL researchers, included the ability to interact with the learning environment and materials. Many researchers (Strother, 2007; Tokuhama-Espinosa, 2011; Van Dam, 2013) agreed that listening alone did not create the neural connections needed for learning. There needed to be active engagement (Strother; Tokuhama-Espinosa; Van Dam). Those with physical disabilities, limited mobility, impaired sight and hearing, as well as executive function impairments, required access to certain assistive technologies and alternative ways to respond and navigate through material (NCUDL).

Expression and communication were vitally important to learning experiences (NCUDL, 2014). Lopes-Murphy (2012) encouraged educators to offer "multiple options for students to express their understanding and knowledge acquired" (p. 227). Alternative methods of communication, provided learners with a variety of options to communicate and demonstrate what they had learned and to move beyond traditional pencil paper assessments (Baldiris Navarro et al., 2016; Lopes-Murphy). Alternatives came in the form of multiple media options for communication such as writing, speaking, or drawing, multiple tools for construction and composition such as spell checkers, text-to-speech software, and calculators, and graduated levels of support for increasing fluency such as scaffolding, feedback, and use of models.

The third guideline for the action and expression principle was to provide options for executive function (NCUDL, 2014). The researchers from NCUDL described executive function as "a set of mental processes that guide each learner's understanding of patterns and

relationships, planning and organization of time, tasks, and materials, and that guide self-regulation, self-assessment, and decision-making for adjustments based on self-assessment" (Meyer et al., 2014 p.55). Executive function allowed for goal-setting in which the learner set, monitored, and modified goals for long term learning (NCUDL). According to Schiro (2013), a person's innate abilities were stimulated by their own accomplishments and growth. Noddings (1983) suggested that accomplishments were made by having students set their own goals and providing proper guidance to reach those goals. Educators helped facilitate this process by guiding appropriate goal-setting, supporting the development of plans and strategies, helping to manage information and resources, and building capacity for self-monitoring (NCUDL). Schiro explained that this was done by teachers constantly monitoring the progress of the students such as observing the students and documenting the progress they made as well as making notes about any interests they had. Through continuous analytical evaluation, said Schiro, teachers revised the content, organization and structure of their classroom so that students continued to grow.

Multiple Means of Engagement

Lopes-Murphy (2012) described the neurological pathways known as the affective network as "how learners become motivated and engaged in a task" (p. 229). The NCUDL (2014) researchers suggested that affect, "the experience of feeling or emotion" (NCUDL, 2013a, para 5) was a critical part of learning and that learners were remarkably different in this area. These differences were due to the number of different areas of the brain utilizing the affective network (Rose & Meyer, 2002) and came from neurological, cultural, as well as personal sources. One form of engagement worked for one learner and was off-putting to another; for this reason teachers offered multiple options for engagement (NCUDL, 2014).

Multiple means of engagement were subdivided by the NCUDL (2014) researchers into three basic guidelines which included providing options for recruiting interest, sustaining effort and persistence, and self-regulation. Recruiting Interest was seen as a battle teachers faced each day. Information was only accessible if it had been processed by the brain, yet many learners were not interested in the material and so much of what was taught went unprocessed. This material was inaccessible to the learner during instruction or in the future (NCUDL). By providing choices and rewarding effort, learners were involved in the learning process, experienced less anxiety and stress, and were able take ownership of their own learning (Baldiris Navarro et al., 2016; Lopes-Murphy, 2012). One way to accomplish this, according to Degen (2014), was by teaching through real-world projects with academic standards rooted in the requirements of the project. The projects offered students' choices and included areas of interest to the students. Using this approach, the skills necessary to complete the project were learned in an authentic, real world way and actually experienced by the student, making learning more relevant (Degen; NCUDL). UDL also emphasized participation in meaningful activities which were incorporated using instructional centers, small groups, and collaborative projects (Lopes-Murphy).

The Learning environment supported learners who functioned at different levels of motivation and self-regulation; this was accomplished by offering options for sustaining effort and persistence (NCUDL, 2014). To do this, researchers from NCUDL suggested that educators needed to refocus students, refine goals, and reassess resources in order to create an atmosphere for learning. Several researchers noted emotion also played an incredible role in learning, maybe even more than cognition (Hendel-Giller et al., 2010; McCall, 2012; Strother, 2007; Wolfe, 2009). The teacher needed to be aware of the emotional state of the classroom and the students.

The environment should be emotionally stable and the material used should be at a level that allowed the student to experience a relaxed sense of struggle.

Twenty-first century learners also required skills in collaboration and communication, according to NCUDL scientists (2014). While planning lessons teachers needed to make certain all learners had options for "collaboration, critical thinking, inquiry, and problem solving" (Lopes-Murphy, 2012 p. 227). This necessitated an open line of communication between teacher and learner that fostered learners' efforts and persistence toward their goals. This was accomplished using feedback that was relevant, constructive, and mastery-oriented (NCUDL).

The final guideline of the principle of engagement was to provide options for self-regulation (NCUDL, 2014). Providing an atmosphere that encouraged motivation and participation was only part of what is needed for true engagement; the rest came from intrinsic abilities in each learner. Self-regulation included the ability to monitor one's own emotional reactions and adjust in order to cope and engage in the learning environment (NCUDL). The NCUDL researchers suggested educators promoted expectations and beliefs that encouraged motivation such as flexible time lines and use of rubrics, assisted learners with coping skills and strategies by using such things as real life situations and positive reinforcement techniques, and supported self-assessment and reflection by providing such things as progress charts and timely feedback.

Many of the common research based practices teachers used already fit easily into these guidelines (Jimenez et al., 2007; Meyer & Rose, 2005). This ease of incorporation diminished the fear many teachers had over incorporating additional practices into an already over packed curriculum. Pinar et al. (2008) suggested educational activities be assessed for value. This was exactly what was done with the UDL principles. The activities and educational practices used in

classrooms were assessed and the most effective were included into the guidelines set up through UDL (NCUDL, 2011).

Universal Design for Learning Studies

Classrooms in the 21st century were found to be increasingly more diverse (Bowman, 2016; Courey, Tappe, Siker, & Lepage, 2012; Davies, Schelley, & Spooner, 2013; Goforth-Melroy, 2014; Hall, Vue, Strangman, & Meyer, 2004; Kumar & Wideman, 2014; Lopes-Murphy, 2012; McGuire-Schwartz & Arndt, 2007; Winter, 2016) and yet educational practices failed to support student variance (Mathews, 2016). Utilizing UDL principles was shown to be an effective method for increasing ease of which teachers met the needs of students at all levels (Bowman; Goforth-Melroy; Izzo et al., 2008; Katz & Sugden, 2013; Takemae, 2015; Wlodarczyk, Somma, Bennett, & Gallagher, 2015; Zhang, 2005). In a study by Bowman, findings supported the benefits of UD at the postsecondary level, as it applied to students with and without disabilities. Bowman interviewed five faculty members across several institutions and found that faculty agreed Universal Design had value as a framework for creating lessons to meet all learners. Faculty perception of UD was the focus of the study; however, participants described an increase in student engagement, grades and grade point averages, regardless of disability, because of utilizing UD in their classrooms.

Researchers indicated that many teachers were not prepared to use the UDL principles in the classroom (Bowman, 2016; Lopes-Murphy, 2012; Spooner, Baker, Harris, Ahlgrim-Delzell & Browder, 2007; Strobel, Arthanat, Bauer, & Flagg, 2007; Vitelli, 2013; Watkins 2011) and needed more training utilizing the framework (Bowman; Courey et al., 2012; Embry, Parker McGuire, & Scott, 2006; Israel, Ribuffo, & Smith, 2014; Izzo, et al., 2008; Jimenez et al., 2007; Lopes-Murphy, 2012; Takemae 2015; Winter 2016). Researchers concluded training in UDL

(Harms, 2012; Katz & Sugden, 2013; Schelley, Davies, & Spooner, 2011) and a commitment to change (Bowman; Hall et al., 2004; Harms) had a positive effect on teacher pedagogy. Schelley et al. reported an increase in the number of UDL strategies utilized by teachers after training lasting only a few hours and Katz and Sugden noted that a one-day training had a positive effect on student engagement and self-concept. Dalton, Mckenzie, and Kahonde (2012) found that a one-day workshop was used to increase the ability of teachers to differentiate their lessons as well as work collaboratively within the UDL framework. Research suggested although teachers found UDL to be an acceptable treatment for improving student engagement, teachers were hesitant to implement UDL principles in a student-centered classroom (Johnson-Harris, 2014). Teachers expressed a desire for more training and felt that additional training would be necessary to ensure comfort with implementing the UDL framework (Johnson-Harris)

Felton (2012) observed an increase in the variety of teaching techniques utilized, such as scaffolding, providing feedback, use of rubrics, and utilization of graphic organizers and note-taking guides, and increased student engagement and self-monitoring after training in the UDL framework. Further analysis of lesson plans revealed an increase in UDL principles utilized during lesson planning as well (Felton). She also found a correlation between student choice and student engagement indicating a higher level of student choice led to more student engagement in their learning. Findings indicated that those currently trained or currently in training in UDL felt more of a responsibility to create accommodations and offered alternate means of acquiring information that met the needs of all learners (Bell, Higgins, McCoach, & Wilson, 2010; Wyndham, 2010). Teachers also demonstrated an increase in the use of technology to design lessons and engage students (Wyndham).

Researchers suggested that UDL was beneficial as a framework to guide lesson plan development and implementation (Bowman, 2016; Embry et al., 2005; Katz & Sokal, 2016; Katz & Sugden, 2013; Lopes-Murphy, 2012; Mcguire & Scott, 2006; Mcguire-Schwartz & Arndt, 2007; Parker, Robinson, & Hannafin, 2007-2008; Spooner et al., 2007; Strobel et al., 2007; Takemae, 2015; Zhang 2005). Meo (2008) found that general and special education teachers found lesson plans designed using UDL to be more diverse and additional studies described an increase in the use of UDL in teacher lesson plans after initial training (Baldiris Navarro et al., 2016; Courey et al., 2012; Dalton & Smith, 2012; Felton, 2012; Lopes-Murphy, 2012; McGhie-Richmond & Sung, 2013; McGuire-Schwartz & Arndt, 2007; Spooner et al., 2007; Strobel et al., 2007; Takemae, 2015; Williams, Evans, & King, 2012).

Researchers agreed that UDL supported access, participation, and progress for all learners (Jimenez et al., 2007; King-Sears et al., 2015, Kortering, McClannon, & Braziel, 2008; Meo, 2008; Rose & Meyer 2002). Even though empirical research on UDL was found to be minimal (Goforth-Melroy, 2014; Schelley et al., 2011; Spooner et al., 2007), researchers suggested utilizing the UDL principles was beneficial for students with disabilities (SWD) (King-Sears et al.) and showed promise for English Language Learners (ELL) (Lopes-Murphy, 2012). King-Sears et al. used a research design that included a pretest, posttest, and a delayed posttest to compare a treatment group, which utilized UDL principles, to a control group that did not utilize the UDL framework. Although there were no significant differences found between the two groups, there was a significant difference for students with high incidence disabilities (HID). The UDL strategies seemed to work better for the HID students as they outperformed the HID students in the control group, which suggested UDL was beneficial for students with disabilities.

Other researchers found utilizing UDL can improve learning (Bowman, 2016; Coyne, Pisha, Dalton, Zeph, & Smith, 2012; Felton, 2012; Goforth-Melroy, 2014; Katz & Sugden 2013; Mathews, 2016; McGuire-Schwartz & Arndt, 2007) and accessibility (Bowman; McGuire-Schwartz & Arndt). Coyne et al. investigated UDL as it related to literacy instruction. The researchers found when combined with Literacy by Design (LBD), a comprehensive literacy program, students who received UDL enhanced lessons made higher gains than the control group in comprehension abilities (increase of 31 points for the experimental group compared to 13 points for the control group), word attack skills (increase of 21 points for the experimental group compared to 14 points for the control group), listening comprehension (increase of ten points for the experimental group compared to a one point decrease for the control group), and concepts about print (increase of nine points for the experimental group compared to five points for the control group).

UDL was also found to enhance student engagement (Bowman, 2016; Felton, 2012; Goforth-Melroy, 2014; Katz & Sugden 2013; Mathews, 2016; McGuire-Schwartz & Arndt, 2007). Harms (2012) conducted a study in which the curriculum in a postsecondary psychology class was redesigned, through collaboration with the researcher, to include UDL principles. Student perceptions collected during the study demonstrated that students felt more engaged with the material and increased accessibility of material led to positive perceptions of the class overall. Increased engagement in classes which utilized UDL principles, on the college level, resulted in an increase in student grades, progress, persistence, and course completion (Bowman, 2016).

Studies were completed investigating perceptions of UDL from the view of the student (Goforth-Melroy, 2014; Katz & Sugden, 2013; Kortering et al., 2008; Kumar & Wideman, 2014;

Marino et al., 2014; Mathews, 2016; Parker et al., 2007-2008; Schelley et al., 2011). Students surveyed reported an enhanced learning experience during lessons designed using UDL principles (He, 2014). There was a statistically significant increase in student interest and engagement during UDL designed lessons (Smith, 2012) and students reported feeling less stress in a UDL designed classroom (Kumar & Wideman). Kumar and Wideman also found students appreciated the flexibility and opportunity for choice offered through a UDL designed lesson. Katz and Sokal (2016) found that students' main complaint was being distracted due to the noise that accompanied a student-centered environment; however, they had a more positive attitude towards learning after teacher inclusion of UDL principles in lesson design and implementation. Although student perceptions were generally positive, teacher perceptions were often affected by perceived barriers to implementation.

Some teachers expressed a resistance to inclusion of UDL principles stating they were unfamiliar with UDL and needed more training and support and had insufficient time and materials to implement the UDL practices (Bowman, 2016; Hatley, 2011; Vitelli, 2013; Wyndham, 2010). Other barriers to implementation included lack of modeled instruction to implement the framework with fidelity (Hatley, 2011; Jordan Anstead, 2016; Wyndham, 2010) as well as an overall resistance to change (Jordan Anstead). Many believed that a knowledge of how to utilize UDL was essential to all teachers (Jimenez et al., 2007; Lopes-Murphy, 2012; Pearson, 2015). Baldiris Navarro et al. (2016) argued that teachers required certain skills and abilities to address the needs and preferences of an increasingly diverse body of students to provide "equal educational opportunities" (p. 25). Researchers also found that even though the literature base for UDL was emergent, there was research which validated the use of the principles of UDL in teacher professional development to develop lesson plans that fostered

success (Baldiris Navarro et al., 2016; Kumar and Wideman, 2014; Pearson, 2015). Findings from previous studies were used to guide this researcher's decision to investigate the perceptions of instructional coaches in the district to understand the impact UDL training had on teacher pedagogy and lesson plan development.

Educator perceptions were the focus of many studies involving UDL. Many of these studies focused on perceptions of teachers at the postsecondary level; however, few focused on perceptions of teachers in K-12 public schools and no studies were found that focused on perceptions of instructional coaches. After thorough review of Google Scholar, Galileo, Proquest and EBSCO host databases, minimal research was found to inform this study. This study took place in a southwest Georgia public school system in which training in UDL was offered in multiple schools and teachers were now in the implementation process. In order to inform this study the researcher located research that took place in K-12 schools and focused on faculty perceptions of UDL (See Table 2).

In 2010 Wyndham completed a statewide study to investigate the perceptions of K-12 public school faculty members at various stages of UDL implementation. To determine if differences existed in faculty who completed UDL training, those currently participating in UDL training, and those who had no UDL training, Wyndham used an exploratory mixed methods research approach. Although Wyndham's study focused on faculty perceptions of students with disabilities' inclusion in general education classes and technology utilization to differentiate instruction, the faculty perceptions of student engagement were of interest for the current study. Wyndham used the Statistical Program for the Social Sciences (SPSS) software to generate descriptive and comparative analysis of the quantitative survey data and qualitative analysis was completed for the open-ended survey question. Results indicated faculty trained in UDL

perceived an increase in student choice results in increased student engagement (Wyndham). Although participants in all groups agreed more choice leads to higher levels of student engagement, there was a significant difference in those with UDL training strongly agreeing while those with no UDL training merely agreed with the correlation. Results also indicated faculty trained in UDL perceived strategies useful for students with disabilities were useful for all students; study findings noted a significant difference between those with UDL training and those with no UDL training. The open-ended survey question revealed faculty concerns over UDL implementation. Common themes reflected concerns about time required for implementation, technology utilization, and requests for ongoing professional development and modeling (Wyndham).

Marylou Hatley conducted a study in 2011 to analyze teacher perceptions of how UDL affected their teaching and planning. Hatley completed a two-part mixed methods study in a single school district from a Midwestern state. Part one consisted of classroom observations and teacher interviews while part two consisted of a levels of concern questionnaire and a survey of UDL principles utilized in the classroom. Teachers who were interviewed understood the benefits of UDL, felt that UDL had influenced their vision of education, and felt UDL influenced the process of teaching and learning in their classrooms, helping to sustain student interest and inspire unmotivated students to participate in lessons and activities. Administrators interviewed felt UDL was not represented in all classrooms and felt teacher buy-in was key for systemic implementation (Hatley).

Although teachers expressed the ability to create lesson plans which include the UDL principles and felt UDL designed lessons helped cultivate student interest, Hatley (2011) found teachers to be unsure how to implement UDL principles in the classroom and indicated the need

for continued support after training. Hatley found a significant difference in teachers with more UDL experience when compared to those just starting to implement UDL. Teachers with more experience felt UDL had a larger influence on their pedagogy than those teachers with less experience with UDL. Findings also indicated that UDL principles were evident in the classroom; however, collaboration time, access to technology, and ongoing support were concerns for teachers and teachers felt these supports were required to effectively implement UDL principles in the classroom (Hatley).

Meier (2013) studied through survey and interview methods, instructional strategies being utilized by teachers and how they correlated to their knowledge of UDL. Kindergarten through twelfth grade public school teachers from a single Midwestern state were surveyed to collect data on teachers' self-reported use of instructional strategies that aligned with UDL principles and teachers' self-reported knowledge of the principles of UDL. The 56 survey participants representing 5 districts from across the state answered both open-ended and close-ended questions including frequency, multiple choice, Likert scale, and short answer style questions. Four of the 56 participants agreed to participate in a 25-35-minute, six section interview Meier used to gather a deeper understanding of participant use and knowledge of UDL and UDL strategies.

Meier (2013) used SPSS software to analyze the quantitative data and a combination of Microsoft programs, Excel and Word, to analyze the qualitative data. Meier found teachers used the UDL principles of multiple means of representations and multiple means of action and expression more than multiple means of engagement particularly for those with a low level of UDL knowledge. Teachers with a higher level of UDL knowledge reported more variance in levels of challenge included in classroom activities. Meier explained how important this finding

was as it related to Vygotsky's ZPD where deeper learning took place. When compared to general education teachers, special education teachers reported a higher use of the UDL principle for providing multiple means of action and expression, particularly scaffolding assignments. Meier explained that this might be due to college coursework for special education teachers focusing on adapting material for students with disabilities.

Researchers indicated that strategies implemented might be strategies that supported UDL principles; however, these strategies were not used with the intention to implement UDL in the classroom. Meier (2013) found that the strategies mostly used by participants in the study were more aligned to a teacher-centered classroom rather than a student-centered classroom. Teachers utilized multiple ways to present the information, but lacked ways for students to facilitate and monitor their own learning. This finding suggested that even though teachers knew they needed to use the principles of UDL, they fell back on strategies most comfortable to them and easy to implement. Meier reported that overall, teachers had a working knowledge of UDL and thus the use of instructional strategies aligned with UDL was not due to a focused implementation of UDL. She suggested the need for professional development for practicing teachers to allow time for training, practice, and reflection on UDL implementation.

In 2016, Jordan Anstead conducted a study in one school serving students with low incidence disabilities in grades 3-11. This qualitative study consisted of open-ended survey questions, individual interviews and group interviews. Jordan Anstead gathered and organized data from 20 online surveys, seven individual interviews, and one group interview of three participants. Based on the data, knowledge, willingness to implement, and perceived barriers were recurring themes in this study.

Results indicated an overall lack of knowledge of the UDL principles and a pervasive resistance to change. Jordan Anstead (2016) found overall impressions of the framework itself were negative, even for teachers with little knowledge of UDL. The responses indicated an overall self-focus in teachers resulting in concerns over how UDL inconvenienced teachers rather than how UDL was used for inclusive instruction. Teachers expressed concern about the amount of time necessary to implement the framework into practice, increase in supervision required with student technology use, and stress that resulted from this extra time and effort. Teachers felt they were already differentiating instruction and saw UDL as just another differentiation model that did not need to be implemented.

Common themes from these four studies indicated that UDL was incorporated into lesson plans, but was much more difficult to implement in the classroom. Teachers felt they need more training, support throughout the implementation process, time for collaboration, and easier access to technology. Researchers suggested administrative support and teacher buy-in, could be determining factors for successful implementation (Hatley, 2011; Jordan Anstead, 2016; Meier, 2013; Wyndham, 2010). The current study will analyze instructional coach perceptions of UDL and its impact on teacher pedagogy and will extend aspects of the studies by Jordan Anstead, Hatley, Meier, and Wyndham.

The researcher organized information from the before mentioned studies into a table format for quick referencing when drawing conclusions. The purpose, participants, research design, and outcomes of the four studies that most closely matched the purpose of the current study are explained in Table 2.

Theoretical framework

Since the early 1900s psychologists attempted to merge science with education to identify and explain some of the issues in education (Mayer, 1992). Progress was made over the last century in the way educational practices were studied. Mayer suggested that the scientific study of the educational process moved from the laboratory to studying the cognitive processes of students as they learned new material. UDL, rooted in neuroscience research, was an example of this transition.

Background

Universal Design for Learning (UDL) was one example of a framework for curriculum design that was influenced by several ideologies. The influence of poststructuralist ideals was evident in the way UDL took the focus from the material to be learned and placed the focus on the child and the way the child learned (Pinar et al., 2008). Deconstructivist ideals were seen in the way the UDL principles were broken down into guiding practices that had the student as the central concern. These ideologies had influenced the theory of constructivism, which impacted the creation of the UDL framework.

Constructivism was a cognitive learning theory based on cognitive psychology and focused on the learner making meaning of the material (Hewitt, 2006). Hewitt also explained that constructivists believed the processes of learning were created by the learner in an environment conducive to the learner. The learner disseminated information taken in and decided if the information was important enough to remember. Allowing learners to explore through cooperative, problem-based learning activities enabled cognitive change to take place (Slavin, 2012). UDL was based on this constructivist mindset, which has been influenced by several key players including Jean Piaget, Lev Vygotsky, and Howard Gardner.

Jean Piaget (1952) focused his studies on cognitive developmental stages of children. Piaget believed that children moved from one stage to another based on maturation and interactions with their environment. Piaget set age parameters for each stage, which could not be skipped, and sufficient time must be spent in each stage for development to take place. Piaget's theory of cognitive development led teachers to consider the child as the main focus of the learning process (Simatwa, 2010). Piaget also concluded that the pre-existing knowledge and past experiences of the child established the basis for how a child learned and understood new information and concepts (Piaget, 1959). The teacher considered what a student did and did not know about a topic, interests of the learner, achievements in the learning process, and instructional strategies most effective to each learner. Learning was a social endeavor that included the learner as the center of the process (Simatwa).

Like Piaget, Lev Vygotsky supported the child as the center of the learning and there were optimal age parameters for learning different material based on the mental development of the child (Vygotsky, 1935/1978; Vygotsky, 1935/2011). Contrary to Piaget, Vygotsky suggested that learning enabled development. He studied the mental level of the child as well as the child's ability to learn new material to create his theory of the Zone of Proximal Development (ZPD). A child's ZPD was "the distance between the level of his actual development, determined with the help of independently solved tasks, and the level of possible development, defined with the help of tasks solved by the child under the guidance of adults or in cooperation with more intelligent peers" (Vygotsky, 1935/2011, p. 204). Vygotsky explained the material to be learned coincided with the ZPD of the child so that the student was challenged but in a way not overly stressful to the student. This productive struggle allowed the child to create meaning from new experiences in an environment that was supportive, but not easy (Wyndham, 2010). Vygotsky suggested the

ZPD differed per child and the differences inherent in all children were embraced by the teacher as a way to keep children interested in learning (Vygotsky, 1935/1978; Vygotsky, 1935/2011).

Communication was a large part of Vygotsky's social learning theory which, suggested before the individual learner related to the material, ideas had to be formed and cemented in a social manner by explaining personal ideas and thoughts, listening to others views and ideas, and deciding if what the others say was valuable to making sense of the material (Vygotsky, 1935/1978). "Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with peers" (p. 7). As a child made meaning of his environment he internalized the learning which led to a change in mental development. According to Vygotsky, changes in mental development enabled other developmental processes. Due to learner variance, teachers encountered different developmental stages within one classroom and needed to provide material and activities to support multiple ZPD's. This led Vygotsky to a process Wood, Bruner, and Ross (1976) would later call scaffolding. Scaffolding, as defined by Wood et al., was a process where one mastered lower level skills before moving on to the next level; each level included supports that were gradually removed as the child progressed.

One struggle in the classroom was to keep students interested in the material to be learned. Use of the UDL framework included providing multiple means of engagement as one of its tenet principles with specific guidelines for "recruiting interest", a process which aligned with Howard Gardner's theory of multiple intelligences (Gardner, 1983). Gardner considered intelligence to be "the capacity to solve problems or to fashion products that were valued in one or more cultural setting" (Gardner & Hatch, 1989, p. 5) and included not only language and mathematical intelligence but also music, spatial, and body-kinesthetic intelligence to name a

few. The goal of recognizing individual personal strengths, and using them as a substructure for engagement and learning fit well into the UDL framework (Gardner, 2012).

UDL was a framework based on the constructivist mindset. In order to truly understand a concept, one must try to understand the concept from all angles, self-evaluate to determine when and where more knowledge was needed, and determine the best answers to questions (Rappolt-Schlichtmann, Daley, & Rose, 2012). "It is unrealistic for teachers to expect simple, step-by-step procedures guaranteed to work for all children in all situations" (Mayer, 1992, p. 405). Meyer et al. (2014) explained that the student's needs drove the learning, so the teacher needed to provide the student with the right tools to meet them where they were in the learning and bring them as close to the expected level as possible. The UDL framework addressed providing options for presentation and acquisition of material. Students needed to be able to create meaning while completing tasks that were scaffolded, interactive, and interesting so they were not bored or stressed. Setting goals and progress monitoring were included in the framework to address the strategic and affective brain networks. The cooperative aspect of learning that was important to constructivists (Smith & Throne, 2007), was also present in the UDL framework (Meyer et al.). Constructivism and the learning theories of Piaget, Vygotsky, and Gardner provided the underpinnings of the UDL framework in this study.

Summary

There have been many changes in education through the years. This was especially true for the population of students that required special services. Federal policy required the education of all children (Education for All Handicapped Children Act [EAHCA], 1975) in the least restrictive environment (IDEIA, 2004) in a manner conducive to the needs of most children

(NCLB, 2002). Universal Design for Learning was a framework promoted for use to inform decisions made when designing curricula to meet students' needs.

Universal Design for Learning enabled educators to consider all three learning networks when designing educational materials. Studies showed that UDL could be used to generate lesson plans to meet the learning needs of most students; many students enjoyed the options in materials and delivery methods that were common in UDL based instruction, and use of the UDL framework was beneficial to instruction.

Studies were conducted to investigate perceptions of UDL and the implementation of the framework in the classroom from a teacher point of view. Results of these studies showed that the majority of teachers were still in the learning process and needed more training. Teachers who were trained had positive perceptions of the framework although many studies exposed barriers to implementation such as time, support, and access to resources.

Many studies were completed in higher education; however fewer studies were conducted regarding the impact of UDL at the elementary and secondary level, with even less studies focusing on secondary level alone. For the purposes of this study the researcher proposed to investigate how UDL impacted teacher pedagogy and lesson planning practices by assessing the perceptions of instructional coaches of high schools in one southwest Georgia school district.

Table 2

Perception Studies: Universal Design for Learning and Teacher Pedagogy

STUDY	PURPOSE	PARTICIPANTS	DESIGN/ ANALYSIS	OUTCOMES
Jordan Anstead (2016)	Explore teacher perceptions of barriers to UDL implementation and application	20 certified teachers from 1 public charter school	Qualitative: survey, interview, focus group	• Lack of basic knowledge of UDL • Positive reaction to UDL overall • Negative perceptions regarding implementation • Barriers include time, resources, and training
Hatley (2011)	Describe perceptions teachers have during implementation of UDL	Qualitative portion: 9 practicing teachers 1 building level admin, and 1 district level admin Quantitative portion: 98 participants	Qualitative: observation interviews Quantitative: survey	Teachers felt: • The framework was used during lesson planning • Need help implementing the framework in the classroom. • Teachers beginning with UDL felt unsupported and used UDL less • Teachers experienced with UDL use it more and feel more supported
Meier (2013)	Teacher level of familiarity with UDL and UDL aligned strategies	56 K-12 public school teachers (survey) 3 follow up interviews	Mixed methods-survey, open ended survey, interview	• UDL principle 1 used most • Principle 2 used slightly more than principle 3 • Teachers are unfamiliar with

				the theory of UDL
Wyndham (2010)	Investigate faculty perceptions of how UDL training impacts school personnel	2466 Faculty members of 50 Indiana schools	Mixed Methods: survey with 1 open-ended question for qualitative analysis	• Supports research that UDL changes teacher practice • UDL training is important to general ed. teachers

CHAPTER III: METHODOLOGY

Introduction

The increase in different learning needs seen in 21st century classrooms generated a need for more diverse lessons and instructional strategies. Universal Design for Learning (UDL) is an instructional framework designed to help teachers create and implement lessons to reach all students (Rose & Meyer 2002). Based on ideas from architect Ronald Mace, UDL provided a framework that contained guidelines teachers used to consider all three learning networks of the brain when planning lessons. The proactive use of UDL enabled a wide variety of students to gain access to more material by providing multiple means of representation, action and expression, and engagement (Rose & Meyer).

Researchers described the implementation of UDL during lesson planning and instruction. Findings indicated that teachers included UDL in lesson planning (Baldiris Navarro, Zervas, Fabregat Gesa, & Sampson, 2016; Courey, Tappe, Siker, & Lepage, 2012; Goldthwait-Fowles, 2015; Pearson, 2015; Spooner, Baker, Harris, Ahligrim-Delzell, & Browder, 2007; Winter, 2016) yet implementation in the classroom was complicated (Jordan Anstead, 2016; Hatley, 2011; Meier, 2013). Teachers stated they needed more training, modeled instruction, and access to technology. The majority of teachers had a positive perception of UDL; however, the difficulty of implementation was voiced as a concern for many teachers.

Although the implementation process for UDL was a focus of many studies, minimal studies were found regarding perceived impact of UDL on teacher pedagogy and lesson planning though the lens of instructional coaches, thus this study contributed to the literature available on

this aspect of UDL. The purpose of this study was to gather instructional coach perceptions of the impact Universal Design for Learning (UDL) had on teacher pedagogy and lesson planning.

This study was conducted in a single South Georgia county where high school faculty participated in UDL training. A qualitative design was utilized to understand the experiences and perceptions of instructional coaches as they guided the implementation of UDL. Their perceptions were captured through semi-structured, face-to-face interviews which included questions regarding use of strategies, lesson planning, and knowledge of UDL. Through thematic analysis, data was analyzed for themes to shape the findings for this study (Johnson & Christensen, 2014). A qualitative descriptive study provided more in depth information on the impact UDL had on teacher pedagogy and lesson planning practices.

Research Questions

In order to determine if UDL impacted teacher pedagogy and lesson planning practices, the researcher used two research questions to guide the study.

1. To what extent do high school instructional coaches perceive UDL has influenced the teacher pedagogy of teachers in a southwestern Georgia county?
2. To what extent do high school instructional coaches perceive UDL has influenced the lesson planning practices of teachers in a southwestern Georgia county?

Research Design

A qualitative approach was chosen to get an in-depth view of UDL implementation and impact using the stories and experiences of the instructional coaches. Teddlie and Tashakkori (2009) suggested providing narrative data provides a more in-depth look into the concept being studied and Patton (2002) supported using a qualitative approach when the researcher wanted to tell the story using specific participant experiences. To provide a true understanding of the

impact UDL had on teacher pedagogy and lesson planning practices, the researcher needed to gather data rich with details. The experiences and perceptions necessary to answer the research questions could not be gathered using quantitative measures. Utilizing the experiences provided by the participants, the researcher used qualitative research methods to examine these experiences to develop patterns and relationships, in order to make meaning from their experiences; the experiences and processes from instructional coaches shaped the findings of this study (Creswell, 2009).

To answer the research questions, the researcher used qualitative data to reveal the perceptions and thoughts of the instructional coaches. Through semi-structured interviews, instructional coaches explained their perceptions of the impact UDL had on teacher pedagogy and lesson planning practices. The qualitative data were organized into a spreadsheet based on emerging themes. Findings were analyzed using thematic techniques to better understand the research findings (Teddlie & Tashakkori, 2009). These techniques included assigning information to categories based on identified codes, using those codes to determine relationships among and between the codes identified, and grouping these related codes into themes for comparison and analysis (Johnson & Christensen, 2014; Miles & Huberman, 1994). Results from the current study were compared to results from previous studies to determine trends in data.

Population

Each year students in Georgia were assessed in various courses and compared to other students across Georgia. Schools whose students scored in the lowest 5% on these state achievement assessments were designated as priority schools by the Georgia Department of Education (GaDOE, 2015a). Three high schools, in the southwest Georgia district being studied, were designated as priority schools in 2012 (GaDOE, 2014) one of which was previously

identified in 2010 as one of the 40 lowest achieving schools in the state in a Race to the Top grant (Shearer & Rauschenberg, 2012). To remove the priority school designation, student achievement needed to improve.

To improve student achievement schools in the southwest Georgia district being studied applied for and were awarded the School Improvement Grant (SIG). In 2011 the first of three district high schools, from the southwest Georgia school district in which this study took place, were awarded a SIG from the GaDOE. Over the following three years, the other district high schools also received SIGs. Each grant provided funds, professional development, and support intended to improve student achievement (GaDOE, 2015b; GaDOE, 2015c).

To reduce barriers to education for the students in the district being studied, teachers needed to be able to plan and implement lessons intended to reach all students. All three high schools in the study chose to provide professional development in the area of UDL, considered by the GaDOE as "an essential component in providing for students with disabilities, English language learners, and low-achieving students to achieve success" (GaDOE, 2011, p. 25).

To answer the research questions, the researcher needed to gather data from participants who served as instructional coaches for teachers going through UDL training and implementation. The district was chosen due to UDL training that took place in the district high schools between 2013 and 2017. The target population for the interviews included high school instructional coaches currently employed in the identified southwest Georgia school district. Although the Southwest Georgia district where the study took place serves students kindergarten through twelfth grade, only those schools who had faculty trained in UDL were included in this study. UDL training did not include faculty at the elementary or middle school level, thus only high schools in the district were asked to participate in this study.

At the time of UDL training, there were four high schools in the district. Due to low enrollment the high schools were rezoned, eliminating one of the four high schools, which left only three high schools in the district. Teachers from closed school, which had completed faculty wide training in UDL, were redistributed to the remaining schools in the district. Teachers with varying levels of UDL training were employed in all district high schools creating a population conducive to the current study. High school instructional coaches had the opportunity to work with all teachers in their building, giving instructional coaches the opportunity to interact with teachers at varying levels of UDL knowledge and training. Interviewing all high school instructional coaches in the district allowed for data to be gathered about the visible impacts UDL had on teacher pedagogy and lesson planning practices.

To provide information pertinent to the current study, the researcher set the following criteria for participants: 1) Participants were instructional coaches in a high school setting, 2) high school faculty had varying degrees of UDL knowledge, and 3) the high schools existed in the district being studied; this meant all of the instructional coaches from all district high schools were included in the study. This purposive sampling technique ensured that participants were able to answer the research questions and add to the study (Johnson & Christensen, 2014; Maxwell, 1997; Miles & Huberman, 1994).

Twelve instructional coaches were identified as meeting the criteria and were chosen to be part of the population for this study. Due to the small size of the population and the ability to easily reach the participants for the interview, the researcher chose a comprehensive sampling technique (Maxwell, 1997) to invite instructional coaches from district high schools to participate. Comprehensive sampling meant that all relevant cases were included in the study

(Johnson & Christensen, 2014). This method increased the representativeness of the population because all members were included in the study (Johnson & Christensen).

Participants

Across the district there were three public high schools employing 412 faculty and staff serving 3811 students in grades 9-12 (GaDOE, 2017). A request to participate in the study was sent to principals from all three district high schools. Principals were asked to consent to the study being conducted in the school they served and to digitally sign a consent form consenting to contact with school instructional coaches by the researcher. Once permission was granted, the researcher emailed the instructional coaches to request participation in the study. The email included the interview protocol and the informed consent form as attachments and requested the instructional coach reply to the email if they agreed to be part of the study.

Instructional coaches who agreed to be interviewed were directed to reply to the email with a proposed date, time, and location of the interview. If the requested time was unable to be accommodated by the researcher, the researcher replied with an available date and time. On the designated date and time, the researcher presented the instructional coach with a printed copy of the informed consent form and the interview protocol for the instructional coach to sign. Consent forms were stored in a locked filing cabinet belonging to the researcher and after one year lapsed, were destroyed.

Participation in the study was expected to be high, because the topic was current and relevant to expectations of practicing teachers and instructional coaches. The research findings could potentially influence professional learning and the implementation of UDL in high school classrooms. Although there was no incentive offered for participation, findings from the study

could influence support from instructional coaches and professional learning opportunities offered in UDL.

Procedures

A meeting was scheduled with the superintendent of the county where the study took place. During the meeting the researcher briefly explained the study and gained preliminary verbal consent for research to take place in the district. The researcher sent the superintendent and email, prior to the start of the study, containing information about the study topic and copy of the letter of cooperation, as well as a copy of the informed consent for school principals and instructional coaches (See Appendix A). The researcher provided a copy of the interview protocol (See Appendix B) to the superintendent and explained the intent of the study.

Once permission was granted and consent was obtained from the superintendent (See Appendix C), the research pursued approval from the Internal Review Board (IRB) of Columbus State University. Once IRB approval was obtained (See Appendix D), the researcher used district emails to contact the principals of each high school in the county. In the email, the researcher introduced herself, provided information about the purpose of the study, and attached a copy of the interview protocol. The principal was also requested to digitally sign the letter of consent by designating they agreed to the study.

If the principal disagreed, they were directed to exit the form, the response was recorded, and the school's instructional coaches were not included in the study. Principals that did not respond were sent a duplicate email three days later. If there was still no response the principal was contacted by telephone as a final attempt to include the school's instructional coaches in the study.

Once permission was granted and consent was obtained to conduct the study from principals, instructional coaches were contacted via the researcher's Columbus State email. The researcher briefly explained the purpose of the study, its intended uses, and asked that instructional coaches, who agreed to be part of the study, reply to the email with a proposed place, time, and date for the interview. The researcher attached a copy of the interview protocol questions and the informed consent form for the instructional coaches to preview before agreeing to participate.

Instructional coaches were reminded of the interview opportunity on three separate occasions to increase the survey response rate. The initial participation request was sent, a follow-up email was sent three days later reminding possible participants to sign up for the interview, and a final reminder email was sent an additional five days later.

Instrumentation

The semi-structured interview allowed for a deeper understanding (Johnson & Christensen, 2014) of the instructional and planning practices utilized by district high schools and to determine if UDL influenced those practices. The interview protocol consisted of an outline of the topics to be discussed and sample probing questions. During the interview the researcher "decided the sequence and wording of questions" (Johnson & Christensen p. 230). This format allowed for a conversational feel while increasing comprehensiveness of the topic by utilizing the outline in the interview protocol. If the researcher utilized the items in the interview protocol, the results were somewhat organized, making analysis easier (Johnson & Christensen; Miles & Huberman, 1994).

Within the email instructional coaches were informed that a consent form was to be signed at the time of the interview. They were not required to return the informed consent form

via email. The email included directions for the instructional coach to reply with contact information and a proposed date, time, and location for the interview to take place. At the scheduled time for the interview, the instructional coach was given the informed consent form to sign prior to the start of the interview. Interviews took place after school hours lasting an estimated 30-45 minutes.

Interview Process. The researcher conducted the interview using the interview protocol questions. Interviews were conducted face to face and started with the researcher reminding the interviewee of the components of the informed consent form, with special emphasis on confidentiality. The interview consisted of five multi part questions, modified from a study by Barbara Meier (2013). Participants answered questions intended to demonstrate the instructional coach's level of understanding of UDL, gather information regarding instructional practices aligned with UDL principles that were implemented by teachers with whom they worked, to reveal the methods utilized to plan for diversity in the classroom.

The first question was meant to give the researcher an idea as to the level of knowledge the instructional coach possessed around UDL in general. The instructional coach was asked "What do you know about UDL?" with several probing questions such as "What is the purpose of UDL?", "What are the pros and cons?", and "Would you recommend UDL to other teachers? Why or Why not?" The semi-structured interview guide approach chosen for this study allowed the researcher to include additional questions that arose based on interviewee responses (Johnson & Christensen, 2014; Teddlie & Tashakorri, 2009). While the planned questions were meant to be used to guide the interview, there were some questions that arose from the conversation that the researcher choose to include.

Question two was used to better understand the experiences the instructional coach had with UDL. Questions such as “How did you hear about UDL?”, “How long have you worked with UDL?”, and “What is the expectation for utilizing UDL at your school?” were included as follow-up items to get a deeper understanding of perceptions in general. In the third question, the researcher intended to gather perceptions of the UDL aligned instructional practices of the teachers by asking, “Do the teachers you work with use the principles of UDL?” followed by probing questions such as, “What percent of the teachers, in the school where you work, are knowledgeable of UDL?”, “Describe a typical classroom, at your school, where UDL principles are used.”, “Describe how UDL impacts teacher practice.”, and “Have there been any differences (instructional or behavioral) you have noticed, in the classroom, that you would say are a result of implementing UDL?” These questions helped reveal the instructional practices, instructional coaches perceived, to be most impacted by UDL as well as what those practices looked like in the classroom.

Question four was used to determine the use of specific UDL principles within classrooms at each school. This helped the researcher determine if instructional practices were influenced by UDL or if teachers just used these practices without having had training. The overarching question, “How are the guiding principles of UDL utilized in your school?” were followed up with more specific questions such as, “When your teachers present lessons to their class what are some of the strategies they use to address the diversity of the students they teach?”, “Do your teachers offer a variety of assignments? If so what types; if not, why not?”, “Do your teachers offer students a choice of materials/content/assessment? If so, which do they offer most often; if not, why not?”, and “Describe processes teachers in your building use to help students be self-directed learners”.

The last question, “When planning lessons how do your teachers plan for the diversity of students in the classroom?” was meant to help the researcher get a picture of the lesson planning process at each location. This question was followed by probing questions such as, “Has there been any difference you have noticed, in lesson planning, you would say are a result of implementing UDL?”, “How do teachers in your school utilize UDL during planning?”, “Describe the process, teachers in your building follow, to plan for diversity of students.”, and “What is the process for collaborative planning in your school?”

This information was recorded, using a digital voice recorder, to increase accuracy during transcribing the interview responses. Digital recordings were kept on a password-protected device in a locked filing cabinet until time of transcription. The transcription was sent to the interviewee to check for accuracy. This process of member checking increased the credibility of the interview data (Teddlie & Tashakkori, 2009). Once the recordings were transcribed and verified by the interview participant, the recordings were deleted permanently from the recording device. Transcriptions will be kept on a password protected external hard drive in a locked filing cabinet for no more than one year, and then deleted.

Data Collection

Once approval to conduct research was obtained from the IRB from Columbus State University, the researcher sent a request to participate in the study to principals from all three district high schools. A copy of all interview items was included in the email as an attachment and the email ended with a link to the web-based informed consent form where principals agreed and entered their email as a digital signature or disagreed and exited the form.

Results from the informed consent form were automatically collected in a Google sheet. Instructional Coaches of schools whose principal agreed with research being conducted in their

building, were contacted using the district email list. Instructional coaches of schools whose principal disagreed with research being conducted in their building, were removed from the list of possible participants.

Each interview was recorded, using a digital voice recorder, to increase accuracy during transcribing the interview responses. This process helped ensure accuracy and eliminate the chance of the interviewer missing information or prolonging the interview while trying to transcribe the interview as it happens (Teddlie & Tashakkori, 2009). Digital recordings were kept on a password protected device in a locked filing cabinet until time of transcription. The transcriptions were sent to each interviewee to check for accuracy and verification in a process called member checking (Johnson & Christensen, 2014). The transcript did not include any information that might be used to identify the interviewee. This process of member checking increased the credibility of the interview data (Teddlie & Tashakkori).

Once transcriptions were verified, the researcher analyzed each transcription and segmented (Johnson & Christensen, 2014) or unitized (Teddlie & Tashakkori, 2009) the data. This was done by dividing the transcript data into pieces of meaningful information (Johnson & Christensen; Miles & Huberman, 1994; Teddlie & Tashakkori). This was done by copying sections of the transcription and pasting the information into a Google sheet. Items were given a code, identified by the researcher, to aid the researcher in later analysis. Coding, according to Johnson and Christensen, was the process where the researcher assigned a symbol, description, or title to each segment of information identified during transcript analysis.

The final step was to use the filtering and sorting functions in Google sheets to organize the data into common categories and themes. These categories and themes were used to describe the qualitative data and draw conclusions based on the findings.

Response Rate

Teddlie and Tashakkori (2009) explained that sample sizes in qualitative research depended on many factors; however, to increase representativeness, saturation was the guideline for a qualitative sample. This meant that additional participants produced no new information and all possible perspectives were represented, generally between 18 and 32 interview participants (Teddlie & Tashakkori). Based on information found on the district website there were 12 high school instructional coaches employed in the district in which the study took place. Using the comprehensive sampling technique described by Johnson and Christensen (2014), the researcher emailed information regarding the current study to the total population of approved high school instructional coaches due to the small size of the population.

Data analysis

Qualitative measures were used to evaluate instructional coaches' responses to interview questions. Once the interview transcripts were verified by the interviewee, the researcher segmented each transcript. This process involved the researcher analyzing each part of the transcript looking for key words and phrases used to group responses. Each segment was copied and pasted into a spreadsheet and given an identifier that briefly described the content of the segment. Each segment was labeled with the participant interview number to aid the researcher in describing the data.

Once all transcripts were segmented and identified, the sorting functions in the spreadsheet were utilized to arrange topics with similar meanings together. The researcher used the sorted information to further analyze each identifier to ensure all responses for a certain topic were organized together. The researcher looked for common themes in the data and sorted the responses into more specific categories when necessary. The sorted data was used to draw

conclusions to answer the research questions in this study as well as compare to findings from previous studies.

Reporting the data

Qualitative data were reported according to the themes identified during data analysis and used to further explain findings from this study as well as compare to previous studies. The qualitative findings were displayed in tables and explained narratively. Findings were compared to other similar studies as a cross reference of results to "clarify the conclusions" (Johnson & Christensen, 2014, p. 633) made from the findings. All interview questions were modified from the 2013 study by Meier; however, results from several other studies (Hatley, 2011; Jordan Anstead, 2016; Wyndham, 2010) were also used for comparison. This enabled the researcher to draw conclusions based on the combined data.

The Research Confirmation table (Table 3) cross referenced the major studies mentioned above with the interview questions and the research questions the researcher used for the current study. Each interview question was given a designated topic for better organization. Once interviews were segmented and coded for analysis, the researcher used Table 3 to compare results across four different studies. Although the interview items were modified based on the 2013 Meier study, findings from the other three studies were also used to help answer the research questions.

As noted in Table 3, the researcher made an analysis of the study's research question and compared them to previous studies.

Summary

The researcher completed a qualitative study to determine instructional coach perceptions of the impact of UDL in the proposed district in southwest Georgia. The target population was

composed of instructional coaches from all district high schools due to previous training that took place in these schools between 2013 and 2017. Using interview protocol questions adapted from a previous study completed by Meier in 2013, the researcher gathered data on the level of UDL knowledge and the inclusion of UDL aligned instructional practices to determine the impact UDL had on teacher pedagogy and lesson planning practices. Interview data from instructional coaches was compared to determine emerging themes and draw conclusions.

The qualitative interview data was analyzed, segmented, coded, and organized into categories or themes to further investigate perceptions of instructional coaches. These data were organized into tables and graphs and synthesized to determine an overall impact of UDL that was then compared to previous studies.

Table 3

Research Confirmation Table

Topic	Research Question (RQ)	Current Interview Protocol	Meier, 2013	Hatley, 2011	Jordan Anstead, 2016	Wyndham, 2010
UDL Knowledge		Q1	Q5, Q7, Q8	Teacher Q1, Q5, Administrator Q2	Q1, Q3	
Experience with UDL		Q2	Q6 Survey p. 11 and 12	Teacher Q7		
Staff knowledge and use of UDL	RQ 1	Q3	Q7, Q9, Q14, and Q19 Survey p. 12		Q2, Q4	
Utilization of UDL guiding principles	RQ 1	Q4	Q15, Q16c, Q17c Survey p. 5, 6 and 7 open-ended items	Q3, Q4 Survey 10 and 11		Survey 9
Utilization of UDL during lesson planning	RQ 2	Q5	Q4, Survey p. 4 and p. 9 open-ended item	Q2 Survey 12 - 15		

Note: All interview questions were modified from the Meier (2013) study *Strategies that teachers implement to help students access the general education curriculum: Investigating the instructional strategies of universal design for learning.*

CHAPTER IV: RESULTS

Introduction

Since the late 1990s, Universal Design for Learning (UDL) was an increasingly influential part of public education (Hall, Meyer & Rose, 2012). UDL was a proactive framework for designing curriculum that minimized barriers for all learners (Rose & Meyer, 2002). By identifying obstacles to learning and developing a plan to overcome the obstacles, teachers gave more students full access to a quality education (Rose, Hasselbring, Stahl, & Zabala, 2005).

While involved in a government funded grant for school improvement, high schools in one southwest Georgia school district were encouraged to utilize UDL. For teachers to utilize UDL, professional learning took place to train teachers on how to use the framework. Leaders from three of the four district high schools provided faculty-wide training in UDL. The purpose of this study was to investigate the perceptions of high school instructional coaches about the impact of UDL training on high school teachers in one southwest Georgia school district.

The researcher chose a qualitative descriptive study to get an in-depth look into instructional coaches' perceptions of the impact UDL had on teacher pedagogy and lesson planning practices. As instructional support to teachers and those in charge of professional learning for the school, the perceptions of instructional coaches were particularly beneficial in helping understand the impact of UDL on teacher practice. Through individual face to face interviews of instructional coaches from each high school in the southwest Georgia school district, the researcher gathered qualitative data used to better understand the impact of UDL.

Research Questions

The researcher used two research questions to guide the study in order to determine if UDL impacted teacher pedagogy and lesson planning practices.

1. To what extent do high school instructional coaches perceive UDL has influenced the teacher pedagogy of teachers in a southwestern Georgia county?
2. To what extent do high school instructional coaches perceive UDL has influenced the lesson planning practices of teachers in a southwestern Georgia county?

Research Design

A qualitative design was utilized to explore the perceptions of instructional coaches serving in district high schools in the southwest Georgia school district. First, the researcher gained permission from the superintendent of the district to conduct the study within district high schools. Once permission was granted from the superintendent the researcher applied for permission to conduct the study and received approval from the Internal Review Board (IRB) of Columbus State University (See Appendix D). Principals serving in high schools in the southwest Georgia district were contacted via email to gain permission to conduct the study with instructional coaches. The email contained a brief explanation of the study as well as a link to the electronic consent form. Principals who agreed to the study being conducted in their school site agreed to the study by clicking the "I agree" box and entering their email address as an electronic signature. Once permission was granted by the principal, instructional coaches from the approved high schools were contacted by email to invite them to participate in the study. Reminder emails were sent on two separate occasions to increase participation. Instructional coaches who agreed to participate were interviewed. An electronic device was used to record each 30- to 45-minute individual face to face interview. The researcher used a semi-structured

interview protocol (See Appendix B) to gather instructional coach perceptions of UDL and the impact UDL has on teacher pedagogical practices.

The perceptions were gathered and organized using five general questions followed by more specific follow-up, probing questions. The first two questions presented to participants were meant to gauge the participant's level of understanding and knowledge of UDL. What do you know about UDL and What experiences have you had with UDL were questions that allowed the researcher to delve into the level of understanding, training methods, and underlying perceptions about UDL in general. Based on responses, participants were separated into one of four groups (See Table 4).

Table 4

Level of UDL Knowledge and Experience Groups

UDL knowledge and understanding group	Training and experience with UDL
High Level (HL)	>4 years+ research, courses, or workshops
Medium Level (ML)	1-4 years + research, courses, or workshops
Low Level (LL)	<1 year, research, courses, or workshops
Zero Level (ZL)	No training or experience

As reflected in Table 4, teachers with four or more years of training and experience with UDL were placed in the High Level (HL) group. Those with one year of training plus courses, classes, or independent research up to three years of training and work were placed in the Medium Level (ML) group. Those with no training, but have had a course in college or have read some articles up to one year of training were placed in the Low Level (LL) group. Finally, those with no training, no classes, and have had minimal exposure to UDL were placed in the Zero Level (ZL) group. Data was analyzed based on these groups.

The third question was to gauge specific UDL components used in the classroom and the fourth question gauged use of the underlying principles of UDL even though it was not specifically classified as UDL. Data from the two questions were used to answer research question #1: To what extent do high school instructional coaches perceive UDL has influenced the teacher pedagogy of teachers in a southwestern Georgia county?

The final interview question was used to better understand how teachers in each school plan for student diversity. Data from this question was used to answer research question #2: To what extent do high school instructional coaches perceive UDL has influenced the lesson planning practices of teachers in a southwestern Georgia county? During individual face to face interviews, participants answered the five overarching questions along with a series of probing sub questions.

After each individual face to face interview the interview recording was transcribed and sent to participants for member checking. Last, the researcher used qualitative data analysis techniques; data reduction, segmenting, and coding, to analyze, organize, and display the data (Johnson & Christensen, 2014; Miles & Huberman, 1994). Data was organized, analyzed, and reported based on research questions.

Demographic Profile of Participants

The southwest Georgia district utilized for the study included three high schools. Historically in the district, there were four high schools but due to low enrollment, the district was rezoned to include only three high schools. Three of the original four high schools held faculty wide training in UDL. One of the schools was eliminated in the rezoning and the teachers were redistributed throughout the district. To get a clear picture of UDL's impact in district high schools it was important to include instructional coaches from all high schools. This created a

total population of 12 high school instructional coaches for the district. This study included responses from eight of the twelve (66.7%) instructional coaches representing 100% of district high schools.

To maintain confidentiality participants were named, but were given a numerical designation. The district high schools were also given a numerical designation. Demographic information of participants including backgrounds, years of experience, and levels of experience with UDL were presented in Table 5.

Table 5

Demographic Profile

	Participant							
	1	2	3	4	5	6	7	8
UDL Experience Group	HL	ML	HL	LL	ZL	HL	ML	ML
Experience in Education	10 years	22 years	27 years	12 years	22 years	11 years	18 years	13 years
Education Background	Math	ELA	Science	Social Studies	ELA	Science	Social Studies	Science

As reflected in Table 5, demographic information included participant data that reflected experiences with UDL, and educational background information classified by subject areas. All participants had 10 years of experience or more, two participants had a background in ELA, one in math, three in science, and two in social studies. Interview participants included instructional coaches from all district high schools.

Participant 1 had a background in Mathematics and ten years of experience in public education. Participant 1 served as math instructional coach and was trained in UDL in 2013. He was responsible for leading training and monitoring implementation of UDL training for the

faculty. UDL was still utilized and emphasized in his school although the professional learning focus changed.

Participant 2 had 22 years of experience in English, Language Arts education at the middle and high school level and served as the literacy instructional coach. As literacy coach Participant 2 was responsible for planning, implementing, and monitoring professional learning in the school. The focus of PL at the school was UDL before Participant 1 became the instructional coach. UDL training continued and six months of her time as a literacy coach was spent planning, implementing, and monitoring UDL. UDL was no longer a professional learning focus for the school, but was still utilized and emphasized in her school site.

Participant 3 had 27 years of experience in public and private education. Participant 3 had a science background as well as experience as school improvement specialist and instructional coach. Participant 3 was tasked with planning, implementing, and monitoring professional learning for her location. UDL was a focus for 5 years in the school in which Participant 3 served as instructional coach and, although UDL was no longer a focus it was still utilized and emphasized in the school site.

Participant 4 had a background in the social sciences, 12 years of experience in education, and currently served as the social studies instructional coach. Although Participant 4 had no official training in UDL, it was a focus during education courses Participant 4 took in college and read about UDL in scholarly articles. UDL was not a focus of professional learning at the school site; however, many of the teachers at the school site were trained in UDL.

Participant 5 had a background in English, Language Arts education and served as literacy instructional coach after 22 years as a classroom teacher. Participant 5 had no training or

courses in UDL, but heard of UDL in peer discussions. Many teachers in the school site had training in UDL, although it was not a focus of professional learning.

Participant 6 had 11 years of experience in science education at the high school level and currently served as instructional coach over all departments. As instructional coach, Participant 6 was responsible for planning, implementing, and monitoring professional learning. UDL was a focus for faculty wide professional learning at the school in 2014. Due to a change in leadership, UDL was not a current focus and many of the teachers trained in 2014 changed locations and now served in other schools and school systems. UDL was still utilized, but not emphasized at this school.

Participant 7 had 18 years of experience in social studies education and served as the social studies instructional coach. In 2015, UDL was the focus of faculty wide professional learning. Training and support was not continued after 2015 as the school leaders were unhappy with the level of implementation and chose to pursue other professional learning opportunities. Many of the teachers trained in 2015 changed positions and served in other schools or school systems. The remaining faculty did not utilize UDL as a framework, but still utilized some of the strategies learned during training.

Participant 8 had a background in science education with 13 years of experience at the high school level and currently served as the science instructional coach. Participant 8 helped plan, implement, and monitor faculty wide training in UDL that took place in 2015. Due to changes in the focus of professional learning, UDL training and support was no longer emphasized after 2015 at the school. Due to a large turnover in the school faculty, many of those trained in 2015 no longer served in this location. Although UDL was no longer a focus, the strategies and planning process learned during UDL training were still being utilized.

Findings

To determine if instructional coaches perceive UDL impacted teacher pedagogical practice two research questions were used: (1) To what extent do high school instructional coaches perceive UDL has influenced the teacher pedagogy of teachers in a southwestern Georgia county? and (2) To what extent do high school instructional coaches perceive UDL has influenced the lesson planning practices of teachers in a southwestern Georgia county? The researcher used a spreadsheet to analyze, reduce, and segment (Johnson & Christensen, 2014; Miles & Huberman, 1994) the data gathered from each interview question. The data was then coded by color and organized by emerging themes.

Organization of Findings

During data analysis several themes emerged. These themes were organized based on research question and presented using summary tables followed with a narrative explaining how the table supports the research question. Additional findings were reported after the findings for each research question using a summary table followed with a narrative explanation.

Research Question 1

There were two interview questions that focused on the impact of UDL on teacher pedagogy. One question was used to investigate the use of specific UDL principles and one question focused on strategies teachers use that could be considered UDL strategies. While analyzing the data themes emerged relating to the impact UDL had on teacher pedagogy: (1) overall impact, (2) strategies used by teachers, (3) and implementation of UDL.

Overall impact. The majority of the participants reported a change in teacher pedagogy resulting from training in UDL (See Table 6).

Table 6

Impact of UDL on Teacher Pedagogy

Participant	Commentary
1	*UDL directly impacted the teacher, it allowed our veteran teachers to go back in their toolbox and start pulling those strategies they had in them but were not using.*
2	*Teachers did change their practices after the UDL training and their practice improved, both instructionally and behaviorally.*
3	*It [UDL] became a part of their practice, not something tacked on, but this is how I do it. The classes looked differently when you walked in the door because it wasn't everybody facing the teacher getting instruction. There was a lot more work that was team driven. The teacher was much more the facilitator in the actual instruction.*
4	*I think teachers are thinking about it [student diversity], but they may not think about it in the respect of the UDL.*
5	*I really don't know that there would be any difference, because to me UDL and differentiated instruction seem kind of the same.*
6	*Yes. I can [tell a difference]. Because, those that have had UDL training in the past, they're more comfortable reaching children different ways.*
7	*I don't see the difference, but we are looking for differentiation, so I guess it's [UDL] there, but it's not there, you know*
8	*I do say that the veteran teachers in those particular places where we have the multiple means of representations, multiple means of engagement on the lesson plan, they're able to plug strategies in there more easily compared to our new teachers.*

Five of eight participants (63%) reported a direct change in teacher pedagogy they considered to be a result of UDL training (See Table 6). Of 5 participants, 3 participants were in the high level (HL) group and two were in the medium level (ML) group when grouped by UDL knowledge and experience, as noted in Table 4. Participant 2 and 3 agree that UDL helped guide teachers in implementing a student-centered classroom saying *"It shifts the focus from teacher-directed to a more student-directed environment"* (Participant 2, 2018, p. 2) and *"It truly gives you a framework for student centered work that leads you to depth of knowledge"* (Participant 3, 2018, p. 5). Participant 1 (2018) explained that UDL impacted teacher pedagogy stating *"UDL*

allowed for teachers to have multiple, different materials available and ready for students who probably were not ready at that time to actually engage in that lesson" (p. 5).

Several participants reported a difference in student goal setting and monitoring of their own work. *"I recall when we did have UDL, I had a teacher that had the kids write the lesson plan. You tell us. You get your learning target and you write the lesson plan and what we're going to do and how we're going to learn it."* (Participant 6, 2018 p. 3). Participant 3 (2018) explained, *"The students were able to design, plan, develop, and monitor their own project following directives from the teacher"* (p. 7).

Participant 2 (2018) described a similar situation. *"One specific example involved a science lesson titled the kingdoms project. Students worked in small groups; they set goals, monitored progress towards meeting these goals, and reflected on the group's progress and their individual contribution to the task"* (p. 3).

Not all participants reported an impact relating UDL to differentiated instruction saying, *"I think teachers are thinking about it, but they may not think about it in the respect of the UDL."* (Participant 4, 2018, p. 4). *"Is it making a difference? I think that the practice of [DI] is making a difference"* (Participant 5, 2018, p. 4). *"I don't see the difference, but we are looking for differentiation"* (Participant 7, 2018, p. 4). The participants who did not see the impact were among the least trained with one participant in the medium level (ML) group, one in the low level (LL) group and one in the zero level (ZL) group.

Strategies used by teachers. Over half of the participants, representing all levels of actual UDL training (HL, ML, and LL), referenced a difference in strategies utilized by teachers as evidence of a change (See Table 7).

Table 7

Strategies Used by Teachers

Participant	Commentary
1	*It [UDL] just gives pretty much strategies on how to engage students. It got teachers to actually start utilizing more strategies and being more intentional about what you do. It did give us strategies to use to just pull from that teachers could actually employ. And so that's what UDL allowed, for the teachers to kind of look at their class and really put in strategies and supports in place to actually help support the students.*
3	*Teachers used specific examples of how UDL could be done in the classroom. It was a full page, just about a full page for every one of the UDL principles.*
4	*Teachers had a check-off list of strategies they could use. I definitely see various ways of getting out information. It used to be lecture, lecture, lecture, but I think teachers now, I see them trying to figure out different ways for kids to acquire information beyond traditional ways.*
5	*I see tangible text. I see videos. I see audios. Hands-on activities.*
6	*The consultant provide one resource, a list of strategies teachers could use to plan their lessons. This was very useful for the teachers. They do hands-on activities to try to engage the students with the lesson when they're introducing. They do a lot of vocabulary activities, matching, to try to teach vocabulary terms, create word walls. They like carousels and do some reading and writing assignments to incorporate literacy.*
8	*I do say that the veteran teachers in those particular places where we have the multiple means of representations, multiple means of engagement on the lesson plan, they're able to plug strategies in there more easily compared to our new teachers.*

As referenced in Table 7, Participant 1 (2018) described the faculty supported as *"utilizing more strategies and being more intentional about what you do"* (Participant 1, 2018, p. 4) and explained, *"UDL directly impacted the teachers and forced our veteran teachers to go back in their toolbox and start pulling those strategies they had in them but were not using"* (Participant 1, p. 4). Participant 8 (2018) suggested, *"The veteran teachers who had UDL training, they're able to plug strategies in there [lesson plans] compared to our new teachers"* (Participant 1, p. 4).

Participants also referenced resources provided during training that aided the teachers in choosing strategies to implement in their lessons (See Table 7). Participant 4 (2018) stated, *"You had a check-off list"* (p. 2), Participant 3 (2018) mentioned, *"She gave specific examples of how UDL could be done in the classroom. It was a full page, just about a full page for every UDL principle"* (p. 9). Participant 1 (2018) added, *"We were able to go through a list and kind of pick out what would work best"* (p. 6).

In addition to the increase in instructional strategies mentioned by five of the eight participants, specific strategies were mentioned repeatedly (See Table 8). Transcriptions were analyzed for mention of specific strategies utilized by teachers in the district. These strategies were recorded and tallied based on participant level of UDL knowledge. As noted in Table 8, those with a higher level of UDL knowledge provided more examples of classroom implementation than those with a lower level of UDL Knowledge.

Not all participants agreed that it was UDL that made the difference. One participant who did not perceive an impact on instruction said, *"I think teachers are thinking about it, but they may not think about it in the respect of the UDL."* (Participant 4, 2018 p. 4). Participant 7 (2018) stated *"What you're saying is going on is not a change in the instruction. We're just saying you're already doing this, so basically, you're already doing UDL, so what are we really gaining from it [training]?"* (p. 3). Participant 7 (2018) further explained saying:

> *Recommend it to teachers? No. Recommending some of the UDL strategies? Yes. I wouldn't present it to them as let's do UDL. I would say, okay, here's a strategy that we can use. I've found through this training that it is one of the UDL strategies. I would say we are trying to move to a level three in DI and these are some of the strategies that we can use, but present it as UDL, I would not do that.* (p. 2)

Implementation of UDL. Implementation of the UDL principles was a common topic during interviews (See Table 9). Even though the entire UDL framework was used in the planning process, the representation portion of the framework was most utilized in the classroom with the action and expression portion utilized slightly less. Participants expressed a concern with implementing the engagement portion, which was less emphasized in training and so not observed as much in classroom instruction.

Table 8

Frequency of Strategy Used

Strategy	Frequency Based on Level of UDL Knowledge			
	High Level	Medium Level	Low Level	Zero Level
Auditory	2		1	1
Carousel	1			
Choice	5	2	2	1
Choice board	6	2		
Collaboration	1			
Color contrast	5			
CPS/clickers	1			
Dim lights	1			
Draw			1	
Flexible grouping		3	1	
Goal setting	2	2	1	
Graphic organizer	5			
Hands-on/labs	2		2	
Leveled questions/ tiered activities		1	3	1
Manipulatives	1			
Music		2		
Model	1			
Oral	1			
Paper/essay	3			
Prezi/ Powerpoint	5	2	1	
Progress monitoring	4	2	1	
Project	4	1		1
Questioning	1			
Reciprocal teaching			1	
Rubrics	2			

Skit/Play			1	
Stations/ Centers		1	2	1
Teacher interaction/gradual release	2			
Technology	3	2	2	
Text sets	1		1	1
Underline text	1		1	
Variety	1	2		
Video	7		2	1
Vocabulary	1			
Word walls	2			

Participants described two of the three principles saying, *"The representation piece is just how to get kids to respond to the product that the kid actually does, and the different types of product that kids can use to express, whether it be a PowerPoint, orally, or a video. They can have an actual project, a paper."* (Participant 1, 2018, p. 1). *"It was multiple means of action and expression that was second to come along. That was where, you know, there was a lot of choice involved with the students"* (Participant 3, 2018, p. 3). The third principle, multiple means of engagement, was least mentioned of the three (See Table 9).

Participants representing all levels of actual UDL training and the zero level group discussed implementing the principles of UDL. As noted in Table 9, participants discussed the ease of implementing multiple means of representation saying, *"I think representation was most utilized"* (Participant 2, 2018, p. 3), *"Multiple means of representation, I think that's the one that really stuck with me."* (Participant 4, 2018, p. 2) and *"Multiple means of representation is definitely the easiest of the three to do"* (Participant 3, 2018, p. 3). Participant 1 (2018) suggested, *"I think both [representation and action and expression] were equally implemented"* (p. 3).

Table 9

Implementation of UDL Principles

Participant	Commentary
1	*I think both (representation and action and expression were equally implemented). One of them deals with how the teacher presented the information, and the other one was how the students are going to perceive that they actually learned it. Those two components were pretty much consistent. They were more easy for teachers to kind of respond to actually interpret*
3	*It was multiple means of action and expression that was second to come along. That was where, you know, there was a lot of choice involved with the students,*
4	*Looking at multiple means of representation, different ways you can present information. I know one of the rules of thumb is to look at three different ways that you can present information to students to ensure that it appeals to all learning levels or diverse levels.*
6	*Multiple means of action and expression includes more student efficacy, and giving them choices, they're more likely to be responsible for what you're asking them to do, and do the work.*

"It was multiple means of action and expression that was second to come along. That was where, you know, there was a lot of choice involved with the students" (Participant 3, 2018, p. 3). Participant 2 (2018) agreed stating, *"Choice was a big part"* (p. 3). *"Multiple means of engagement was kind of the next phase. I would say we really didn't get to the last one"* (Participant 3, 2018, p. 3). Participant 1 (2018) explained *"Engagement- That's the component that we kind of struggled with and needed some improvement on"* (p. 3) and Participant 5 (2018) agreed saying, *"I think that's probably the hardest part"* (p. 3).

Participant 6 (2018) reported that UDL does impact teacher practice explaining, *"Those that have had UDL training in the past, they're more comfortable reaching children different ways."* (p. 3). Being able to adapt to different types of learners in the same classroom is one of the benefits of UDL. *"The ability to meet the needs of students, that's the biggest impact"* (Participant 6, 2018 p. 3). Participant 4 (2018) explained, *"I see them [teachers] trying to figure out different ways for kids to acquire information beyond traditional ways. I do think they*

consider the struggling learners, and also in some classes they consider those gifted or more advanced learners." (p. 4). Also, *"Some teachers did change their practices after the UDL training and their practice improved, both instructionally and behaviorally."* (Participant 2, 2018 p. 3).

Research Question 2

When asked if UDL impacted the planning process 87.5% of the instructional coaches who participated (3 HL, 3 ML, and 1 LL) reported that a change had taken place (See Table 10).

Table 10

Impact of UDL on Teacher Planning

Participant	Commentary
1	*I think the planning [was most impacted]. Yes. It had more meat, more quality. That planning piece was very big. It got teachers to actually start utilizing more strategies and being more intentional about what you do.*
2	*I would say somewhat yes [impacted lesson planning]. Collaborative planning included use of template to guide planning.*
3	*The planning then began to be very specific in terms of how do we? What are the things I need to do in order to get this across to different students?*
4	*It makes you think about your instruction. You really have to be strategic in what you do, and I think that kind of weeds through a lot of the fluff.*
6	*We had a part on our lesson plan that said UDL. You had to show how you were implementing UDL into your lesson plan, at least three times a week*
7	*I would say when we were doing it, the process of planning had changed, but the implementation not so much. The planning part was better, but we still couldn't implement it the way it needed to be.*
8	*It's part of the lesson plan format that you're pretty much listing what strategies you're doing for each part.*

Table 10 includes commentary from participants particular to the planning process. Participant 7 (2018) concluded, *"The planning part was better"* (p. 10). Participant 1 (2018) explained, *"It had more meat, more quality."* (p. 3). Participant 3 (2018) described it by saying, *"It's not teacher planning. It's student planning."* (p. 4). Participant 8 (2018) added, *"The*

veteran teachers, with UDL training, are able to select strategies more easily than our new teachers" (p. 4).

All instructional coaches discussed a collaborative planning process where teachers meet anywhere from 1 day a week to 5 days a week and two-thirds of the schools utilize a lesson planning template that includes components of UDL; two themes emerged, time and support.

Time. A common theme when discussing lesson planning was the amount of time it took to effectively plan lessons that include UDL (See Table 11).

Table 11

Concerns Over Time Needed to Plan for UDL

Participant	Commentary
3	*Like I said, UDL, learning to be effective in UDL, it does take time. It's [UDL] uses an entirely different method of planning.*
4	*It's [UDL] good practice, but it depends on how you're expecting the teachers to go about doing it. If they can just do it and teach, sure. But if they've got to fill out a whole bunch of forms, and submit a bunch of stuff, then they take up all their time doing paperwork instead of the actual task of doing it.*
5	*But, I think it's hard for teachers to plan all of that. I don't know that it's so much of the planning of it [UDL] that's hard, but it's writing up the plan that is kind of a deterrent to the teachers.*
6	*It takes a lot of planning to use UDL effectively. UDL requires a lot of planning in advance, so if you're doing a tic tac toe activity, coming up with nine options can be stressful on the teacher, but once it's developed it is easier.*
7	*The amount of time that teachers are given to plan is a deterrent to implementation. I think the planning is major. If planning is not taking place, then it [UDL] can't be done effectively.*

Participant 6 (2018) suggested, *"A teacher has to be diligent in their instructional planning to be effective in UDL."* (p. 1). Participant 1 (2018) added, *"The planning piece was very big. It got teachers to actually start utilizing more strategies and being more intentional about what you do."* (p. 6). Another participant said, *"I think the planning is major. If planning is not taking place, then it [UDL] can't be done effectively"* (Participant 7, 2018 p. 1).

The increased amount of time for preparation and planning was mentioned as a negative aspect of UDL by five of the eight participants (See Table 11). Participant 6 (2018) stated, *"Teachers don't always like it [UDL] because it is more work on their part in the beginning"* (p. 1). Further, *"The amount of time that teachers are given to plan"* is a deterrent, according to Participant 7 (2018 p. 1). Participant 4 (2018) explained that teachers at her location are familiar with UDL and, for the most part, still implement the UDL framework during planning and instruction, they just don't want to document everything and Participant 5 (2018) described it as *"tedious"* (p. 3).

The two participants with the least amount of training, low level group and zero level group) discussed the amount of paperwork required to use UDL during the planning process. *"It depends on how you're expecting the teachers to go about implementing UDL. If they can just use the strategies and teach, I would recommend the UDL framework. But if they've got to fill out a whole bunch of forms, and submit a bunch of stuff, then they take up all their time doing paperwork instead of the actual task of creating the plan"* (Participant 4, 2018 p. 2).

Participant 5 (2018) described the planning and paperwork process as tedious explaining, *"I don't know that it's so much of the planning of it that's hard, but it's writing up the plan that is kind of a deterrent to the teachers. They'd rather just have the idea of what they're going to do and do it without having to spell it all out for somebody else to know"* (p. 3). *"I think the implementation of it, it probably could have been a little better to where it didn't overwhelm people, because there was a lot of paperwork attached to it"* (Participant 4, 2018 p. 3).

Support. The level of support during the planning process was also a repeated topic (See Table 12). Participant 1 (2018) described a process that was enforced at the school site. Teachers and coaches worked together during planning. One useful component of UDL utilized during

planning was a *"list of certain things that you could do with each UDL component"* (p. 4) provided by the consultant. Participant 1 (2018) explained:

> *The good thing about us [instructional coaches] is that we were part of the planning process, so we pretty much knew most of what was in the lesson plan because we actually helped write it, or we were at least there to ask questions about what they planned to do on Monday, Tuesday. Where's the assessment? It [UDL framework] did give us strategies to use to just pull from that teachers could actually employ. Okay, I want to teach this skill or this concept. How are we going to engage them? We were able to go through a list and kind of pick out what would work best for that particular concept with that teacher. During UDL training they provided examples of the engagement pieces, and the examples of the representation and Action and expression. It allowed us a platform to kind of ask questions and a resource for teachers who didn't have answers that we can go and just pull items.* (p. 4)

Participant 2 (2018) supported teachers through a similar process (See Table 12): *"All staff members were expected to implement UDL. Monitored by observations using walkthrough tools. Then we met afterwards as a department and feedback was given. Feedback was given directly to teachers using the walk through form and then there was a good opportunity to provide content specific feedback"* (p. 2).

Participant 7 (2018) described a different support process utilized in her location. *"There was a section in the lesson plans that the [instructional] coaches for each department did check. We did walk-through [observations] to see if the lesson plans were being followed. It was very general. It was very generic. We did have walk-through tools [observation forms] that*

everybody saw that we used and that we gave feedback on." (p. 3). Participant 6 (2018) described a similar process of checking lesson plans and observing classes (See Table 12).

Table 12

Level of Support During Planning

Participant	Commentary
1	*They [consultants] provided, pretty much, examples of the engagement pieces, and the examples of the representation and Action and expression. The good thing about us is that we were part of the planning process, so we pretty much knew most of what was in the lesson plan because we actually helped write it, or we were at least there to ask questions about what they planned to do*
2	*All staff members were expected to implement UDL. Monitored by observations using walkthrough tools. Then we met afterwards as a department and feedback was given.*
3	*The consultant provided tools that were used actually in collaborative planning to help the teachers incorporate UDL. Everybody was trained. Everybody was monitored. That was a major aspect of it.*
4	*I think because we have a built in collaborative schedule, that really helps with planning*
6	*We had a part on our lesson plan that said UDL. You had to show how you were implementing UDL into your lesson plan, at least three times a week. UDL was an initiative at my school. We had an independent consultant come in and that was our school wide instructional goal for that year.*
7	*There was a section in the lesson plans that the coaches for each department did check. We did walk-thru to see. It was very general. It was very generic. We did have walk-thru tools that everybody saw that we used and that we gave feedback on*
8	*The expectations for planning and implementing UDL weren't clear.*

In addition to support provided by instructional coaches, participants mentioned support from the consultant (See Table 12), *"The consultant working with them [teachers] made a huge impact. Teachers would have ideas and the consultant would validate or help improve ideas. Helped to have the support needed and security that their ideas were good."* (Participant 2, 2018 p. 4). Administrative support was also mentioned by participants. *"I think the initiative from the*

administration, the push from administration and the coaches supported that whole initiative, or was a big push in getting teachers to buy-in" (Participant 1, 2018 p. 4).

Participants also mentioned lack of support (See Table 12). Participant 4 (2018) suggested, *"I think the implementation of it, it probably could have been implemented a little better to where it didn't overwhelm people, because there was a lot of paperwork attached to it [UDL]."* (p. 3). Participant 8 (2018) claimed, *"The expectations for planning and implementing UDL weren't clear."* (p. 3). And further explained:

> *When you think of expectations this is something that is communicated. This is something that everyone knows, okay, this is what we expect to see. This is documentation that we expect to have. Just as mentioned before, it was a part of the lesson plan format. It was something that was added within there; however, nothing was in place as an expectation by administration. (p. 3)*

Other Relevant Findings

During interviews several topics that repeatedly surfaced: (1) Differentiated Instruction, (2) Impact on students, and (3) Training. These topics were not addressed by the research questions, but were considered impactful on implementation of UDL.

Differentiated Instruction

One topic that continuously arose throughout each interview was the comparison of UDL and differentiated instruction (DI) (See Table 13). Although these two practices are both intended to design lessons with all learners in mind, participants noted specific differences in the two. Comparisons between UDL and DI are noted in Table 13 where commentary from participants was organized to highlight the major points discussed by participants. Participant 1 (2018) explained, *"It's just a different name for differentiated instruction. If you look at the*

definition for differentiated instruction, those two pretty much line up. The content, process, and product is kind of similar to the three components that UDL has" (p. 4). When asked what the difference is between UDL and DI, Participant 5 (2018) reported, *"I really don't know that there would be any, because to me they seem kind of the same."* (p. 1).

Table 13

Differentiated Instruction and UDL

Participant	Commentary
1	*It's just a different name for differentiated instruction. If you look at the definition for differentiated instruction, those two pretty much line up. The content process and product is kind of similar to the three components that UDL has.*
3	*With UDL you differentiate from the beginning and you have the ability to reach the students.*
5	*I really don't know that there would be any difference between UDL and differentiated instruction, because to me they seem kind of the same.*
6	*It's [UDL] proactive differentiated instruction. It's differentiating before the instruction begins, whereas in traditional differentiated instruction you teach children, you figure out what they did not get and then you adjust your instruction. You're going to adjust your instruction beforehand so that they have a great chance of getting it the first time.*
7	*It's so hard to understand the difference in not seeing it [UDL] as differentiated instruction.*

Participant 6 (2018) described UDL as:

> *-ultimately, it's proactive differentiated instruction. It's differentiating before the instruction begins, whereas in traditional differentiated instruction you teach children, you figure out what they did not get and then you adjust your instruction. You're going to adjust your instruction beforehand so that they have a great chance of getting it the first time* (p. 1).

Participant 4 (2018) explained, *"I think the UDL is more prescribed. I think DI is wide open. I think UDL kind of narrowed the scope of things and helped you put it into categories."* (p. 2). Participant 3 (2018) added,

With UDL, that's embedded in how you plan for your lessons, so you're not trying to differentiate on the back side or when you see a need. You're differentiating literally from the front and giving students access to the material. If you do a good job in your lesson planning you have differentiated." (p. 1). Participant 2 (2018) pointed out, *"DI is more active engagement whereas UDL is more student centered and takes pre-planning.* (p. 1)

Participants considered UDL a tool for differentiated instruction. *"It's an excellent resource for teachers to use to meet the needs of their students"* (Participant 8, 2018 p. 1). *"During collaborative planning sessions we're planning for the differences of our students, but we're not calling it UDL"* (Participant 7, 2018 p. 6). Participant 6 (2018) added, *"If you are using UDL, then you are differentiating"* (p. 1)

Impact on Students

Another topic that came up in multiple interviews was the impact of UDL on students (See Table 14). Participants mentioned changes in student behavior; for instance, Participant 1 (2018) explained, *"UDL allowed, for the teachers to kind of look at their class and really put in strategies and supports in place to actually help support the students to deter from those [disruptive] behaviors. You're planning lessons with all students in mind to get them actively engaged so that they're not causing disruptions."* (p. 4). Participant 2 (2018) agreed by adding, *"Behavior was better in classrooms where UDL had been implemented on a regular basis."* (p. 3). Participant 4 (2018) reported less behavior issues in classes incorporating strategies consistent with UDL. *"They're less likely to act out if they're engaged and they feel like they're a part of the learning process"* (Participant 4, 2018 p. 6).

Table 14

Impact of UDL on Students

Participant	Commentary
1	*Yes UDL impacted behavior. My assistant principal said that good instruction deters that bad behavior. All of our subgroups grew. Pretty much, my philosophy is whenever we support the ESP or ESOL, that's our base line for supporting the regular ed. students.*
2	*Behavior was better in classrooms where UDL had been implemented on a regular basis.*
3	*So, I do believe that because of that specific training on executive functioning – I do believe that there was a difference for the students.*
4	*They're less likely to act out if they're engaged and they feel like they're a part of the learning process.*
6	*UDL impacts the student learning. I'm more motivated to learn. I'm not learning because somebody else is telling me to learn. I'm learning because I truly am interested in what I'm learning. I hold myself responsible.*

Participant 5 (2018) added, *"The teachers who do a really good job with UDL don't really have a lot of discipline problems because the kids are always engaged in the activities. I mean there's always something interesting. They're excited about what's going on. They look forward to seeing what's going to happen when they go in the room."* (p. 2). In Table 14 the researcher noted commentary from Participant 6 connecting UDL and student learning. Participant 6 (2018) further explained:

> *Negative behavior is usually a result of students not understanding what's going on in the classroom, being frustrated, and wanting to act out to divert attention away from the teacher, or not being engaged. The more you're able to engage students in different ways and make them responsible for their own learning and give them choices, they're more likely they are to be responsible for what you're asking them to do, and do the work. It's going to cut down on your behavior problems.* (p. 3)

Participant 1, 3, and 6, reported other impacts on students. *"All of our subgroups grew. Pretty much, my philosophy is whenever we support the ESP or ESOL, that's our base line for supporting the regular ed. students."* (Participant 1, 2018 p. 4). Participant 3 (2018) explained *"I do believe that because of that specific training on executive functioning – I do believe that there was a difference for the students."* (p. 6). Participant 6 (2018) suggested, *"UDL impacts the student learning. I'm more motivated to learn. I'm not learning because somebody else is telling me to learn. I'm learning because I truly am interested in what I'm learning. I hold myself responsible."* (p. 3).

Training

Another topic that was mentioned consistently by participants was the importance of training (See Table 15). Experiences during training impacted the overall perception of many of the participants. Participant 1 (2018) explained, *"I think that [professional development] will be very key to actually roll out [UDL] because it's a large component. And so just really getting teachers to kind of understand exactly what it is and to go slow to go fast, would be very beneficial to the teachers."* (p. 1). Participant 2, 3, and 8 agreed that training should be on-going saying *"We did multiple sessions with her over an extended period of time and the second time got into the nitty gritty"* (Participant 3, 2018 p. 1) and *"Ongoing support made this the most successful school wide PL we did."* (Participant 2, 2018 p. 5). Participant 8 (2018) expressed a need to *"make sure that professional learning is ongoing and not just once a month, but it's something that we can address on a daily basis."* (p. 1).

Table 15

Training

Participant	Commentary
1	*I think what's going to be very key is the professional development of it and what it looks like.*
2	*Ongoing support made this the most successful school wide PL we did. Everybody got training PE, Health, CTAE, everybody.*
3	*We did multiple sessions with her over an extended period of time and the second time got into the nitty gritty, especially on executive functioning*
4	*Working at [High School B], we did have to implement the UDL. That was the expectation. I did not get any type of training there with it. It was kind of expected, so I would say fellow teachers kind of explained it to me,*
6	*UDL was an initiative at my school. We had an independent consultant come in and that was our school wide instructional goal for that year*
7	*We also have to make sure we do professional learning how we want them to teach and engage their students.*
8	*Making sure that professional learning is ongoing and not just once a month, but it's something that we can address on a daily basis, with the training that I receive I still don't have an understanding of it.*

Half of the participants expressed a concern with the level of training received at their location (See Table 15). Participant 4 (2018) stated, *"We did have to implement the UDL. That was the expectation. I did not get any type of training there with it. It was kind of expected"* (p. 2). Participant 6 (2018) reported, *"We had an independent consultant come in and that was our school wide instructional goal for that year"* (p. 2). Participant 7 and 8 agreed saying *"it [training] was not consistent, but it was there. It [UDL] wasn't something I would say I was exposed to effectively."* (Participant 8, 2018 p. 2) and *"I don't think the training was given in a UDL fashion."* (Participant 7, 2018 p. 3). Participant 7 further explained:

> *We have to make sure we do professional learning how we want them to teach and engage their students. We were presented UDL but the teachers, instructional coaches, and our administrators were not receiving it. It was just here's this white sheet of paper, and one of the principles of UDL is to use a little color. We were given white paper. We*

were given the regular PowerPoint presentations. We were sitting down listening. We were not active. So, those kinds of things, I think that is the disconnect. (p. 3)

Participant 8 (2018) also expressed concern saying, *"With the training that I received I still don't have an understanding of it."* (p. 2), but clarified the perception:

I'm quite sure it is something that's successful if fully exposed and trained, and expectations were there. If there was real good training that is ongoing, and from someone who is knowledgeable to be honest with the questions and answers of the teachers and the principals, I think it could be something great. (p. 10)

Data Analysis

Organization of Data Analysis

The themes identified in the findings section were organized based on research question. Training and implementation had their own categories. These categories were presented using summary tables followed with a narrative explaining how the table supports the category.

Interpretation of Results

During data analysis the researcher organized the data into three categories; research question 1, research question 2, and training and implementation. These categories were used to report the data and interpretation. Overall, results indicated that instructional coaches consider UDL impacted teacher pedagogical practices.

Research question 1. To what extent do high school instructional coaches perceive UDL has influenced the teacher pedagogy of teachers in a southwestern Georgia county?

Impact on teachers. The majority of participants (58%) reported that UDL had a direct impact on teacher pedagogy (See Table 16). Participants reported a change in teacher pedagogy linked directly to UDL training. All of the participants who reported a change had a medium to

high level of UDL knowledge and experience. Participant 1 and 8 mentioned a change in ability to choose strategies; Participant 6 (2018) suggested those teachers trained in UDL were *"more comfortable reaching children different ways"* (p. 3) and participant 2 (2018) reported that UDL training improved teacher practice *"instructionally and behaviorally"* (p. 3).

Organized in table 16 commentary from the majority of participants was used to support the impact UDL had on teacher pedagogy; however, not all participants considered the changes in teacher pedagogy to be a result of UDL training (See Table 17).

Table 16

Positive Impacts on Teacher Pedagogy

Participant	Commentary
1	*UDL directly impacted the teacher, it allowed our veteran teachers to go back in their toolbox and start pulling those strategies they had in them but were not using.*
2	*Teachers did change their practices after the UDL training and their practice improved, both instructionally and behaviorally.*
3	*It [UDL] became a part of their practice, not something tacked on, but this is how I do it.*
6	*Those [teachers] that have had UDL training in the past, they're more comfortable reaching children different ways.*
8	*I do say that the veteran teachers in those particular places where we have the multiple means of representations, multiple means of engagement on the lesson plan, they're able to plug strategies in there more easily compared to our new teachers.*

Table 17

Concerns Over Perceived Impact of UDL on Teacher Pedagogy

Participant	Commentary
4	*I think teachers are thinking about it [student diversity], but they may not think about it in the respect of the UDL.*
5	*I really don't know that there would be any difference, because to me UDL and differentiated instruction seem kind of the same.*
7	*I don't see the difference, but we are looking for differentiation, so I guess it's [UDL] there, but it's not there, you know*

Several participants were unsure if the impact on teacher pedagogy could be attributed to UDL training, as seen in Table 17. These three participants represented the medium, low, and zero level groups based on UDL knowledge and experience. Participant 4 (2018) explained, *"I think teachers are thinking about it [student diversity], but they may not think about it in the respect of the UDL."* (p. 4). Participant 5 and 7 associated UDL with differentiated instruction saying, *"UDL and differentiated instruction seem kind of the same."* (Participant 5, 2018 p. 5) and Participant 7 (2018) added, *"I don't see the difference, but we are looking for differentiation, so I guess it's [UDL] there, but it's not there, you know"* (p. 4).

The researcher analyzed the additional findings regarding differentiated instruction (DI) to further investigate the difference between UDL and DI. These findings were organized based on perceived similarities (See Table 18) and differences (See Table 19) between UDL and DI.

Table 18

UDL and Differentiated Instruction: Similarities

Participant	Commentary
1	*It's just a different name for differentiated instruction. If you look at the definition for differentiated instruction, those two pretty much line up. The content process and product is kind of similar to the three components that UDL has.*
5	*I really don't know that there would be any difference between UDL and differentiated instruction, because to me they seem kind of the same.*
6	*if you are using UDL, then you are differentiating*
7	*It's so hard to understand the difference in not seeing it [UDL] as differentiated instruction.*

Participants compared UDL to DI, as seen in Table 18 and 19. Participant 1 (2018) suggested, *"It's just a different name for differentiated instruction. If you look at the definition for differentiated instruction, those two pretty much line up. The content process and product is kind of similar to the three components that UDL has."* (p.1). Participant 1 later explained, *"I*

think UDL is better because it kind of targets differentiation the way they break it down." (p. 1) (See Table 19).

Participant 6 (2018) explained, *"If you are using UDL, then you are differentiating"* (p. 1) (See Table 18) and then added,

> *It's [UDL] proactive differentiated instruction. It's differentiating before the instruction begins, whereas in traditional differentiated instruction you teach children, you figure out what they did not get and then you adjust your instruction. You're going to adjust your instruction beforehand so that they have a great chance of getting it the first time.* (p. 1)

Even though these participants compared UDL to DI, they both explained that UDL is more targeted and proactive, both seen as positive impacts by these participants.

Table 19

UDL and Differentiated Instruction: Differences

Participant	Commentary
1	*I think UDL is better because it kind of targets differentiation the way they break it down*
2	*DI is more active engagement whereas UDL is more student centered and takes pre-planning*
3	*With UDL you differentiate from the beginning and you have the ability to reach the students. With UDL, that's embedded in how you plan for your lessons, so you're not trying to differentiate on the back side or when you see a need. You're differentiating literally from the front and giving students access to the material. If you do a good job in your lesson planning you have differentiated*
4	*"I think the UDL is more prescribed. I think DI is wide open. I think UDL kind of narrowed the scope of things and helped you put it into categories."*
6	*It's [UDL] proactive differentiated instruction. It's differentiating before the instruction begins, whereas in traditional differentiated instruction you teach children, you figure out what they did not get and then you adjust your instruction. You're going to adjust your instruction beforehand so that they have a great chance of getting it the first time.*
7	*During collaborative planning sessions we're planning for the differences of our students, but we're not calling it UDL*
8	*It's an excellent resource for teachers to use to meet the needs of their students*

Several participants described UDL in relation to DI (See Table 19) often describing UDL as being more organized. *"It [UDL] kind of targets differentiation the way they break it down"* (Participant 1, 2018 p. 1). Participant 3 (2018) agreed, *"UDL takes what is best practices and puts it under a very organized umbrella"* (p. 7) and Participant 4 (2018) added, *"I think the UDL is more prescribed. I think DI is wide open. I think UDL kind of narrowed the scope of things and helped you put it into categories."* (p. 2).

Other participants described UDL as a proactive differentiation (See Table 19). Participant 2 (2018) explained, *"UDL is more student centered and takes pre-planning"* (p. 1) while Participant 3 and 6 suggested, *"With UDL you differentiate from the beginning"* (Participant 3, 2018 p. 1) and *"It's [UDL] differentiating before the instruction begins, whereas in traditional differentiated instruction you teach children, you figure out what they did not get and then you adjust your instruction"* (Participant 6, 2018 p. 1)

Two of the participants perceived UDL did not impact teacher pedagogy considering UDL a division of DI (See Table 18). Participant 5 (2018) stated, *"I really don't know that there would be any difference between UDL and differentiated instruction, because to me they seem kind of the same."* (p. 5). Participant 7 (2018) added, *"What you're saying is going on is not a change in the instruction. We're just saying you're already doing this, so basically, you're already doing UDL, so what are we really gaining from it."* (p. 3).

Instructional strategies. Another difference in teacher pedagogy consistently reported by participants was the use of a wide variety of instructional strategies (See Table 7). Six of the eight participants (75%) reported an increase in instructional strategies considered to be an

impact of UDL training (See Table 20) and half the participants related the increase in strategies to resources provided during UDL training (See Table 21).

Table 20

Perceived Increase in Instructional Strategies

Participant	Commentary
1	*It [UDL] just gives pretty much strategies on how to engage students. It got teachers to actually start utilizing more strategies and being more intentional about what you do.*
3	*I began to see manipulatives used. You began to see students doing different things, so in a given moment in time you'd have multiple things going on in the classroom, which requires a whole different kind of teacher interaction with students.*
4	*I definitely see various ways of getting out information. It used to be lecture, lecture, lecture, but I think teachers now, I see them trying to figure out different ways for kids to acquire information beyond traditional ways.*
5	*I see tangible text. I see videos. I see audios. Hands-on activities.*
6	*They do hands-on activities to try to engage the students with the lesson when they're introducing. They do a lot of vocabulary activities, matching, to try to teach vocabulary terms, create word walls. They like carousels and do some reading and writing assignments to incorporate literacy.*
8	*I do say that the veteran teachers in those particular places where we have the multiple means of representations, multiple means of engagement on the lesson plan, they're able to plug strategies in there more easily compared to our new teachers.*

Participant 1, 3, 4, and 6, three high level (HL) and one low level (LL) group members, described a change in the use of instructional strategies (See Table 20) that resulted from utilizing a checklist resource provided during UDL training (See Table 21). Participant 8 (2018), a medium level (ML) group member, referenced the ability to incorporate strategies during the planning process which was attributed to UDL training. Participant 5 (2018), a zero level (ZL) group member, saw a variety of strategies, but did not attribute this to UDL resources. Besides the increase in instructional strategies mentioned by six of the eight participants, specific strategies were mentioned repeatedly (See Table 8). The researcher organized the strategies in

Table 8 by level of UDL knowledge and experience of the participant who mentioned the strategy (See Table 22).

Data reported in Table 20 supported the differences, observed by instructional coaches, in the use of instructional strategies to support student variance. These instructional strategies were described as more student centered and collaborative which are practices supported by creators of the UDL framework (Rose & Meyer, 2002).

Table 21

Resources Provided During UDL Training

Participant	Commentary
1	*It [UDL] did give us strategies to use to just pull from that teachers could actually employ.*
3	*Teachers used specific examples of how UDL could be done in the classroom. It was a full page, just about a full page for every one of the UDL principles.*
4	*Teachers had a check-off list of strategies they could use.*
6	*The consultant provide one resource, a list of strategies teachers could use to plan their lessons. This was very useful for the teachers.*

Table 22

Perceived Use of Instructional Strategies Based on Level of UDL Knowledge

Level of UDL knowledge	Total number of strategies mentioned	Percentage of strategies mentioned
High Level (HL)	71	57.7%
Medium Level (ML)	22	17.9%
Low Level (LL)	23	18.7%
Zero Level (ZL)	67	5.7%

Participants referenced resources (See Table 21) provided during training, that were utilized to determine instructional strategies that could be used to support a variety of students. These resources were utilized during collaborative planning sessions to plan lessons meant to activate all three learning networks. The resources made planning for student variance a more organized and prescriptive process.

As seen in Table 22, the participants with the high level of UDL knowledge reported 57.7% of the strategies mentioned in the interviews. The participant with a zero level of UDL knowledge reported only 5.7% of the strategies mentioned during interviews. Those in the medium and low level of UDL knowledge reported 17.9% and 18.7% of strategies. This indicates that UDL training impacted not only teacher use of strategies and resources, but the ability of instructional coaches to recognize strategies that are being used to target student differences

The strategies reported by instructional coaches were cross referenced with strategies specifically suggested in the UDL framework (See Table 23). For instance; Checkpoint 1.1, Offer ways of customizing the display of information included, the color used for information or emphasis as an option for customization (Goalbook, 2018). Altering color of text was mentioned five times by 38% of the participants. Other examples can be seen in Table 23.

In Table 23 strategies were listed according to the UDL guidelines outlined in Figure 2: Universal Design for Learning Guidelines. For example checkpoint 2.5 Illustrate through multiple media is part of the Multiple Means of Representation portion of the UDL framework. One of the examples provided for checkpoint 2.5 is present key concepts in an alternative form (e.g., video) (Goalbook, 2018). Use of video was mentioned by four of the eight participants, ten times during the interviews as an example of a strategy used by teachers.

Provide guides and checklists for scaffolding goal-setting was an example listed under Checkpoint 6.1 Guide appropriate goal-setting in the Multiple Means of Action and Expression portion of the UDL framework (NCUDL). Goal setting was mentioned 5 times by 50% of the participants. Checkpoint 7.1, Optimize individual choice and autonomy, provided a list of ways to maximize choice including the context or content used for practicing and assessing skills, the

tools used for information gathering or production, the color, design of graphics or layouts, etc. (Goalbook, 2018). Participants reported these options were parts of choice boards and menus utilized in many classrooms. Choice boards were mentioned as an option for Multiple Means of Engagement 18 times by 6 of the eight participants.

Table 23

Frequency of Strategies by UDL Checkpoint

Strategy (UDL checkpoint)	Number of times strategy was mentioned
1.1 Offer ways of customizing the display of information	5
1.2 Offer alternatives for auditory information	4
1.3 Offer alternatives for visual information	8
2.1 Clarify vocabulary and symbols	8
2.3 Support decoding text, mathematical notation, and symbols	2
2.5 Illustrate through multiple media	45
3.1 Activate or supply background knowledge	4
3.2 Highlight patterns, critical features, big ideas, and relationships	8
3.3 Guide information processing, visualization, and manipulation	9
3.4 Maximize transfer and generalization	19
4.1 Vary methods of response	8
4.2 Vary the methods for navigation	24
4.3 Optimize access to tools and assistive technologies	7
5.1 Use multiple media for communication	17
5.2 Use multiple tools for construction and composition	12
5.3	15

Build fluencies with graduated levels of support for practice and performance	
6.1	7
Guide appropriate goal-setting	
6.2	2
Support planning and strategy development	
6.3	5
Facilitate managing information and resources	
6.4	10
Enhance capacity for monitoring progress	
7.1	15
Optimizing individual choice an autonomy	
7.2	5
Optimize relevance, value, and authenticity	
7.3	8
Minimize threats and distractions	
8.1	9
Heighten salience of goals and objectives	
8.2	17
Vary demands and resources to optimize challenge	
8.3	6
Foster collaboration and communication	
8.4	3
Increase mastery-oriented feedback	
9.1	8
Promote expectations and beliefs that optimize motivation	
9.2	5
facilitate personal coping skills and strategies	
9.3	17
Develop self-assessment and reflection	

Guidelines one through three are part of the Multiple Means of Representation portion of the UDL framework while guidelines four through six address Multiple Means of Action and Expression and seven through nine address Multiple Means of Engagement. Utilizing Table 23: Frequency of Strategies by UDL Checkpoint, the total number of strategies that fall into each guiding principle were calculated (See Table 24).

Table 24

Frequency of Strategies by UDL Guiding Principle

UDL Guiding Principle	Frequency of strategies	Percentage of responses
Multiple Means of Representation	112	35.9%
Multiple Means of Action and Expression	107	34.3%
Multiple Means of Engagement	93	29.8%

As seen in Table 24, the majority of the responses (35.9%) fell within the multiple means of representation portion of the framework. The top strategies utilized in the representation portion of the framework were use of video, an example provided under checkpoint 2.5 illustrate through multiple media; graphic organizers, an example given for checkpoint 3.4 maximize transfer and generalization; and use of color for emphasis and example provided for checkpoint 1.3 offer alternatives for visual information (See Table 23).

Thirty-four percent of responses were part of the Multiple Means of Action and Expression portion of the UDL framework (See table 24). The main strategies reported for the expression principle were goal setting, a strategy suggested for checkpoint 6.4 enhance capacity for monitoring progress; gradual release, a strategy recommended for checkpoint 5.3 build fluencies with graduated levels of support for practice and performance and online tools for collaboration, a strategy provided for checkpoint 5.1 use multiple media for communication.

The least used principle was Multiple Means of Engagement with only 29.8% of all strategies named falling in the engagement portion of the framework (See Table 24). The major strategies discussed which fall in the engagement portion of the framework were use of choice boards, a strategy suggested for checkpoint 7.1 optimizing individual choice an autonomy; self-monitoring by the students, a strategy provided for checkpoint 8.2 vary demands and resources to

optimize challenge; and station activities, a strategy suggested for checkpoint 8.1 heighten salience of goals and objectives.

Impact on students. Participants also reported various changes in students they attributed to UDL (See Table 14). The majority of these student impacts were related to behavior of the students (See Table 25). The majority of the participants (60%) who perceived student impact reported that student behavior was better in classes incorporating UDL principles.

Participants 4 and 6 further explained the reasoning behind the improved behavior (See Table 25). "*Negative behavior is usually a result of students not understanding, being frustrated, or bored."* stated Participant 6 (p. 3). Participant 4 added that students being an active part of the learning process and being able to choose from options created an atmosphere where students "feel a part" (p. 6) causing an increase in positive behaviors.

Table 25

Positive Behavior Impacts

Participant	Commentary
1	*Yes UDL impacted behavior.*
2	*Behavior was better in classrooms where UDL had been implemented on a regular basis.*
4	*They're less likely to act out if they're engaged and they feel like they're a part of the learning process.*
6	*Negative behavior is usually a result of students not understanding, being frustrated, or bored. The more you're able to engage students in different ways and make them responsible for their own learning and give them choices, they're more likely they are to be responsible for what you're asking them to do, and do the work. It's going to cut down on your behavior problems.*

Other participants also reported impact of student achievement, *"All of our subgroups grew. Pretty much, my philosophy is whenever we support the ESP or ESOL, that's our base line for supporting the regular ed. students."* (Participant 1, 2018 p. 4) as well as different

aspects of student efficacy: *"I'm more motivated to learn. I'm not learning because somebody else is telling me to learn. I'm learning because I truly am interested in what I'm learning. I hold myself responsible."* (Participant 6, 2018 p. 3).

Based on participant responses, instructional coaches perceive UDL impacted teacher pedagogy. Although many participants saw UDL as a form of DI, the majority did explain specific differences that make UDL easier to implement. The majority of instructional coaches reported an increase in the use of instructional strategies including presentation of materials, student choice, and goal setting. Half of the participants attributed the increase in strategy use to resources from the UDL training. Several participants also recognized positive student impact due to UDL.

Research question 2. To what extent do high school instructional coaches perceive UDL has influenced the lesson planning practices of teachers in a southwestern Georgia county?

Impact on lesson planning practices. The majority (87.5%) of participants reported an impact on the lesson planning practices of teachers in the district (See Table 10). Five of the participants (62.5%) expressed a concern for the extra time needed to incorporate the principles into lesson plans (See Table 11). To further analyze the impact of increased time on the implementation of UDL the researcher organized the data in Table 10 and 11 into one table (See Table 26).

Three of the participants 1, 2, and 8 all discussed the changes in teacher planning without reporting concern for extra time needed to plan effectively. Participant 1 (2018) described planning as having *"more meat"* and being more *"intentional"* (p. 3). Participant 2 and 8 describe a lesson planning template that was utilized to aid teachers in the planning process (See Table 26).

Table 26

UDL and Teacher Planning: Impacts and Concerns

Participant	Commentary: Impact on Planning	Commentary: Concern for increased time required for planning
1	*I think the planning [was most impacted]. Yes. It had more meat, more quality. That planning piece was very big. It got teachers to actually start utilizing more strategies and being more intentional about what you do.*	
2	*I would say somewhat yes [impacted lesson planning]. Collaborative planning included use of template to guide planning.*	
3	*The planning then began to be very specific in terms of how do we? What are the things I need to do in order to get this across to different students?*	*Like I said, UDL, learning to be effective in UDL, it does take time. It [UDL] uses an entirely different method of planning*
4	*It makes you think about your instruction. You really have to be strategic in what you do, and I think that kind of weeds through a lot of the fluff.*	*It's [UDL] good practice, but it depends on how you're expecting the teachers to go about doing it. If they can just do it and teach, sure. But if they've got to fill out a whole bunch of forms, and submit a bunch of stuff, then they take up all their time doing paperwork instead of the actual task of doing it.*
5		*But, I think it's hard for teachers to plan all of that. I don't know that it's so much of the planning of it [UDL] that's hard, but it's writing up the plan that is kind of a deterrent to the teachers.*
6	*We had a part on our lesson plan that said UDL. You had to show how you were implementing UDL into your lesson plan, at least three times a week*	*It takes a lot of planning to use UDL effectively. UDL requires a lot of planning in advance, so if you're doing a tic tac toe activity, coming up with nine options can be stressful on the teacher, but once it's developed it is easier.*
7	*I would say when we were doing it, the process of planning had changed, but the implementation not so much. The planning part was*	*The amount of time that teachers are given to plan is a deterrent to implementation. I think the planning is major. If planning is not taking place, then it [UDL] can't be done effectively.*

8	*better, but we still couldn't implement it the way it needed to be. It's part of the lesson plan format that you're pretty much listing what strategies you're doing for each part.*

Participant 3, 4, 6, and 7 reported a change in the planning practices of teachers, but elaborated adding comments about time and extra work and planning that was required (See Table 26). Participant 3 and 6, both high level (HL) group members, reported, *"Learning to be effective in UDL, it does take time. It [UDL] uses an entirely different method of planning"* (Participant 3, 2018 p. 11) and *"It takes a lot of planning to use UDL effectively. UDL requires a lot of planning in advance, so if you're doing a tic-tac-toe activity, coming up with nine options can be stressful on the teacher, but once it's developed it is easier."* (Participant 6, 2018 p. 1). Participant 5 (2018) described the amount of time needed to plan as a "*deterrent*" (p. 1) and participant 4 (2018) described an excessive amount of paperwork that *"overwhelmed people"* (p. 3).

Participant 5 (2018) did not report a significant change in the planning process, but instead reported the increase in paperwork as a *"tedious"* (p. 3) process. An increase in the amount of paperwork was mentioned by participant 4 and 5. These participants represented the lowest levels of UDL knowledge and experience.

Support during lesson planning. Another recurring topic was the level of support received during the planning process (See Table 12). Support was separated into 3 categories: (1) support from the consultant (See Table 27), (2) support from instructional coaches (See Table 28), and (3) support from administration (See Table 29).

Table 27

Support: Consultant

Participant	Commentary
1	*They [consultants] provided, pretty much, examples of the engagement pieces, and the examples of the representation and Action and expression*
2	*Consultant working with them made a huge impact. Teachers would have ideas and the consultant would validate or help improve ideas. It helped to have the support needed and security that their ideas were good.*
3	*The consultant provided tools that were used actually in collaborative planning to help the teachers incorporate UDL*
6	*We [school faculty] had a lady that came pretty much monthly and did PL sessions.*
7	*We [instructional coaches] had [training sessions] for two years, once a month from that consultant.*

Table 28

Support: Instructional Coaches

Participant	Commentary
1	*The good thing about us is that we were part of the planning process, so we pretty much knew most of what was in the lesson plan because we actually helped write it, or we were at least there to ask questions about what they planned to do*
2	*Then we met afterwards as a department and feedback was given.*
3	*We received training. We would go in and she would say, okay, what did you see? And so, we were trained in the monitoring piece, so it wasn't this is what the teachers are getting PL in. This is what the entire school, faculty, staff, admin, everybody was getting.*
6	*We had a part on our lesson plan that said UDL. You had to show how you were implementing UDL into your lesson plan, at least three times a week.*
7	*There was a section in the lesson plans that the coaches for each department did check. We did walk-thru to see. It was very general. It was very generic. We did have walk-thru tools that everybody saw that we used and that we gave feedback on. Our new teachers, they never was exposed to UDL.*

Participants 1 and 3 both described support from the consultant in the form of resources that teachers utilized during lesson planning (See Table 27). As seen in Table 27, collaboration during planning and feedback from observations was also a beneficial support for teachers, instructional coaches, and administration during implementation that was provided by the

consultant in addition to initial training. Although Participant 6 and 7 participated in training that was on-going, the participants did not consider the consultant to be supportive of the efforts in those locations. Both participants 6 and 7 reported multiple initiatives being implemented simultaneously at their locations which, they perceived, impacted the overall implementation of UDL.

Participants that described support from instructional coaches were among the most trained participants representing the HL and ML groups. Participant 1 and 2 described a more intensive support utilized during teacher planning. Participant 3, 6, and 7 described as process of observation and feedback more so than individual assistance. As described in Table 28, a collaborative nature between instructional coaches and teachers during implementation was essential. Instructional coaches and administrators were trained on how to monitor and provide feedback and support. This level of training helped eliminate confusion and instill a level of knowledge that allowed a continuous, daily level of support to teachers.

Table 29

Support: Administration

Participant	Commentary
1	*I think the initiative from the administration, the push from administration and the coaches supported that whole initiative, or was a big push in getting teachers to buy-in.*
2	*All staff members were expected to implement UDL. Monitored by observations using walkthrough tools.*
3	*The admin was in the trainings. The admin were in the classes monitoring alongside the consultant. Everybody was trained. Everybody was monitored. That was a major aspect of it.*
4	*I think because we have a built in collaborative schedule, that really helps with planning*
6	*UDL was an initiative at my school.*
	Leadership, they set the focus for what the instructional goals are
8	*The expectations for planning and implementing UDL weren't clear.*

The majority of participants reported the importance of administrative support during implementation, a reflected in table 29. Participant 1 and 3 expressed the importance of administration being a part of professional learning as well as planning. Participant 2, 3, and 6 reported a school initiative with expectations for implementation. *"All staff members"* were trained (Participant 2, 2018 p. 2; Participant 3, 2018 p. 4), implementation was *"monitored by observations and walkthrough tools"* (Participant 2, 2018 p. 2), and *"UDL was an initiative at my school."* (Participant 6, 2018 p. 2) were responses noted during interviews.

Participant 6 and 8 expressed concern for the lack of support during implementation. Participant 6 (2018) explained, *"Leadership, they set the focus for what the instructional goals are"* (p. 2) and Participant 8 (2018) reported an ineffective level of support stating, *"The expectations for planning and implementing UDL weren't clear."* (p. 3). Participant 3 (2018) specifically stated, *"It's got to be more than just a teacher directed thing. It needs to be owned by the teachers, but it needs to be understood and encouraged by administration, by coaches, and by district"* (p. 2).

Based on participant responses, instructional coaches perceived an impact on teacher planning practices. The majority of participants reported a change directly related to training and resources provided during training. There was a negative impact regarding UDL as it relates to the amount of time for planning. Five of eight participants reported a concern for time and paperwork required to effectively implement UDL.

Participants also reported the importance of support during implementation. Two participants with a high level of training and experience reported the importance of support from instructional coaches, the consultant and administration. Two participants, one with a high level and one with a medium level of training and experience, reported support from the

administration and instructional coaches was important during planning. One participant with a medium level of training only perceived support from the instructional coaches, one with a low level of training reported support from administration and the participant with a zero level of training and experience did not report an importance for support.

Training and implementation. Two categories that emerged during data analysis were not categorized under a particular research question but had an impact on the results. Participants consistently categorized the principles of UDL based on ease of implementation (See Table 9). These responses were organized to further understand the ease with which teachers implement UDL principles (See Table 30, Table 31, and Table 32).

Table 30

Ease of Implementation: Multiple Means of Representation

Participant	Commentary
1	*I think both (representation and action and expression were equally implemented).*
2	*I think representation was most utilized*
3	*multiple means of representation is definitely the easiest of the three to do*
4	*multiple means of representation, I think that's the one that really stuck with me*

Table 31

Ease of Implementation: Multiple Means of Action and Expression

Participant	Commentary
1	*I think both (representation and action and expression were equally implemented).*
2	*Choice was a big part*
3	*It was multiple means of action and expression that was second to come along. That was where, you know, there was a lot of choice involved with the students,*

According to participants, Multiple Means of Representation was the easiest to implement (See Table 30), followed by Multiple Means of Action and Expression (See Table 31)

and Multiple Means of Engagement was considered the principle that was the hardest to implement (See Table 32).

Table 32

Ease of Implementation: Multiple Means of Engagement

Participant	Commentary
1	*Engagement- That's the component that we kind of struggled with and needed some improvement on*
3	*Multiple means of engagement was kind of the next phase. I would say we really didn't get to the last one*
5	*I think that's probably the hardest part*

Instructional coaches reported Multiple Means of Action and Expressions and Multiple Means of Engagement were areas where more training was needed. This need for more training was reflected in the use of instructional strategies from the action and expression and the engagement portions of the framework.

Concerns with training was a common topic of conversation during interviews (See Table 15). Three participants (37.5%) suggested the training should be on-going (See Table 33).

Table 33

On-Going Training

Participant	Commentary
2	*Ongoing support made this the most successful school wide PL we did*
3	*We did multiple sessions with her over an extended period of time and the second time got into the nitty gritty, especially on executive functioning*
8	*Making sure that professional learning is ongoing and not just once a month, but it's something that we can address on a daily basis, with the training that I receive I still don't have an understanding of it.*

Participants 2 and 3 discussed the success they had with using an on-going model of support (See Table 33). *"Ongoing support made this the most successful school wide PL we did"* (Participant 2, 2018 p. 5). Participant 3 (2018) suggested further training enabled the staff at that

location to gain a deeper understanding, *"We did multiple sessions with her over an extended period of time and the second time got into the nitty gritty, especially on executive functioning"* (p. 1).

Participant 8 (2018) discussed on-going training after having an "ineffective" (p. 1) training experience (See Table 33). *"Making sure that professional learning is ongoing and not just once a month, but it's something that we can address on a daily basis, with the training that I receive I still don't have an understanding of it."* (p. 1).

Two Participants stressed the importance of the format of the training itself (See Table 34). Participant 2 (2018) described the training format as *"The consultant (a) presented an overview of UDL to all staff members, (b) collaboratively planned with staff, (c) observed a lesson, and finally (d) provided teachers with feedback."* (p. 2). This format of planning was reported by participant 2 and 3 as well (See Table 34). Participant 6 (2018) described a process similar to one described by Participant 1 (2018) without the focus on having the consultant in the planning process.

Participant 7 and 8 described a training that was ineffective and inconsistent, as referenced in Table 34. Participant 7 (2018) further explained:

> *The training, I don't think the training was given in a UDL fashion, so we were presented UDL but the teachers were not receiving – the teachers, and us, and along with our administrators, were not receiving it. It was just here's this white sheet of paper, and one of the principles of UDL is to use a little color. We were given white paper. We were given the regular PowerPoint presentations. We were sitting down listening. We were not active. So, those kinds of things, I think that is the disconnect with it.* (p. 3)

Table 34

Format of Training

Participant	Commentary
1	*I think what's going to be very key is the professional development of it and what it looks like.*
2	*Our training schedule consisted of weekly support over a 2 month span. After the initial training and refresher session the consultant was part of the planning process for 2 weeks before doing cycles of observation and feedback. Department chairs were included in observations for transference and continuity.*
3	*We spaced the trainings so that we had time to implement it as we went along.*
6	*We had an independent consultant come in and that was our school side instructional goal for that year*
7	*We also have to make sure we do professional learning how we want them to teach and engage their students. I don't think the training was given in a UDL fashion.*
8	*it [training] was not consistent, but it was there. It [UDL] wasn't something I would say I was exposed to effectively with the training that I receive I still don't have an understanding of it.*

Participant 8 (2018) concurred saying, *"There was PL down the line that myself and the teachers were exposed to that was not – it was not consistent, but it was there. It wasn't something I would say I was exposed to effectively."* (p. 2).

Four participants (50%) reported school wide initiatives to implement UDL (See Table 35). This level of implementation reflected administrative support for the initiative.

Half of the participants discussed a school wide implementation expectation (See Table 35). Participant 1 (2018) explained saying, *"I think the initiative from the administration, the push from administration and the coaches supported that whole initiative, or was a big push in getting teachers to buy-in"* (p. 7). In contrast Participant 8 (2018) described the expectations as *"unclear"* (p. 3) explaining, *"When you think of expectations this is something that is*

communicated. This is something that everyone knows, okay, this is what we expect to see." (p. 3).

Table 35

School Wide Initiatives

Participant	Commentary
1	*The expectation was that we had at least one component from each of the three areas inside your lesson plan for the week.*
3	*Everybody was trained. Everybody was monitored. That was a major aspect of it.*
4	*Working at [High School B], we did have to implement the UDL. That was the expectation. I did not get any type of training there with it. It was kind of expected, so I would say fellow teachers kind of explained it to me,*
6	*UDL was an initiative at my school. We had an independent consultant come in and that was our school wide instructional goal for that year*

Based on responses from instructional coaches during individual interviews, the training was a major contributor to implementation. Responses from participants indicated that the UDL principles were not equally easy to implement. Participants considered Multiple Means of Representation to be the easiest to implement followed by Multiple Means of Action and Expression, and then Multiple Means of Engagement.

Participants 1, 2, 3, and 6 were trained in a similar format of training followed by planning and observations. These participants also perceived an impact on teacher pedagogy. Participants 7 and 8 considered their training experience to be ineffective and did not consider UDL impacted teacher pedagogy (See Table 6). Participants 1, 2, 3, 6, 7, and 8 all reported a change in teacher planning practices that they perceived was linked to UDL training.

Summary

The researcher presented qualitative findings based on research questions. Findings revealed that instructional coaches do consider UDL training impacted teacher pedagogy and

lesson planning practices. The impact on teacher pedagogy was presented based on three themes that emerged during data analysis; overall impact, strategies used by teachers, and student impact. The impact on teacher planning practices was organized based on two themes; time and support. Time for planning seemed to be a concern for many of the participants and was viewed as a negative impact. Support during planning was broken down further into support from instructional coaches, consultants, and administration.

There were several themes that emerged outside the realm of the research questions, but impacted to the data. Differentiated instruction (DI), ease of implementation, and training were consistently discussed during each interview. These themes were also presented and discussed. DI was discussed as a subpart of research question 1 as it deals more with teacher pedagogy. Although many discussed DI and UDL interchangeably, the majority reported UDL to be a more targeted and prescriptive form of DI. Training and ease of implementation were discussed as a possible impacts on implementation of UDL. Participants who perceived training to be effective reported an impact on teacher pedagogy and lesson planning practices more than those not trained or trained ineffectively. The level of training also impacted the ability to implement all 3 UDL principles into classroom instruction.

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter five was a synopsis of high school instructional coaches' perceptions about the impact Universal Design for Learning (UDL) had on teacher pedagogy and lesson planning practices. Findings from the current study were analyzed and compared with previous studies and summarized to determine implications and recommendations.

Summary

The educational system in America changed dramatically since the nation's infancy. In the beginning, education was reserved for young men who were often wealthy, intelligent, and politically connected. As the nation grew, the educational demands shifted to include all students resulting in a more diverse classroom. These changes required teachers to make changes to classroom structure and pedagogy.

The Universal Design for Learning (UDL) framework was designed by the Center for Applied Specialized Technology (CAST) to address the various needs of learners. One southwest Georgia school district implemented faculty-wide UDL training between 2014 and 2017. The researcher proposed to investigate the perceptions high school instructional coaches in this district had about the impact UDL training had on teacher pedagogy and lesson planning practices. Many studies were found which took place at the postsecondary level focusing on teacher or student perceptions; however, minimal studies were found which focused on the high school level and none were found which utilized perceptions of instructional coaches. As the leaders of professional development for the schools, the researcher considered instructional coach perceptions to be a particularly valuable resource to inform the research.

The researcher chose the southwest Georgia school district due to the UDL training which took place at each high school. Using a purposive sampling technique, the researcher

gained permission from the superintendent of the district as well as the principal from each district high school prior to contacting each high school instructional coach in the district. The researcher used a qualitative design to facilitate individual face-to-face interviews with the instructional coaches to answer the two research questions: (1) To what extent do instructional coaches perceive UDL has influenced teacher pedagogy in a southwestern Georgia county? and (2) To what extent do instructional coaches perceive UDL has influenced teacher lesson planning practices in a southwestern Georgia county?

The researcher utilized the district email server to contact the 12 high school instructional coaches currently serving in the designated district. Eight of the instructional coaches agreed to participate in the individual face-to-face interviews giving an overall response rate of 66%. Participants were placed into one of four groups based on UDL knowledge and training. The high level group (HL) consisted of those with four or more years of training and experience with UDL while those who participated in courses, classes, or independent research and had between one and three years of training and work made up the medium level (ML) group. The low level group (LL) consisted of those with no training, but have had a course in college or have read some articles and finally, the zero level group (ZL) contained those with no training, no classes, and have done no independent research. Results were analyzed based on these groups to determine if UDL training impacted the instructional coach perceptions.

Findings

Participants reported, for the first research question, an overall positive impact on teacher pedagogy. Sixty-two percent of the participants reported a direct impact on teacher pedagogy resulting from UDL training listing increase in strategies, student-centered instruction, and comfort with addressing student diversity as evidence of the change. The participants in the 62%

who perceived an impact represented the HL, ML, and LL groups while the three participants who did not perceive an impact represented the ML, LL, and ZL groups. Those three participants suggested that teachers were using differentiated instruction (DI), not UDL. Even though the majority of participants described UDL as more prescribed, organized, and specific than DI, there were two participants who did not consider UDL to be different from DI. These participants represented the ML and ZL groups.

Participants who reported an impact on teacher pedagogy categorized the level of implementation based on the UDL principles Multiple Means of Representation, Multiple Means of Action and Expression, and Multiple Means of Engagement. Thirty-eight percent suggested Multiple Means of Representation was the easiest to implement and Multiple Means of Action and expression was second easiest to implement. One participant considered these two principles to be equally easy to implement. Regardless of the level of training and experience, participants found Multiple Means of Engagement to be the most difficult to implement. Participant 3 reported that this portion was not emphasized during training while Participant 1 concluded that teachers were more comfortable implementing representation and action and expression strategies and so the engagement strategies were least utilized and needed improvement.

For the second research question, 87.5% of participants agreed that UDL training had impacted teacher planning practices. This impact was reported in the form of modified lesson planning templates which included an area for each of the three UDL principles, use of instructional resources provided by the consultant, and a more collaborative planning process. The only participant to not report a change in planning practices represented the ZL group. Two themes emerged during interviews that impacted teacher planning practices; time and support.

Five of eight participants reported a concern for the increased amount of time required for planning. Of this 62.5%, two participants were HL group members while the other three represented the ML, LL, and ZL groups. The two participants from the LL and ZL group reported a concern for an overwhelming amount of paperwork required to plan for UDL. Besides the increase in time required for planning many participants reported the need for a structured support from instructional coaches, consultants, and administration in order to effectively implement UDL. Three participants described their support structure as the reason for successful implementation, five participants reported an expectation from administration that teachers implement UDL, and four of the participants expressed a concern for the lack of support needed to effectively implement UDL.

In addition to results for the research questions, there were several additional findings that impacted the study: many instructional coaches (1) expressed confusion between UDL and DI, (2) reported an impact on students both instructionally and behaviorally, and (3) had concerns with the actual training experience.

Discussion of Research Findings

Research Question 1: Perceptions of UDL's Impact on Teacher Pedagogy

Individual face-to-face interviews were used to collect data on the perceptions high school instructional coaches had about the impact of UDL on teacher pedagogy. Overall, the perceptions were positive. Those participants with more training (HL and ML) reported more positive impact than those in the low and zero level groups. This is consistent with findings from Hatley (2011) who found a significant difference in teachers just starting to implement UDL when compared with teachers with more UDL experience. Teachers with more experience

considered UDL to have a greater influence on their pedagogy which was validated by classroom observations conducted by Hatley.

Two ML participants reported an ineffective training experience consequently impacting their perception of the impact of UDL on teacher pedagogy; however, as seen in Table 6, five of the eight participants reported changes in pedagogy that were directly related to UDL training. Instructional coaches were able to discuss specific differences in teacher pedagogy after participating in UDL training: (1) increased use of a variety of instructional strategies related to UDL principles and (2) a more student centered classroom. Schelley, Davies, and Spooner (2011) and Felton (2012) also reported an increase in UDL aligned instructional strategies and more student choice.

Instructional coaches reported a difference in teacher ability to plan for and implement all three principles consistently. Participants suggested Multiple Means of Representation was the easiest to implement, followed by Multiple Means of Action and Expression, and lastly Multiple Means of Engagement. Instructional strategies reported by participants were organized based on the strategies suggested for each checkpoint in the UDL framework (See Table 23). These checkpoints were organized into guiding principles (See table 24). Multiple Means of Representation represented 35.9% of the reported strategies, while multiple Means of Action and Expression represented 34.3% and the least represented principle, Multiple Means of Engagement, included only 29.8% of the strategies mentioned by participants. This was consistent with results from the 2013 study completed by Meier and was verified by statements from participants in the current study (See Table 28, 29, and 30). These results supported a need for more training in utilizing Multiple Means of Action and Expression as well as Engagement.

Instructional coaches often discussed UDL in terms of differentiated instruction (DI) as seen in Table 13. When this topic was broken down further into similarities (Table 18) and differences (Table 19) it was clear that, although the terms UDL and DI were used interchangeably, there were clear differences between the two. Participants with more training (HL and ML) described UDL as more targeted (Participant 1), student centered (Participant 2), proactive (Participant 3 and Participant 6), and an excellent resource for differentiation (Participant 8). Even the participant in the LL group described UDL as more prescribed (Participant 4).

Only Participant 5 (ZL) and Participant 7 (ML) suggested there is no difference between UDL and DI and UDL was just another name for differentiated instruction (DI). These two participants suggested there was no change in teacher pedagogy explaining that teachers were already using these practices before training. Each described a process of planning for differentiated instruction without a consideration for UDL and explained that strategies suggested by UDL are common research based strategies utilized by many teachers. They explain that even though they may suggest the strategies consistent with UDL, they would not present them as UDL strategies. This perception was also represented in the Meier (2013) study where findings indicated that teachers implement strategies supported by UDL principles, but are not intentionally calling it UDL or attempting to strategically implement UDL in classrooms. Participant 7 also reported an ineffective training experience and suggested a need for effective training in order to distinguish UDL from DI and utilize UDL as a tool for differentiation.

Instructional coaches reported a direct impact on students including increased interest, increased engagement, and improved behavior. Kumar and Wideman (2014) reported similar results suggesting students had a more positive attitude toward learning which was supported by

a statistically significant increase in student interest and engagement after implementing UDL designed lessons into classroom practice. Felton (2012) found a positive correlation between student choice and student engagement suggesting more choice results in more engagement.

Research Question 2: Perceptions of UDL's Impact on Teacher Lesson Planning Practices

The researcher facilitated individual face-to-face interviews to collect data on the high school instructional coaches' perceptions about the impact UDL had on teacher lesson planning practices. Based on results from the current study, participants considered UDL to impact the process of lesson planning (See Table 10). Many participants (75%) described a change to the lesson planning format utilized at their location. The lesson plan template was modified to include a section for UDL.

Participants discussed resources, provided by the consultant, that were used as a checklist to choose instructional strategies that would benefit all students (See Table 21). The ability to design lesson plans incorporating strategies consistent with UDL principles was noted in several other studies. Spooner, Baker, Harris, Ahligrim-Delzell, & Browder (2007) developed a lesson plan rubric for analyzing lesson plans for UDL components. Researchers indicated teachers were able to make considerable modifications to lesson plans to include UDL principles after training in UDL. Several studies used this same rubric to investigate lesson plan development. Researchers indicated the ability to design UDL lessons after training (Baldiris Navarro, Zervas, Fabregat Gesa, & Sampson, 2016; Courey, Tappe, Siker, & LePage, 2012; Goldthwait-Fowles, 2015; Winter, 2016).

Although participants agreed that planning lessons for all students improved after training, many complained about the amount of time needed to effectively plan using the UDL framework (See Table 11 and table 26). This was consistent with several other studies (Bowman,

2016; Hatley, 2011; Vitelli, 2013; Wyndham, 2010) each indicating a reluctance of teachers to incorporate the UDL framework due to the increased amount of time required to plan effectively.

Wyndham (2010) completed a statewide study of K-12 public school faculty members. This study also found a positive impact of UDL on lesson planning. Although the overall impact was positive many faculty members complained that increased time requirements and lack of on-going training made them hesitant to implement UDL. On the other hand, several participants indicated that once the activities were planned it became easier to incorporate them into future lessons (Participant 6), that the effort was worth the time (Participant 2), and that the more practice a teacher had the easier it became to utilize UDL during planning.

Like Hatley (2011), instructional coaches agreed that on-going support would be required in order to make this method of planning a practice teachers automatically incorporated (See Table 27, 28, and 29). Participants in the HL and ML groups reported individualized support for teachers during the planning process; however participants 1, 2, and 3 described a collaborative process while participants 6, 7, and 8 described a more authoritative process of checking lesson plans and then observing classes. Participants 1, 2, and 3 reported the greatest amount of impact from UDL training; whereas participants 6 and 8 described UDL as impactful but no longer the focus at their location and Participant 7 did not perceive UDL impacted teacher lesson planning. These findings indicated the format of support provided to teachers impacted the overall impact of the training.

In addition to the findings for each research question, participants also voiced opinions about training and student impact. Several participants voiced concerns over the format of the training they received (See Table 15) suggesting training should be on-going, collaborative, and include modeled instruction in order to plan and implement UDL lessons using all UDL

principles. This was also found in several previous studies (Hatley, 2011; Jordan Anstead, 2016; Wyndham, 2010) and seems to be a common perception for effective implementation. Those trained in a UDL fashion and supported after initial training by instructional coaches and consultants were among the most positively impacted. These participants made up the HL group and one participant from the ML group. Two ML participants did not have a productive training experience and, coupled with multiple initiatives at the school level, resulted in ineffective implementation and the perception that UDL made no difference in teacher pedagogy or lesson planning practices.

Many participants reported improvements to students both instructionally and behaviorally. This was consistent with findings from Wyndham (2010), Felton (2012) and Harms (2012) in which participants agreed that increasing choice increased engagement of the students, thus impacting achievement and behavior. Increasing choice is part of UDL checkpoint 7.1 Optimize individual choice and autonomy (NCUDL). Kumar and Wideman (2014) found that students in a UDL classroom reported being less stressed and more engaged. Managing stress is part of UDL checkpoint 9.2 Facilitate personal coping skills and strategies (NCUDL). These results indicated a possible correlation between UDL and improved student achievement and behavior.

Conclusions

The researcher drew the following conclusions based on findings from the current study:

1. Findings from the current study supported previous research.
2. Universal Design for Learning impacts both teacher pedagogy and lesson planning practices.

3. Respondents indicated a relationship between Universal Design for Learning and Differentiated Instruction.
4. Universal Design for Learning was impactful to students.
5. Instructional coaches perceived Universal Design for Learning was beneficial for teachers and supported the practice but did not feel supported by administration.

Implications

The researcher contributed to educational research in the field of UDL by validating findings previously found using teacher, student, and faculty perceptions. Instructional coach perceptions were not represented in the research studies found on the impact of UDL. As instructional support for teachers and developers of professional learning for the building, instructional coaches' perceptions were a missing link in the literature base that needed to be studied. The current study was found to support previous research and fills the gap in research identified by the researcher. Besides the needed viewpoint, this study also included data on what teachers and instructional coaches need for training and additional support in order to properly implement UDL as a practice.

The purpose of exploring the perceptions of instructional coaches was to determine if UDL training impacted teacher pedagogy and lesson planning practices. Instructional coaches who were trained in UDL and tasked with supporting teachers as they implement UDL into practice found UDL to be beneficial and the majority reported UDL to have impacted both teacher pedagogy and lesson planning practices. The findings supported the use of UDL as a framework for creating and implementing lessons for all students; yet, UDL is no longer a focus for professional learning in the district high schools. This needs to be reconsidered and UDL revisited as a way to increase access to instruction for all students.

Although the majority of instructional coaches noted specific changes to pedagogy, they often described UDL in terms of differentiated instruction (DI). When investigated further, the majority of participants described UDL as a more structured, targeted, and organized DI. UDL should be utilized by instructional coaches and teachers as a structured way to implement differentiated instruction into daily lesson plans. Incorporating the UDL framework allows teachers to be proactive in their differentiating and can help eliminate the need for remediation after the lesson. Support of UDL from district level leadership would enable a structured way to differentiate lessons for all district teachers.

Participants pointed out several observed changes in students after teachers started utilizing UDL in the classroom. By including practices aligned to UDL there was more student engagement and fewer behavior issues. Students were more interested and engaged in the learning, setting goals and monitoring their own progress, designing lessons and projects to increase their knowledge of major concepts, and their behavior improved as a result of the increase in engagement. More engaged students could lead to higher student achievement. Findings from this study can be used by leaders at the school and district level to determine initiatives that would support student's variance. Training was found to impact teacher practice when supported by instructional leaders. A district initiative to support UDL would impact more district schools and, as a result, students.

Instructional coaches indicated administration focus is influential to professional learning in the building. A change in administration lead to a change in focus and thus the discontinuation of UDL as a focus for professional learning (PL). Schools were also reported to be involved in multiple initiatives at one time which impacted the ability of UDL to be properly implemented in the building. Although UDL is no longer the focus for PL, 67% of district high schools still have

UDL as a part of their lesson plan template. Even though administration did not continue support of UDL it was found that instructional coaches see it as beneficial and continue to keep UDL in the forefront of lesson design. Without administrative support and continued, effective training, participants agreed that UDL would become obsolete and be considered merely a resource for the DI practice.

Beyond the scope of the research questions were further findings that influenced the perceived impact of UDL. These findings provided valuable information for instructional coaches who plan to implement UDL training. First, UDL training should be delivered in a UDL fashion. The consultant should use options for representation, action and expression, and engagement as vital parts of the training format in order to model UDL while training is conducted. Additionally, instructional coaches and teachers should work collaboratively to plan lessons and instructional coaches should model lessons for struggling teachers. Finally, support for initiatives must come from the administrative level in order to become a focus for professional learning in the building.

In summary, UDL was reported to be an effective framework to initiate changes in teacher pedagogy and lesson planning practices; however, teachers need time to participate in effective on-going training as well as time and support to design and implement lessons that incorporate the UDL principles. Support from administration is extremely important as it was found to be particularly impactful to perceptions of instructional coaches. Daily support and assistance from instructional coaches was also important to the success of UDL implementation. Instructional coaches who planned collaboratively with teachers, conducted focused observations, and provided timely constructive feedback reported the largest impact of UDL.

Research Framework

The Impact of UDL Conceptual Framework was revised to represent the findings from the study as shown as the research framework in Figure 3. Each UDL principle was previously represented as equally impactful to teacher pedagogy and lesson planning practices. Participants indicated Multiple Means of Representation was easiest to implement and 36% of all strategies reported by participants were part of the representation portion of the UDL framework. To represent this the Impact of UDL Framework was modified to represent Multiple Means of Representation in a larger, bolded font. Multiple Means of Action and Expression was found to be second easiest to implement and represented 34% of all strategies utilized. To represent this, Multiple Means of Action and Expression was represented with a bolded font, but the size was left the same. No changes were made to Multiple Means of Engagement in the research framework because it was reported to be the most difficult to implement and represented the least amount of strategies utilized. The percentage of strategies utilized was added to Figure 3 as a numerical representation of the percentage of strategies representing each portion of the UDL framework.

The Area of Impact rectangle represents areas of teacher practice impacted by UDL. Percentages were added to the rectangle to represent the percent of participants who reported a change in practice perceived to be a direct result of UDL training. A higher percentage of participants reported a change in lesson planning practices than teacher pedagogy. For this reason lesson planning practices is represented in a bold font in the research framework below.

Several barriers were reported which directly affect the impact of UDL: (1) Time, (2) Training, and (3) Support. These are represented by circles supporting the area of impact rectangle. Those trying to implement UDL should be mindful of the amount of time required

from teachers, the format of and need for ongoing training, and the level of support given to the initiative. These barriers were found to impact perceptions of the usefulness of the UDL framework and are considered by the researcher to be crucial supports to the impact of UDL.

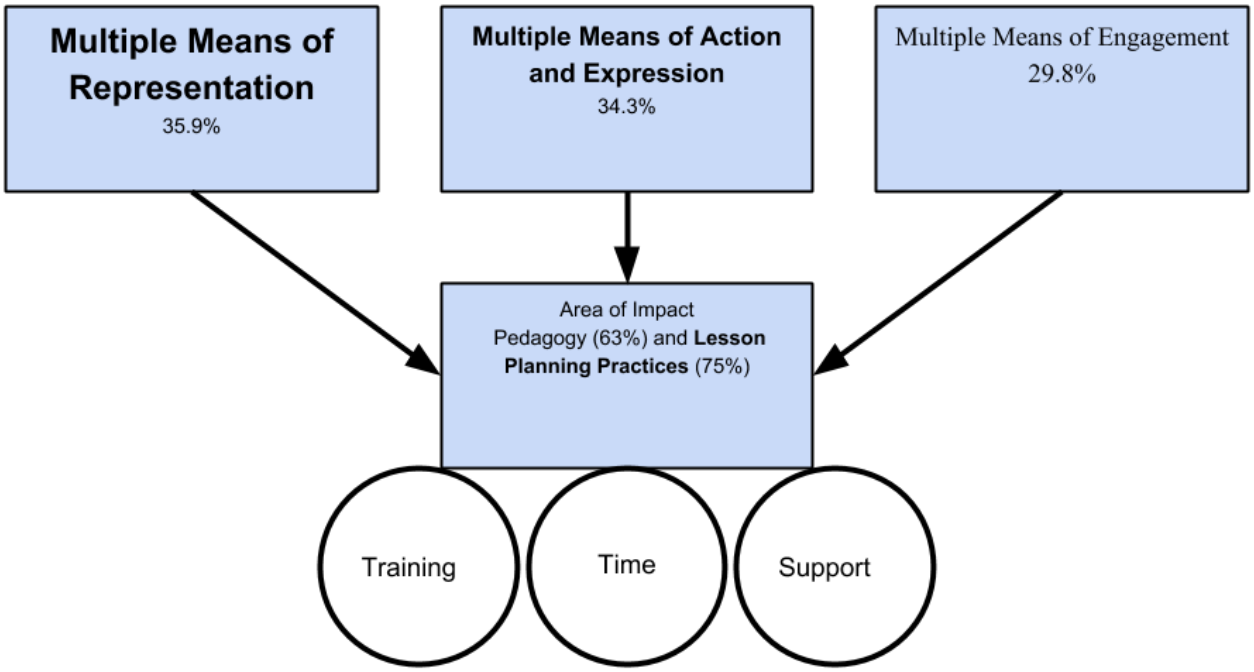

Figure 3. Research Framework

Limitations

Several factors were previously mentioned as possible areas of limitation for the study. The researcher was concerned about the ability to get people to participate in the study. As it turned out, all district high schools were represented in the study and 67% of instructional coaches volunteered to be interviewed. This is a high participation rate for the current study, but still only represents one school district in Georgia.

Additionally, the researcher was concerned about the turnover of instructional coaching staff in each school. UDL training took place over several years between 2014 and 2017. The researcher needed instructional coaches who had taken part in the training and implementation

phase of training. Of the eight participants only two were new to the position and had not been trained in UDL. One of these two had some guidance using a UDL based lesson planning template while working as a teacher in a district high school. This means 75% of the participants took part in the UDL training and were part of the support staff tasked with supporting implementation of the UDL framework.

Given these facts, the researcher does not consider the participants to be a limiting factor and considers the participants to be representative of the total population of instructional coaches in the district. Although the participants are representative of the population for the district being studied, the study represents only one school district in Georgia and this will affect the generalizability of the findings.

Recommendations

Based on analyses from the current study the researcher suggested the following recommendations:

1. Instructional leaders at the district level should consider UDL as a possible focus for professional learning.

Participants in the current study did perceive an impact of UDL on teacher pedagogy and lesson planning practices. Several participants attributed the success of the training to the format of the training as well as the administrative and instructional support provided to the teachers. Instructional coaches reported an increase in the use of instructional strategies and a lesson planning template already in place in many district high schools. Courses could be offered as a district professional learning opportunity for educators who are new to UDL as well as refresher

courses for those who have already participated in training. This would allow teachers who need help differentiating lessons to participate in these courses.

Instructional coaches and administrators could also be offered courses in UDL, but from a monitoring and support standpoint. In depth training for instructional coaches would enable them to model instructional strategies and collaboratively plan with teachers to design lessons intended to meet the needs of all learners. This would provide the required support structure for teachers as they work to implement the practice of using UDL.

2. Developers of UDL professional learning should use the data gathered during this study to develop a training format and support structure to better support teachers during the implementation process.

Participants from the current study discussed the benefits of a support structure that consisted of collaborative support, timely feedback, and ongoing professional learning. Coupled with similar findings from previous research, there is a need for restructuring the current format of professional development as it pertains to UDL. Several participants discussed a training that was not delivered in a UDL fashion and expressed a need for modeled instruction in the classroom while other participants described an expectation without follow up training or training offered to teachers new to the building. A training format that allows for presentation of material in the same manner expected with UDL followed by clear expectations and monitoring by educational leaders partnered with the consultant or trainer would be most beneficial to those learning UDL.

3. Leaders at the district level should utilize the UDL framework to develop a walkthrough form to help during observations focusing on DI.

Participants often described UDL in relation to DI; however, they also reported UDL to

be more structured and reported use of a checklist used during planning. UDL resources could be used to develop a walkthrough form district and school leaders could utilize when observing DI in the classroom.

4. Utilize the district walkthrough form to guide collaborative planning that includes teachers, instructional coaches, and administration.

Participants reported the need for a steady support structure from the instructional coaches as well as the principal. A collaborative planning structure supported at the district level would allow teachers that needed support to implement UDL. Once the district develops the walkthrough form previously discussed, the walkthrough form could be utilized during collaborative planning sessions to help choose strategies that address all three learning networks in the brain while considering the many variances in students.

Further Research

Areas of further research might include qualifications for effective UDL training, the development of a training format and protocol, development of a support plan schools could utilize when implementing UDL, and the connection between DI and UDL.

Based on the current study, the researcher suggests the following:

1. If this study is duplicated questions should be added to the interview protocol to address specific training experiences and support after training. The focus of the current study was to determine if UDL training impacted teacher pedagogy and lesson planning practices. Based on results from the study more attention should be paid to the delivery of the training and the support structure implemented to guide teachers as they implement UDL practices. Studies using a variety of perceptions: instructional coach, teacher, and student have been conducted with results that indicate UDL is beneficial for planning and implementing more diverse lessons.

Therefore teachers should be trained in UDL in a fashion that will result in the most impact on teacher pedagogy and lesson planning practices. Training and support were among the most influential components which impacted instructional coach perceptions and should be researched further.

2. Administrative support should be considered as a focus for future studies. Participants in the current study reported a discontinuation of UDL professional learning (PL) due to a change in administration itself or a change in the focus of the current administration. A look into why UDL was discontinued as a focus for PL and the impact of this change in focus on the use of UDL would benefit districts looking to implement UDL training in their district.

3. A study focusing on implementation of each individual checkpoint would be beneficial for developers of UDL professional learning. In the current study, the researcher reported strategies mentioned by instructional coaches broken down by checkpoint. Further investigation into the use of individual checkpoints would enable development of a more targeted professional learning plan. This plan could be used to ensure all UDL checkpoints are implemented equally to support all students as they learn new material.

4. Lastly, the connection between DI and UDL should be researched. The participants reported a similarity between UDL and DI, but also described UDL as more prescribed, strategic, and structured. Research into just exactly how they are related would be beneficial for leaders who complete classroom observations and must look for evidence of DI.

Dissemination.

As part of the research process the superintendent of the school district where the study took place requested a copy be provided him once the study was completed. Barbara Meier, the author of the 2013 study in which the interview protocol was based, also requested a copy once

the study was complete. The researcher planned to provide a copy to each by email using the email address utilized while requesting permission for the study.

The regional education service agencies (RESAs) host conferences each year that are intended to provide professional development to teachers in the area served by each RESA. Session proposals will be sent to RESAs outlining findings from the current study and a plan to disseminate this information to teachers and leaders in the area during conference workshops.

The researcher planned to submit the study for publication to at least three journals or newsletters. First, the UDL center posts a newsletter called the *UDL Focus.* The researcher will contact the UDL Center using the email address udlcenter@udlcenter.org to gain permission and requirements for submitting articles for publication in the newsletter.

The *International Journal of Educational Research* publishes research documents in the field of education. Using the website https://www.journals.elsevier.com/international-journal-of-educational-research, the researcher will submit a copy of the current study to the Editorial Board of the journal for review and acceptance for publication in the journal. The researcher devised a timeline of steps to follow in order to submit the completed manuscript to the journal for publication.

The researcher also planned to submit a manuscript of the study to the *Journal of Teacher Education* using the website http://journals.sagepub.com/home/jte. This website offers opportunities to submit manuscripts for publication after an internal review process. Articles must be between 20 and 50 pages, so the researcher has planned to summarize the research to accommodate the limitations set by the journal.

Concluding Thoughts

Students have been increasingly more diverse as the nation has grown since its infancy. Teacher practices have changed very little and very slowly over the years. Teachers need to be able to teach more diverse students and UDL is an organized, targeted, proactive framework to address student differences. UDL has been studied and perceptions indicated a change in pedagogy and planning after participating in UDL training. The framework is beneficial; however, it is not being used effectively due to subpar training and lack of support after training. A training and support structure that is intended to assist teachers as they implement UDL would be beneficial for professional development as it pertains to UDL.

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APPENDICES

APPENDIX A

Informed Consent for School Principals and Instructional Coaches

COLUMBUS STATE UNIVERSITY

INSTITUTIONAL REVIEW BOARD

Universal Design for Learning: Is Training Making a Difference in Teacher Pedagogy

INFORMED CONSENT INFORMATION

You are being asked to participate in a research study conducted by Michelle Sizemore, a doctoral student in the College of Education and Health Professions at Columbus State University under the supervision of Dr. Pamela Lemoine, a faculty member.

I. Purpose: The purpose of this study is to determine if instructional coaches perceive Universal Design for Learning (UDL) has impacted teacher pedagogy and lesson plan design.

II. Procedures: If you agree to be in the study, you will participate in a face to face individual interview. Summary data from this research could be used in future presentations or future research; however, no data will be used that would identify the participants.

Individual Face to Face Interview Procedures:

Individual Interviews will take approximately 30 to 45 minutes to complete. The interview will take place after school hours at a time designated by the survey participant. The face to face interviews will be recorded using an electronic device. After the interviews, a transcript of the interview will be emailed to the participant to check for accuracy.

III. Possible Risks or Discomforts: There are minimal risks when participating in the study. There is the potential loss of confidentiality, because the researcher cannot guarantee that participants will not share information from the survey or individual interviews. The researcher will take the following precautions to minimize the level of social risks by allowing participants to withdraw or limit their participation if they become uncomfortable, allowing participants to request that the audio recording be paused at any time there is a feeling of discomfort, asking participants to agree to the importance of keeping information discussed during the interview confidential.

IV. Potential Benefits: Although there are no direct benefits to the participant for being in the study, there are potential benefits to educators at the state, regional, district, and school levels.

V. Costs and Compensation: Participants will not be compensated for responding to the web-based survey or participating in an interview.

VI. Confidentiality: The researcher will ensure that participants' data remain confidential in the following manner: (1) storing confidential data in password-protected files on a password-protected device; (2) removing email and IP addresses from the raw data file; and (3) properly deleting, shredding, and disposing of all documents, reports, and electronic files with identifiable information one year after the completion of the study.

VII. Withdrawal: Participation in this research study is voluntary. You may withdraw from the study at any time.

For additional information about this research project, you may contact the Principal Investigator, Michelle Sizemore at sizemore_michelle @columbusstate.edu. If you have questions about your rights as a research participant, you may contact Columbus State University Institutional Review Board at irb@columbusstate.edu.

I have read this informed consent form and am over the age of 18 If I had any questions, they have been answered.

- ❑ I Agree
- ❑ I Disagree

Signature: _____

APPENDIX B

Interview Protocol

Instructional Coach Interview protocol

Interview Questions

Universal design for Learning: Is Training Making a Difference in Teacher Pedagogy

(adapted Meier, 2013)

Explanation of the Study and Participant Consent

Dear Participant,

My name is Michelle Sizemore, a doctoral student in the College of Education and Health Professions at Columbus State University. The supervising faculty member is Dr. Pamela Lemoine. I am conducting a research study entitled Universal Design for Learning: Is Training Making a Difference in Teacher Pedagogy. The purpose of this study is to determine if instructional coaches perceive Universal Design for Learning (UDL) has impacted teacher pedagogy and lesson plan design.

Your participation will involve voluntary assistance in a semi-structured interview. The duration of the interview will be an estimated time of 30 to 45 minutes. Your participation in this interview is voluntary. If you choose not to participate or to withdraw from the study at any time, you can do so without penalty or loss of benefit to yourself. The results of the research study may be published and summary data from this research could be used in future presentations or future research; however, no data will be used that would identify the participants.

In this research, there are no foreseeable risks to you. Although there may be no direct benefit to you, a possible benefit for your participation is to influence professional development

decisions in the district. Acquired knowledge about teaching may enhance personal and professional growth.

If you have any questions concerning the research study, please contact me at (229) 869-5293 or sizemore_michelle@columbusstate.edu

Please acknowledge your consent for participation by acknowledging agreement with the following statements.

- I am over the age of 18
- Participation is voluntary and I may decline to participate or withdraw from participation at any time without consequences.
- My identity will be kept confidential.
- I may request that my data be removed from the database before, during, or after data collection and my data will be excluded from the study.

Instructional Coach Signature: _____

Universal Design for Learning: Is Training Making a Difference in Teacher Pedagogy

Instructional Coach Interview Protocol Questions – Revised

*Have instructional coach sign the informed consent form.

1. What do you know about UDL?
    a. What is the purpose of UDL?
    b. What are the pros and cons?
    c. Would you recommend UDL to other teachers?
        i. Why or Why not?
2. What experiences have you had with UDL?
    a. How did you hear about UDL?
    b. How long have you worked with UDL?
        i. In what capacity? (teacher, coach)
    c. What is the expectation for utilizing UDL at your school?
3. Do the teachers you work with use the principles of UDL?
    a. What percent of the teachers, in the school where you work, are knowledgeable of UDL?
    b. Describe a typical classroom, at your school, where UDL principles are used.
    c. Describe how UDL impacts teacher practice.
    d. Has there been any differences you have noticed, in the classroom, that you would say are a result of implementing UDL? Instructional? Behavioral?
4. How are the guiding principles of UDL utilized in your school?

a. When your teachers present lessons to their class what are some of the strategies they use to address the diversity of the students they teach?
b. Do your teachers offer a variety of assignments? If so what types; if not, why not?
c. Do your teachers offer students a choice of materials/content/assessment? If so, which do they offer most often; if not, why not?
d. Describe processes teachers in your building use to help students be self-directed learners.

5. When planning lessons how do your teachers plan for the diversity of students in the classroom?
    a. Has there been any difference you have noticed, in lesson planning, you would say are a result of implementing UDL?
    b. How do teachers in your school utilize UDL during planning?
    c. Describe the process, teachers in your building follow, to plan for diversity of students.
    d. What is the process for collaborative planning in your school?
        i. How often?
        ii. What groups work together?

APPENDIX C

Superintendent Permission

February 8, 2018

Michelle Sizemore
3603 Castle Pines Lane
Albany, GA 31721

Dear Michelle Sizemore:

Based on my review of your proposed research project, I grant permission for you to conduct the study entitled *Universal Design for Learning: Is Training Making a Difference in Teacher Pedagogy* within the Dougherty County School System. As part of this study, I authorize you to contact district high school administrators for permission to conduct your study in their particular school, email district teachers and instructional coaches requesting permission to participate in the survey and interview portion of the study, contact interview participants to review the transcribed interview to ensure accuracy, and provide a completed copy of the dissertation if requested. I understand that the responsibilities for this organization include permission to access the district email server for the purpose of delivering survey and interview sign-up forms to high school administrators and request the links be forwarded to their faculty.

Sincerely,
[redacted]

Superintendent

Hello Ms. Sizemore,

I don't foresee any issues with the change in methodology. Please proceed.

Thanks,

[redacted]

Sent from my iPhone

> On Feb 15, 2018, at 3:18 PM, Sizemore, Michelle <MSizemore@docoschools.org> wrote:

>

> Good afternoon,

> My dissertation committee and I met this week to review the methodology for my study. It was determined that teachers will not be used for the study, only instructional coaches. The study will also involve only interviews as opposed to the survey and interview format I proposed earlier. If you foresee any issues with this process please let me know so I may discuss any perceived complications with the committee. As I have it now, I will be interviewing high school instructional coaches to gather perceptions of the impact of UDL on teacher pedagogy.

> Thank you for your time,

>

> Michelle Sizemore

> Doctoral student Columbus State University

APPENDIX D

IRB Approval

Michelle Sizemore <sizemore_michelle@columbusstate.edu>

Exempt Approval Protocol 18-086

CSU IRB <irb@columbusstate.edu> Thu, Apr 5, 2018 at 3:47 PM
To: Michelle Sizemore <sizemore_michelle@columbusstate.edu>, Pamela Lemoine <lemoine_pamela@columbusstate.edu>
Cc: CSU IRB <irb@columbusstate.edu>, Institutional Review Board <institutional_review@columbusstate.edu>

Institutional Review Board
Columbus State University

Date: 4/5/18
Protocol Number: 18-086
Protocol Title: Universal Design for Learning: Is Training Making a Difference in Teacher Pedagogy
Principal Investigator: Michelle Sizemore
Co-Principal Investigator: Pamela Lemoine

Dear Michelle Sizemore:

The Columbus State University Institutional Review Board or representative(s) has reviewed your research proposal identified above. It has been determined that the project is classified as exempt under 45 CFR 46.101(b) of the federal regulations and has been approved. You may begin your research project immediately.

Please note any changes to the protocol must be submitted in writing to the IRB before implementing the change(s). Any adverse events, unexpected problems, and/or incidents that involve risks to participants and/or others must be reported to the Institutional Review Board at irb@columbusstate.edu or (706) 507-8634.

If you have further questions, please feel free to contact the IRB.

Sincerely,

Amber Dees, IRB Coordinator

Institutional Review Board
Columbus State University